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What Determines Poverty and Income in Afghanistan: A Case Study of Qaisar District in Faryab Province
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Keywords: Poverty, income, basic needs, labor force, family size, farming

Abstract

This study aims to evaluate the relationship between the level of poverty in and the amount of income generated by the rural economy, namely agriculture, in the areas studied. We used a deterministic model which has been proved robust in many similar instances. This model is based on the Cobb-Douglas production function, which is widely used to study the economics of the industrial sector. For this study 250 farmers were interviewed using a structured questionnaire.

The results of the regression analysis show that household income is positively correlated with family size, number of employed household members, area of land farmed and household savings. These correlations were significant at the 0.05 significance level. Household income is negatively correlated with the working experience of the head of the household, number of self-employed household members and the number of household members working for wages outside the household’s own land. However, these relationships are insignificant at the 0.05 significance level. The value of adjusted $R^2$ in the model shows that almost 98% of the variance or changes in household income are influenced by the independent variables considered in the study.

Description of Data

Primary data was collected from farmers via a structured questionnaire with open- and closed-ended questions. The open-ended questions were used to collect qualitative data, while the closed-ended ones were used to collect quantitative data. The questionnaire items were mainly developed based on the literature review and research objectives. The descriptive study design was chosen because it allows numerical and descriptive data to be gathered and used to assess the relationships between the considered variables.

An unbiased and representative sample of 250 farmers was interviewed. This sample size was generated by an online sample size calculator, using an estimated population of 59,000 and a confidence interval of 6.8. Furthermore, the villages were selected randomly.
Research Question/Theoretical Contextualization

Poverty is an issue which has been at the heart of development efforts by both rich and poor nations for a long time. It is a central focus of the “millennium development goals”; the first of the eight goals was to half the proportion of the world’s population living on less than 1 USD per day by 2015 (United Nations, 2017). Poverty is a multidimensional concept and has been viewed in a large number of ways by different researchers. However, a popular view seems to be that poverty exists when someone is unable to satisfy some specific basic requirements. The subject of “basic needs or requirements” is also debatable, but irrespective of how poverty is created, poverty analysis begins with the recognition of basic needs and what constitutes them, as well as the notion of deprivation. It is considered as the outcome of the relationship between the socio-political and actions that eventually results in human deprivation and the worsening of people’s living standards (Sackey, 2005). Poverty exists because people cannot finance their basic daily needs. There are many studies analyzing the impact of different economic sectors, e.g. agriculture, trade, industry, foreign investment, etc., on the reduction of poverty.

Chaudry and Mehmud (2012) studied the impact of direct foreign investment on poverty reduction in Pakistan. They used time series data from the years 1973-2003. ARDL and error correction models were used to find the long run and short run relationships between the variables. The results of the study showed that all the variables had a strong negative impact on poverty.

Piese and Lin (2003) studied the impact of agricultural growth on poverty reduction in Africa, Latin America and Asia. Pooled data from these countries was used to analyze this relationship. The results showed that agricultural growth had a negative impact on poverty.

Rizvi and Sikander (2013) looked at the effect of agricultural growth, trade openness and employment in agriculture on poverty reduction. They used time series data from 1980-2010. Cointegration and an error correction model were used to analyze the data. The results showed that all the variables considered in the study had a significant impact on poverty reduction. Furthermore, Javid et al. (2011) examined the effect of remittances on economic growth and poverty. Time series data from 1973-2010 was used. The data was analyzed with the help of the ARDL technique. The findings of this study showed that remittances affected economic growth positively and significantly, and had a strong and statistically significant impact on poverty reduction.
Torres and Soloaga (2003) examined the relationship between agricultural growth and poverty reduction in Mexico. Household data from the years 1984, 1989, 1992, 1994, 1996, 1998, 2000 and 2002 was analyzed with the help of OLS and IV regression. The results showed that poverty levels in Mexico have been declining since the late 1990’s. Several regions still had high levels of poverty, with exceptionally high levels in some rural areas, but agricultural growth negatively affected poverty levels in Mexico.

Zibaei and Bakhshodeh (2007) attempted to understand the relationship between agricultural trade openness and poverty reduction. They analyzed data from different countries using OLS regression to show that economic openness has a positive impact on income and that good institutions reduce poverty. Furthermore, Prowse and Shepher (2009) analyzed the relationship between agricultural growth and poverty with the help of panel data from 1990-2005. Their results showed that the impact of agriculture growth on income poverty spreads via prices (higher producer prices, lower food prices, higher wages).

Throughout its history, Afghanistan has been affected by economic and political shocks, as well as natural tragedies. A succession of despotic regimes and the collapse of legal governments, which gave substitute governments the opportunity to rule Afghanistan by force, has made Afghanistan a poor nation with a poor humanitarian and social situation. The level of poverty in Afghanistan is not what one would expect, because suffering from poverty is extensive and multi-dimensional. However, people in Afghanistan are not at the level of starvation due to strong support from personal and private initiatives and non-governmental bodies.

Afghanistan is one of the lowest-income countries in the world, with a large percentage of the population living in absolute poverty. Only 18% of the population live in urban areas, while 82% live in rural areas (World Bank, 2018, p. 15). Agriculture is the primary source of income for the vast majority of the population. Its share in the GDP of the country is 30%, while 60% of the whole workforce is employed in this sector with a GDP per capita of 1000 USD (Kawasaki et al., 2012). The average poverty rate in Afghanistan is estimated to be around 50%, and the poverty rate in northern Afghanistan is 40-45% (CSO, 2017). The reports published in 2018 by the Afghanistan Central Statistic Organization (CSO) show more deep poverty in the country, at around 50% of the population (CSO, 2018). Although the economic situation has progressed in the last few years, the country is still dependent on financial support and aid from foreign

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1 Gross Domestic Products
countries. Afghanistan ranks lowest of the South Asian countries on the main social indicators, and its standards of living are amongst the lowest in the world.

The determined sector of the economy in the country is agriculture, and around 80% of the population farms in order to finance their costs of living. This makes provincial and seasonal changes in income significant features of poverty in Afghanistan. As the main source of income in the country is agriculture, and as changes in income affect poverty, this study analyzes the determinants of income and poverty in Faryab province in Afghanistan. Specifically, the study attempts to answer the following important questions:

- Is there any relationship between income and poverty in the province?
- Does income from agriculture cover households’ basic needs?
- Which factors can cause changes in farmers’ income?

The study planned to test the following hypotheses:

- $H_0$ = Income from agriculture cannot cover households’ basic needs.
- $H_1$ = There is no relationship between poverty and income level.

To answer the above questions, an ordinary least squares (OLS) regression model was used along with other analytical methods, as will be explained in the following sections. This study aims to give the Afghan government and other stakeholders (e.g. the World Bank and IMF) accurate and reliable information regarding the determinants of poverty which will allow them to provide evidence-based interventions to reduce poverty in Afghanistan, especially in rural areas.

**Field Research Design/Methods of Data Analysis**

This research used primary data collected from the target population through questionnaires which gathered information on different socio-economic indicators such as income, work, family size, number of male and female family members, area of land farmed, season of work, expenditure, food, savings, assets, etc., and on the demographic characteristics of the households in the study areas.

The target population for this study was the whole community of farmers in Qaisar district in Faryab province, Afghanistan. The total population of the target area, and likewise the total number of farmers, were unknown. According to estimates by the local authorities Qaisar district has around 59,000 inhabitants and around 70% of the population are employed in various
activities in the agricultural sector. These activities include horticulture, sericulture, livestock and cereal crops.

From the total unknown population of the area, 250 individuals, all of whom were farmers and heads of families, were randomly selected for interview. Due to the physical nature of agricultural work and the male-oriented culture in the region, all interviewees were men. Therefore, there will be no consideration of gender in this study. The questionnaires obtained from the field were sorted by serial number and then checked for any mistakes, incompleteness or flaws. The data were then entered in a spreadsheet based on the variables identified during the research design.

For the analysis of the association between the level of poverty and the amount of income generated by the rural economy, namely agriculture, in the areas studied, we used a deterministic model which has been proved robust in many similar instances. This model is based on the Cobb-Douglas production function, which is widely used to study the economics of the industrial sector.

For income coverage, which is a comparison between the income and expenses of households, and the differences in the relationship between income and poverty in different regions, we used two-way ANOVA techniques.

The most commonly used Cobb-Douglas production function is:

\[ Y = AL^\beta K^\alpha \]

In the above standard model,

- \( Y \) = total production
- \( L \) = labor input
- \( K \) = capital input
- \( A \) = total factor productivity
- \( \alpha \) and \( \beta \) are the output elasticities of capital and labor respectively.

Following the theoretical concept of the Cobb-Douglas production function model, the following generalized linear model was derived for the analysis of the associations between household income (\( Y \)), capital (\( K \)), labor (\( L \)) and other socio-economic factors (\( C \)).

\[ \ln(Y) = \beta_0 + \beta_1\ln(K) + \beta_2\ln(L) + \beta_3\ln(C) + u \]
The linear relationship between total household income and capital, labor and other variables can be successfully explained with least squares techniques. To obtain the most accurate, unbiased linear estimates from this model, we applied the assumptions of Gauss-Markov to the OLS model.

Based on the modified Cobb-Douglas production function model, the following regression model was derived for the analysis of the variables under study:

\[ \ln(Y) = \beta_0 + \ln(\beta_1 HH\ head\ exp) + \ln(\beta_2 Empty) + \ln(\beta_3 FamSize) + \beta_4 HH\ Saving \\
+ \ln(\beta_5 LndSize) + \beta_6 Age + \beta_7 Working\ for\ wage + u \]

In this model,

- \( Y \) = Total income of household from all sources
- \( HH\ head\ exp \) = Household head’s working experience
- \( Empty \) = The number of family members who are employed
- \( Working\ for\ wage \) = The number of family members working for others for wages
- \( FamSize \) = Family size
- \( HH\ saving \) = Household savings
- \( LndSize \) = Area of land under agricultural cultivation
- \( Age \) = The age of the household head
- \( u \) = All other factors that may independently affect the total income of the household (error term).

**Results**

This section starts with a descriptive presentation of the data collected from 250 households with brief explanations. The descriptive analysis mainly focuses on the socio-economic variables, income, costs, loans and savings.

**Table 1: Socio-Economic Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of household (HH) head (years)</td>
<td>250</td>
<td>18</td>
<td>69</td>
<td>32.17</td>
<td>11.029</td>
</tr>
<tr>
<td>Number of family members</td>
<td>250</td>
<td>4</td>
<td>11</td>
<td>7.69</td>
<td>1.544</td>
</tr>
</tbody>
</table>
The youngest interviewee was 18 years old and the eldest 69 years old. However, the interviewer was not allowed to interview individuals under 18 years old. On average, each household had seven to eight members. The largest family participating in the survey had 11 members and the smallest had four.

The participants had at least two members of their family were employed, while the biggest families had seven members of their family were employed. The minimum years of experience of the household heads was one and the maximum 52. The interviewees were also asked about their types and sources of income.

**Table 2: Income Type and Source per year in AFN**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income from own farming</td>
<td>112</td>
<td>260,000</td>
<td>54,750</td>
<td>314,750</td>
<td>103,079.11</td>
<td>31,100.325</td>
</tr>
<tr>
<td>Remittances</td>
<td>52</td>
<td>120,000</td>
<td>27,500</td>
<td>147,500</td>
<td>64,134.62</td>
<td>25,719.474</td>
</tr>
<tr>
<td>Income from other sources</td>
<td>37</td>
<td>100,000</td>
<td>14,600</td>
<td>114,600</td>
<td>58,383.78</td>
<td>27,180.605</td>
</tr>
<tr>
<td>Annual household income</td>
<td>49</td>
<td>70,000</td>
<td>20,000</td>
<td>90,000</td>
<td>48,367.35</td>
<td>23,260.028</td>
</tr>
<tr>
<td>from paid labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total income</td>
<td>250</td>
<td>392,850</td>
<td>50,000</td>
<td>442,850</td>
<td>129,179.80</td>
<td>52,438.227</td>
</tr>
</tbody>
</table>

The targeted households financed their daily costs via income from different sources. Most of the surveyed households (112) made their living from farming, from which they gained 103,079.11 AFN per year on average. The second most important source of income was remittances, followed by paid labor. Fifty-two households had a family member who was working in another province or outside the country to help pay their living costs, and on average each family received 64,134.62 AFN per year as remittances. Furthermore, 49 households had no land to work on, but offered their labor for daily wages and were working on other people’s land to earn money.
### Table 3: Costs, Loans and Savings in AFN per year

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Sum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of basic needs</td>
<td>250</td>
<td>50,650</td>
<td>215,650</td>
<td>28,530,500</td>
<td>114,122.00</td>
<td>28,235.975</td>
</tr>
<tr>
<td>Total loans</td>
<td>250</td>
<td>0</td>
<td>100,000</td>
<td>3,580,000</td>
<td>14,320.00</td>
<td>20,781.363</td>
</tr>
<tr>
<td>Household savings in AFN</td>
<td>91</td>
<td>10,000</td>
<td>100,000</td>
<td>2,665,000</td>
<td>29,285.71</td>
<td>16,168.753</td>
</tr>
</tbody>
</table>

Other important information regarding the cost of families’ basic needs and their savings were collected. The minimum a family spends per year was 50,650 AFN, and there were also families paying four times that amount for their basic needs. Furthermore, some of the households had savings in different forms, which in the majority of cases they wanted to reserve for unforeseen situations such as illness, accidents, etc.

There is another factor which helps indicate the level of poverty: the difference between income and the cost of basic needs. The descriptive analysis shows that 84 families had a negative difference between income and costs. The most negative amount was -80,900 AFN and the least negative was -900 AFN. One hundred and sixty-six families had a positive difference between income and costs, with the smallest positive difference being 1,200 AFN and the largest 227,200 AFN.

#### Figure 1: Income and Costs Difference
As mentioned in the previous section, we designed a regression model to examine the relationship between household income and other variables, and to see how much the listed variables influenced household income.

\[
\ln(Y) = \beta_0 + \ln(\beta_1 HH head exp) + \ln(\beta_2 Empty) + \ln(\beta_3 FamSiz) + \beta_4 HH Saving
+ \ln(\beta_5 LndSiz) + \beta_6 Age + \beta_7 Working for wage + u
\]

Running the above OLS regression gave the following results.

**Table 4: Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.996</td>
<td>0.993</td>
<td>0.981</td>
<td>4,018.869</td>
</tr>
</tbody>
</table>

a. Predictors: (constant), HH savings in AFN, number of family members, number of employed members, number of members working for wages, area of land in acres, self-employed, working experience of HH head

Table 4 shows how much changes in household income are explained by changes in the independent variables like household savings, family size, number of employed individuals in the household, number of household members hired by others, area of land farmed and working experience of the household head. The value of adjusted $R^2$ shows that almost 98% of the variance or changes in household income are influenced by the independent variables, and only
2% of the changes in household income are caused by other factors which are not included in our model.

To see how effectively the model explains the dependent variable, we used the ANOVA test.

**Table 5: ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>9,170,811,438.6</td>
<td>97</td>
<td>1,310,115,919.8</td>
<td>81.115</td>
<td>0.000&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Residual</td>
<td>64,605,227.970</td>
<td>4</td>
<td>16,151,306.992</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9,235,416,666.6</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent variable: total income

b. Predictors: (constant), HH savings in AFN, number of family members, number of employed members, number of members working for wages, area of land in acres, self-employed, working experience of HH head

Table 5 shows that the regression model predicts the dependent variable (household income) significantly well. An F-value of 81.115 along with a significance of p<0.000, which is less than 0.05, indicates that overall the regression model statistically significantly predicts the outcome variable, and that it is a good fit for the data.

**Table 6: Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-22,791.025</td>
<td>27,088.368</td>
<td>-0.841</td>
<td>0.448</td>
</tr>
<tr>
<td>Working experience of HH head</td>
<td>-112.918</td>
<td>422.241</td>
<td>-0.038</td>
<td>0.267</td>
</tr>
<tr>
<td>Number of family members</td>
<td>12,568.161</td>
<td>2,209.383</td>
<td>0.362</td>
<td>5.689</td>
</tr>
<tr>
<td>Number of employed members</td>
<td>19,860.199</td>
<td>2,693.839</td>
<td>0.683</td>
<td>7.372</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>t-Statistics</td>
<td>p-value</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
<td>----------------</td>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>Self-employed</td>
<td>-20,984.351</td>
<td>3,013.144</td>
<td>-6.964</td>
<td>0.002</td>
</tr>
<tr>
<td>Number of members working for wages</td>
<td>-223.970</td>
<td>8,551.939</td>
<td>-0.026</td>
<td>0.980</td>
</tr>
<tr>
<td>Area of land in Jeribs</td>
<td>11,818.599</td>
<td>1,109.550</td>
<td>10.652</td>
<td>0.000</td>
</tr>
<tr>
<td>HH savings in AFN</td>
<td>0.609</td>
<td>0.207</td>
<td>2.939</td>
<td>0.042</td>
</tr>
</tbody>
</table>

a. Dependent variable: total income

According to the model, household income is positively correlated with family size, number of employed household members, area of land farmed and household savings. However, household income is negatively correlated with the working experience of the household head, number of self-employed household members and the number of household members working for wages outside the household’s own land. The household head’s experience and the number of individuals working for wages decrease the yearly household income, which in a way goes against logical expectations. However, in this specific case, as agriculture is the main source of household income, older individuals can do less physical work than younger ones. The p-value of this variable has an insignificant value of 0.802, so this variable does not have a significant impact on the changes in total household income. Furthermore, not many family members were working for others in this survey, and they accounted for only a small part of the total household income. Therefore, the impact of this variable is not significant.

The p-values of the coefficients of family size, number of employed individuals, number of self-employed household members, area of land farmed, and household savings show that these coefficients are significant at the 0.05 significance level.

Finally, we can briefly conclude that a one-unit increase in area of land farmed, family size, household savings or number of employed individuals will increase the yearly income of a household by 11,818.6 AFN, 12,568.1 AFN, 0.609 AFN and 19,860.1 AFN respectively. It is important to mention that we tested the age of the household head, but its p-value was insignificant and its correlation with other variables negatively influenced the whole regression.
Discussion and Conclusion

Poverty is a multidimensional concept and has been viewed in a large number of ways by different researchers. However, a popular view seems to be that poverty exists when someone is unable to satisfy some specific basic requirements. The subject of “basic needs or requirements” is also debatable, but irrespective of how poverty is created, poverty analysis begins with the recognition of basic needs and what constitutes them, as well as the notion of deprivation.

Afghanistan is one of the lowest-income countries in the world, with a large percentage of the population living in absolute poverty. Only 18% of the population live in urban areas, while 82% live in rural areas. Agriculture is the primary source of income for most people. The average rate of poverty in Afghanistan is estimated at around 50%, and the poverty rate in the north of Afghanistan is between 40% and 45%.

The determined sector of the economy in the country is agriculture, and around 80% of the population farms in order to finance their costs of living. This makes provincial and seasonal changes in income significant features of poverty in Afghanistan. As the main source of income in the country is agriculture, and as changes in income affect poverty, this study analyzed the determinants of income and poverty in Faryab province in Afghanistan. Specifically, the study ran a regression to examine the relationships between household income and household savings in AFN, family size, number of employed individuals, number of individuals working for wages, area of land farmed in acres, number of self-employed household members and working experience of the household head.

The results of the regression show that household income is positively correlated with family size, number of employed household members, area of land and household savings. However, household income is negatively correlated with working experience of the household head, number of self-employed household members and the number of household members working for wages outside the household’s own land. The household head’s experience and the number of individuals working for wages decrease yearly household income, which in a way goes against logical expectations. However, in this specific case, as agriculture is the main source of household income, older individuals can do less physical work than younger ones. The p-value of this variable has an insignificant value of 0.803, so this variable does not have a significant impact on the changes in total household income. Furthermore, not many family members were working for
others in the survey and they accounted for only a small part of the total household income. Therefore, the impact of this variable is not significant.

The p-values of the coefficients of family size, number of employed individuals, number of self-employed household members, area of land farmed and household savings show that these coefficients are significant at the 0.05 significance level.
References


