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A Micro Study of Rural Poverty Determining Factors in Afghanistan: A Case Study from Nangarhar Province

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Keyword list: poverty, income, household size, education, employment

Abstract

Poverty is defined as the inability to attain basic living standards due to insufficient funds to meet basic consumption needs. The main purpose of this study is to examine the determining factors of rural poverty in the Nangarhar province. The analysis is based on both primary and secondary data, which were collected through questionnaires distributed to households in different districts and from other relevant sources. A variety of analytical tools, such as the Binary Logistic Regression Model, Omnibus and Lemeshow Tests, were used to analyze the collected data. The Binary Logistic Regression Model was used to test for a relationship between rural poverty and various factors which could be causing this poverty in the Nangarhar province, while the Omnibus Test and Lemeshow Tests were used to determine the goodness-of-fit of the Binary Logistic Regression Models.

The results of the analysis indicate that the most significant factors affecting rural poverty in the Nangarhar province are family size, average household education and dependency ratio. Furthermore, the Omnibus Test results, which had a Chi-square value of 53.57 and are statistically significant at $P < 0.01$ level, and the Lemeshow Test with its significance level of 0.821 ($P > 0.05$), suggest that the Binary Logistic Regression Model is a good fit.

Description of Data

In light of the objective of the study and analytical approach applied, we decided to use primary data which we collected from rural households in major districts of Nangarhar (Kama, Sorkhrod, and Behsud). The data were collected using a structured questionnaire, as well as face-to-face interviews. In total, 300 rural households, spread across the mentioned districts, were interviewed for the purpose of this study.

The following steps were taken to reach our target audience:

- Kama, Sorkhrod and Behsud districts were selected due to ease of access and importance of the districts
- Villages in the districts were listed
- A list of households was prepared based on maps of these villages
- Random sampling was then carried out to target select households for interviews

Research Question/Theoretical contextualization

In theoretical literature, poverty is defined as the inability to attain basic living standards due to insufficient funds to meet basic consumption needs. Furthermore, lower living standards, violence, economic resource misuse, lack of availability of housing, lack of access to political systems, scarcity of resources, starvation, lack of basic schooling and uncertainty surrounding the near future are the most important factors determining poverty. Poverty is a multidimensional concept and has been approached in various ways by a large number of researchers. However, one commonality amongst most of these researchers is the view that poverty exists when one is unable to satisfy specific basic requirements.

In the 1990s, the United Nations Development Program set its first and third Millennium goals (MDGs) which were, “(a) the eradication of extreme hunger and poverty and (b) the promotion of gender equality and empowerment of female in the year 2015”(UNDP-Sustainable Development Goals, 2015). In 2010, the United Nations stated that 50% of the world population lives below the poverty line, determined as the cost of living at a level of \$ 1.25 a day. Lack of jobs, high levels of unemployment and economic recessions made the poor population even poorer than before. The UNDP also reported that even though some of the MDGs had been achieved through a general drop in global poverty, the global economic downturn is thought to have pushed about 64 million more individuals into poverty in 2010 alone (UNDP, 2011).

Researchers have viewed poverty in different ways due to its multidimensional concepts. Some of their studies directly focused on the factors which determine rural poverty and are therefore highly relevant to this study.

Khan et al. (2015) analyzed the relationship between socioeconomic empowerment of rural populations and household poverty. They used data which had been collected through a household survey of the rural areas to reach their conclusions. The results of the study indicated a strong negative relationship between socioeconomic empowerment factors and poverty

amongst rural households (Khan et al., 2015). Haq et al. (2012) tried to understand the determining factors of income. They used primary data from the formal sector in Bahawalpur (Pakistan). The results of the study indicated that education and socioeconomic factors are the key drivers of poverty alleviation (Haq et al., 2012).

Chaudhry (2003), carried out a study on the factors leading to household poverty within rural areas of Pakistan, using microdata which was collected from rural areas surrounding Bahawalpur city. Chaudhry's study used the income regression model and the logit regression models to understand the determinants of income (Chaudhry, 2003). Siddiqui (2001), also tried to analyze the relationship between socioeconomic factors and poverty. Her study found a strong relationship between the role of gender and poverty incidence. Furthermore, she stated that gender-based poverty can be removed by improving human capital formation and increasing women's economic involvement (Siddiqui, 2001).

Afghanistan is one of the lowest income countries in the world, with a large percentage of the population living in absolute poverty. According to World Bank statistics, only 18% of the population lives in urban, 82% in rural areas of the country (World Bank, 2018, p. 15). Agriculture is the primary source of income for most Afghan people. Its share of the country's GDP is 30%, while 60% of the whole workforce of the country is employed in this sector, generating USD1,000 per capita (Kawasaki, et al., 2012). The average rate of poverty in Afghanistan is estimated to lie around 50% and in the north of Afghanistan it is between 40% – 45% (CSO, 2017). Among the poor population, more than 80% lives in rural areas of the country.

The Afghanistan Central Statistic Organization (CSO) reports from 2018 show that an even deeper form of poverty affects around 50 percent of the Afghan population (CSO, 2018). Although economic conditions have been improving over the last few years, the country is still dependent on financial support and aid from foreign countries. Afghanistan finds itself at the bottom of the list in South Asia in terms of main social indicators and standards of living are amongst the lowest in the world. In Nangarhar, 663,455 individuals live below the poverty line, representing 38.2% of the province's total population. Furthermore, more than 75% of this population lives in rural areas and the driving force of the economy is agriculture. People are primarily working as farmers in order to finance their cost of living and seasonal changes in income are consequently significant features of poverty in this province. Based on the published data, more than 80% of the poor population lives in rural areas of the country. It is therefore important to know what leads to rural poverty by carrying out a household-based study. We tried to do exactly that in this study and

aimed to identify the factors affecting rural household poverty in the Nangarhar province of Afghanistan. Specifically, the study aimed to find an answer to the following research question:

- *What are the main determining factors of rural poverty in Nangarhar?*

To answer the above research question, the study used a simple OLS empirical model which is explained in next section.

Field Research Design/Methods of Data Analysis

Based on available literature about determining factors of rural poverty, this study tended to find the main determinants of rural poverty (case study of Nangarhar province) using a Binary Logistic Regression Model, estimated via maximum likelihood ratio. Poverty is defined as the dependent variable and takes a binary value of 0 or 1. Based on researchers' knowledge of rural poverty in Afghanistan and considering previous literature on the topic, the most relevant explanatory variables were selected for the regression model of rural poverty. These independent variables are family size, average level of education of the household, ratio of male to female household members, dependency ratio, female participation, distance of school from household, gender of household head.

The rural poverty model functional form is described as follows:

$$\mathbf{Povt} = \mathbf{f}(\mathbf{Educi}, \mathbf{MaFeRi}, \mathbf{DpnRi}, \mathbf{FeParRi}, \mathbf{SchDi}, \mathbf{GenHHi}, \mathbf{u}) \quad (1)$$

In the above functional form:

- **Povt**= Poverty of a household in binary form (0 = Household is not poor, 1= Household is poor). The poverty level is set based on international standards
- **Fsize** = Family size, in numbers
- **HHEduc** = Average level of education of the household, measured in years of education
- **MaleFemale** = Male to female ratio (ratio of males compared to females in the household)
- **Dependency**= Dependency ratio (ratio of those not in the labor force to those in the labor force)
- **FemaleParti** = Female Participation Ratio (ratio of female participation in the labor force among household members)
- **SchIDistance** = Distance of the closest school from the household, in km
- **HHGender** = Gender of the household head

Furthermore, a discrete choice model (more precisely a Binary Logistic Regression Model) was used for this study because of the nature of the dependent and independent variables (binary form of both dependent and some of the independent variables). As seen in the defined variables, some of the independent variables are in discrete form (taking a value of zero or one). However, some other independent variables are in continuous form (and do not take the zero-or-one form). Moreover, the dependent variable is also specified in dichotomous form, taking only values of zero and one.

The formal specified equation is:

$$\mathbf{Povti} = \alpha + \beta_{1i} (\mathbf{HHEduci}) + \beta_{2i} (\mathbf{MaleFemale}) + \beta_{3i} (\mathbf{Dependency}) + \beta_{4i} (\mathbf{FemaleParti}) + \beta_{5i} (\mathbf{SchDistance}) + \beta_{6i} (\mathbf{Fsize}) + \beta_{7i} (\mathbf{HHHGender}) + u_i . \quad (2)$$

In the above regression model the abbreviations are as follows:

- Povti = poverty for i^{th} household in the rural area
- α = denotes a constant term for the model
- β = denotes coefficients for each explanatory variable
- u = error term

Results

As mentioned above, 300 households in three different districts of the Nangarhar province were surveyed for the purpose of this study. The highest level of education found among the households was bachelor degree level (16 years of education). However, most households' average level of education was recorded as zero (uneducated). In ten households the head of the household was female, while the remaining 290 households had male heads.

Poverty-related figures were calculated by looking at total household income per month and considering the household size. This was then compared to the current global poverty line which was updated by the World Bank in 2015 and stands at 148.8 Afghani (USD1.90) per person per day. When a household falls below the poverty line, it is considered poor. Above the line, households are classified as not poor.

Based on the type of analysis and data, we decided to apply a Binary Logistic Regression Model to determine the impact of the factors on rural poverty incidence.

The results of the Binary Logistic Regression (with $P < 0.05$) in Table 5 show that:

The predicted Binary Logistic Regression Model of the (household poverty) = -2.408 + 0.290 Family Size(1) + 1.013 Gender of Household Head(2) – 0.068 Average of Household Education(3) – 0.218 Male to Female Ratio(4) + 1.621 Dependency Ratio(5) + 1.869 Female Participation(6) – 0.132 School Distance(7)

Table 1. Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	53.572	7	.000
	Block	53.572	7	.000
	Model	53.572	7	.000

In Table 1, the Omnibus Tests' results are shown. These have a Chi-square value of 53.57 and are statistically significant at P < 0.01 level. This suggests that the model is statistically significant because inclusion of the various factors results in a significant improvement of fit over the null model.

Table 2. Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.381	8	.821

Table 2 shows the results of the Hosmer and Lemeshow Test which indicate goodness-of-fit and have a significant level of result 0.821 (P > 0.05), suggesting that the model is a good fit to the data.

Table 3. Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	196.558 ^a	.46	.589
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.			

The model summary table (Table 3) shows the R² tests of Cox & Snell and Nagelkerke which measure the goodness-of-fit of the model. Specifically, they indicate what level of variation in

dependent variables can be explained by the predictors. In this model, R^2 ranges from 0.46 (which is the Cox & Snell R^2) to 0.589 (Nagelkerke R^2). It is important to mention that the Nagelkerke R^2 takes a value between zero and one. The interpretation of the Nagelkerke R^2 is therefore easily understandable. The Cox & Snell R^2 does not stop at a value of one though. The result of Nagelkerke $R^2 = 0.59$ shows that 59% of the variance in household poverty status is explained by the explanatory variables listed in the model.

Table 4. Classification Table^a

	Observed		Predicted		
			HH Poverty		Percentage Correct
			Not Poor	Poor	
Step 1	HH Poverty	Not Poor	7	37	15.9
		Poor	8	248	96.9
	Overall Percentage				85.0

a. The cut value is .500

The above classification table (Table 4) shows 85% correctness, indicating how correctly the observed and predicted frequencies were classified while selecting variables and preparing model for the empirical analysis.

Table 5. Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Fsize	.290	.147	3.875	1	.049	1.337
	HHHGender	1.013	.822	1.518	1	.218	2.753
	HHedu	-.068	.046	2.209	1	.013	.934
	MaleFemale	-.218	.593	.135	1	.713	.804

	Dependency	1.621	.486	11.115	1	.001	5.059
	FemaleParti	1.869	3.281	.325	1	.569	6.482
	SchIDistance	-.132	.135	.952	1	.329	.876
	Constant	-2.408	1.880	1.641	1	.200	.090
a. Variable(s) entered in step 1: Fsize, HHHGender, HHEdu, MaleFemale, Dependency, FemaleParti, SchIDistance.							

Table 5 reports the regression results. The results show that family size (Fsize), average household education (HHEdu) and dependency ratio (Dependency) all have a significant impact on household poverty status. As expected in theory, an increase in the number of household members increases the likelihood of the family being poor. Similarly, an increase in dependency ratio in the household will increase the probability that the household status is poor rather than not poor. Furthermore, as expected, an increase in average level of education in the household will help the household to get out of poverty or, in other words, higher average education increases the probability that the household will move above poverty line.

Other variables in the model, i.e. male to female ratio (MaleFemale), household head gender (HHHGender), female participation ratio (FemaleParti) and distance from the nearest school (SchIDistance) did not show statistical significance at $P > 0.05$.

Discussion and Conclusion

This study was undertaken to identify the factors which affect rural poverty in the Nangarhar province of Afghanistan. Data were collected from 300 respondents in the Behsud, Sorkhrod and Kama districts of the Nangarhar province. Data were collected in the last quarter of 2019. The study reveals that family size, average household education and dependency ratio were the most important factors affecting rural poverty. A discrete choice model (more precisely a Binary Logistic Regression Model) was used to examine the factors which can lead to rural poverty. The coefficient of multiple determinations R^2 was almost 47% and the adjusted R^2 almost 59%. The Chi-square value was 53.57 and statistically significant at $P < 0.01$ level. Rural poverty was found to be positively correlated to family size, the gender of the head of the household, dependency ratio and female participation. However, average household education, male to female ratio and school distance are negatively correlated with rural poverty. Among these seven independent

variables, only three, i.e. family size (Fsize), average household education (HHEdu) and dependency ratio (Dependency) are significant at 5%, 1% and 10% of significance level though. Based on our findings from this study, we recommended that the government controls birth rates in rural areas of the Nangarhar province by bringing awareness to families and that it creates new job opportunities for the rural population in order to reduce dependency rate. Additionally, the government should increase the number of schools for the rural population to help enhance their level of education, thereby further helping the population to work its way out of poverty.

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