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Income Differences among the Agricultural household; A Case of Tehsil Arifwala District Pakpattan, Pakistan

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This study utilizes a detailed household survey dataset to analyze the determinants of income and poverty in Tehsil Arifwala, Punjab, Pakistan. The research identifies significant factors influencing poverty levels by examining key socioeconomic variables. The findings reveal that variables such as education, employment opportunities, access to infrastructure, and agricultural productivity have adverse and statistically significant effects on poverty, suggesting that improvements in these areas contribute to poverty reduction. Conversely, inflation is found to have a positive and significant impact on poverty, indicating that rising prices exacerbate economic hardship for vulnerable households. The study underscores the critical role of the agricultural sector in poverty alleviation, given that a large proportion of the population in Arifwala relies on farming for livelihood. Enhancing agricultural productivity through better access to credit, modern farming techniques, and market linkages could significantly reduce poverty levels. The policy implications of this research emphasize the need for targeted interventions to stabilize prices, boost agricultural output, and strengthen human capital development. The study contributes to the existing literature by providing empirical evidence on the factors driving poverty in a developing economy, offering actionable insights for poverty reduction strategies.

1. Introduction

Poverty is "a state or condition in which a person or community lacks the financial resources and essentials to enjoy a minimum standard of life and wellbeing considered acceptable in society". Poverty is pronounced deprivation in wellbeing, and comprises many dimensions. It includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity (Hussain et al., 2023). Poverty is the grave problem in Pakistan. Poverty is a worldwide problem; it has spread over time. In this research, we intend to explore new dimensions, trends, and determinants of prevailing. A vast area surrounds Arifwala. In this region, fertility is a distinction from other places, but the landless labour class suffered like other parts of the country. In our study design, we are willing to determine the factors involved in the emergence of this core problem.

Despite progress, most people are still deprived of poverty. According to a World Bank report, nearly 1/2 of the world's population — more than 3 billion people — live on less than $2.50 daily. More than 1.3 billion live in extreme poverty — less than $1.25 a day. Poverty is a common problem all over the world. Our primary concern is to evaluate this problem in the context of Arifwala's case study. Our motive is to conceive some factors that create causality for poverty and suggest ways to eliminate this vicious circle. Malik (1996) examined the detriments of poverty in rural areas of Pakistan. He collected data through a micro survey of the village of Punjab. In his research, he obtained data on the number of rural-specific and household-specific variables except landholdings. He investigated how landless farmers are entrapped in poverty and how this vicious circle of poverty is perpetuated. The study depicted the poverty sphere in remote areas using simple descriptive analysis. He suggested that non-farm income would increase, and so would avoidance from poverty.

Hashmi et al. (2008) pointed out poverty due to malnourishment, lack of shelter, unemployment, and inability to maintain a minimum living standard. He gathered data through the Pakistan rural household survey. He measured poverty head count technique considering region of residence, Ownership of assets, household size, and composition of education level of household. He concluded rural poverty's determinants using the poverty status logit model (Log odds). He suggested that agricultural growth with strategy, enhanced education rate, land redistribution, and infrastructure improvement are key roots to reducing poverty in rural areas. Khalid et al (2005) examined the determinants of poverty in Pakistan using the food poverty indicator. He took secondary data from Pakistan Economic Survey 2000-2001 report, household integrated economic survey, and Pakistan integrated household survey conducted by FBS, Government of Pakistan. He calculated poverty by using the per capita expenditure on food. He analyzed the determinants of poverty as low human capital investment, high dependency ratio, lack of protective environment, and lack of school facilities by the multinomial logit model (Iqbal et al., 2023). He concluded that a country can minimize poverty by focusing on expanding the assets of poor people. The government should enhance public spending on basic social and economic services and implement efficient public service delivery system reforms.

In 2006, Achintya suggested a method to decompose poverty using public transfers. He considered the consumption basket of individuals as a basis for measuring poverty. His findings indicated that subsidies from the public sector could alter the population's welfare profile. His descriptive analysis demonstrated that public transfers could effectively alleviate poverty. He argued that public transfers, such as subsidies, enable individuals to consume beyond their current income levels.

Amjad et al., (2022) investigated the effects of globalization on rural poverty in Pakistan. Their findings suggested that globalization played a direct role in alleviating poverty and promoting growth. They analyzed secondary time series data to assess globalization's impact on rural poverty, employing a regression model for the estimation. The research concluded that globalization's effect on rural poverty was negligible, but there was a positive correlation between agricultural production, literacy rates, and globalization regarding reducing poverty. The study recommended that authorities maximize the benefits of international trade to eradicate poverty.

2. Review of the Related Literature

Agriculture is crucial for developing nations like Pakistan; however, this sector remains underdeveloped. Saboor et al. (2006) analyzed the factors contributing to poverty and the growth of total factor productivity (TFP) in Pakistan's agriculture. The analysis utilized time series data from the Federal Bureau of Statistics (FBS) 2002, performing a trend analysis of TFP for agriculture from 1960 to 2002 using indexing methods. TFP elasticities were calculated for the medium and long-term across the entire timeline. TFP in Pakistan's agriculture sector was observed to grow at a significant rate of 2.5% from 1960 to 2002. Despite this notable growth, the benefits did not reach the impoverished. The productivity gains of the 1980s and 1990s were relatively lesser, yet poverty declined in the earlier period. He suggested that effective poverty reduction strategies should integrate TFP growth with some form of redistribution (Ran et al., 2022).

Asadullah & Khan (2024) examined the factors contributing to poverty in Pakistan by utilizing microdata from the 1998-99 rounds of the HIES and PIHS. These surveys offered extensive data regarding household income, expenditure, employment, assets, and liabilities. Asadullah estimated two models: one addressing the determinants of food poverty and another applying the basic needs approach. The study found that, on average, 40% of households were impoverished nationally. Poverty was more prevalent in rural areas, with 46% of households falling below the poverty line, compared to 41% in urban areas. Asadullah proposed that poverty alleviation could be achieved by enhancing physical and financial assets and investing in fundamental social and economic services. He also suggested reforms in the public service delivery system.

Ali et al. (2022) investigated the factors influencing poverty in Pakistan using time series data and Johansen co-integration methods on various long-term variables. The research concluded that all variables negatively and significantly impact poverty, whereas inflation positively and substantially affects poverty levels. Additionally, the study identified that agriculture plays an

insignificant role in poverty alleviation. Therefore, policies should focus on enhancing the agricultural sector to reduce poverty.

Andersson et al. (2006) investigated the factors influencing poverty in Lao PDR. They noted that since the early 1990s, Lao PDR has achieved considerable success in increasing income levels and reducing poverty. This study utilizes comprehensive household survey data to explore the factors affecting income and poverty in Lao PDR. Their findings indicated that key determinants of per capita consumption include household size, dependency ratio, education, and access to agricultural resources.

Bhatta and Sharma (2006) investigated the causes and effects of chronic and transient poverty in Nepal. They analyzed secondary data from 962 household surveys conducted during 1995-96 and 2003-04. They found that accumulating assets negatively impacted poverty levels. The study highlighted three key factors, particularly human capital and wealth. Their results indicate that, given the substantial number of transient and chronic poor, the government needs to establish specific policies to tackle both forms of poverty.

Poverty is a worldwide challenge included in the eight Millennium Development Goals (MDGs), which range from significantly reducing extreme poverty to stopping the spread of HIV/AIDS and ensuring universal primary education by the goal year of 2015. These goals were established by consensus among global nations and key development organizations (Nasrullah et al., 2023). They have spurred extraordinary efforts to address the needs of the world's most impoverished populations. The UN collaborates with governments, civil society, and other partners to maintain the momentum of the MDGs and advance an ambitious post-2015 development agenda. Identifying a problem is crucial to devising solutions. In our context, fertility and lack of opportunities hinder progress toward prosperity. Our research aims to uncover overlooked aspects of poverty and guide researchers better in understanding the causes and contributing factors within our region.

3. Data and Methodology

The population mean for the analyzed sector involves the sampling unit, the investigation area, and the investigation's time frame. In the present study, we utilized a sample of 100 individuals from the entire population of that region.

3.1 Sampling Technique

We used a simple random sampling technique to collect data in our study.

3.2 Interview Schedule

An interview schedule is a structured instrument consisting of several relevant questions, accompanied by spaces designated for recording responses. In the context of this study, we have constructed an interview schedule addressing issues related to poverty. The schedule includes both open-ended and closed-ended questions. Though the interview schedule is in English, the questions are posed to respondents in their local language. Furthermore, the questionnaire

undergoes pretesting before the formal survey is conducted. The questions from the interview schedule are posed, and the responses are systematically documented.

3.3 Data collection

Primary data is gathered from sources using a structured interview format. Each participant is interviewed with a prearranged schedule, as structured questions enhance reliability and reduce errors related to question phrasing. The complete dataset is collected randomly from 37 villages within Tehsil Arifwala.

3.4 The Model

The general function of the model is represented as follows:

Income of household = f (E, AMI, HS, Oc, LHS, Vol, PCI, VOA, Ch, CLP)

Where:

E = Education of the respondent

AMI = Average Monthly Income

HS = Household Size

Oc =Occupation of Respondents

LHS =Landholding size of Respondents

Vol =Value of Live Stock

PCI =Per Capita Income

VOA = Value of Asset

Ch =Number of Children

CLP = Child Labour Participation

To convert this general function into a regression function, we add an error term to it as given below:

$$\textbf{Income of household} = \beta_0+\beta_1 X_1+\beta_2X_{2i}+\beta_3X_{3i}+\beta_4X_{4i}+\beta_5X_{5i}+\beta_6X_{6i}+\beta_7X_{7i}+\beta_8X_{8i}+\beta_9X_{9i}+\beta_{10}X_{10i}++U_i$$

Here β's are coefficients of variables. These measures are the % change in income of the respondent due to one unit change in each variable.

4 Discussion on Results

Model summary tables display the multiple coefficient (R), which collectively quantifies the degree of linear association between the dependent variable and all independent variables. In this analysis, R=.492 indicates a 49.2% association between the respondents' income and the

independent variables considered together, which include the respondents' education, household size, occupation, landholding size, value of livestock, per capita income, value of assets, number of children, and child labor participation. In the context of multiple linear regression models, R holds limited significance. A more relevant metric is the coefficient of determination (R^2), which is crucial for assessing the goodness of fit of a regression line. In our research, a low R^2 value suggests numerous other explanatory factors.

4.1 Model Summary

Table No 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701a	.492	.383	10384.025

Table No 2: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8253414826.664	17	485494989.804	4.502	
Residual	8518410327.976	79	107827978.835	.000b	
Total	16771825154.639	96			

ANOVA stands for analysis of variance. Statistical terms are used to compare the mean of more than two populations. Econometrics often uses tools for statistical inference. Thus, here ANOVA uses the source of variation (sum of squares). In this table, there are three variations in dependent variable, such as due to regression (ESS), due to residuals (RSS), and total (TSS), with corresponding degrees of freedom.

Table No 3: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15458.769	9003.994		1.717	.090
Education for Respondents	478.754	251.404	.185	1.904	.061
Average Monthly Income	.499	.082	.895	6.124	.000
Household Size	-1710.233	608.420	-.368	-2.811	.006
Occupation of Respondents	-6014.659	2426.049	-.220	-2.479	.015

Landholding Size of Respondent	1205.552	406.539	.341	2.965	.004
Value of livestock	.013	.005	.390	2.751	.007
Per Capita Income	-2.905	.736	-.573	-3.948	.000
Value of Asset	-.035	.012	-.445	-2.856	.005
No of Children	352.986	696.877	.057	.507	.614
Child Labor Participation	-2519.720	2443.842	-.117	-1.031	.306

a**. Dependent Variable: Income of respondent**

The respondents' education, landholding size, asset value, livestock value, and average income significantly affect their income. Increased education and average household income lead to a rise in revenue, and poverty is reduced. These variables are also negatively related to poverty.

Household size, occupation of respondents, per capita income, and value of assets negatively affect respondents' income. Increasing household size increases the number of dependent persons and affects the person's income. Our study measures occupation as a categorical variable 1 for agriculture and 0 for other professions. In rural areas, most poor people relate to the agriculture sector and are highly dependent on agricultural production, which fluctuates according to seasonal shocks. Poor people are laborers and do not receive much in return for their hard work (Anjum et al., 2023). Employed persons are comparatively better off than laborers. Value of asset measure is the total asset, like tractors, trolleys, and other agricultural equipment. In rural areas, people invest in those kinds of assets, which do not contribute much to an increase in income. The number of children and child labor participation do not significantly affect income. In rural areas, most children receive small sums in return. In our study, both variables depict no participation in income.

5. Conclusion

This research explores the determinants of rural poverty in tehsil Arifwala, Dist Pakpattan. From the above results, it has been concluded that poverty strongly influences the standard of living of households in rural areas, and people are bound to live in miserable conditions. Large household size and limited livelihood activities in rural areas are significant causes of poverty prevalence. Findings show that respondents' education, average monthly income, and livestock value significantly affect income. All lead to an increase in income and ultimately decrease in poverty. Our research determines that the primary factors that strongly impact the state of poverty in rural areas are education, average monthly income, respondents' occupation, landholding size, value of livestock, per capita income, and value of assets. Malik (1996), Andersson et al., (2006) and Bhatta and Sharma (2006) showed similar determinants of poverty. In Arifwala, a surrounded village, although it consists of cultivated and fertile land, the uneven distribution of land and resources leads to most of the population living on the poverty edge. Although the labor rate is

almost 400 in our area, opportunities are comparatively better than in other areas. Still, higher dependency on the agricultural sector and lower opportunity in the industrial sector tend to lower income, and it is susceptible to these determinants.

5.1 Policy Recommendation

Research indicates that effective management of the swift population growth, particularly in rural regions, along with increased awareness of family planning initiatives, is crucial for reducing poverty. Simply constructing schools is insufficient to enhance fundamental education in rural areas; the government could consider offering stipends to children to motivate their parents to invest in education. The study highlights that basic health and housing services are essential to rural poverty reduction strategies. Due to the lack of healthcare facilities in remote rural regions, issues like high infant mortality rates and other health complications are significantly more prevalent than in urban areas. According to Nasrullah et al. (2023), the government can effectively reduce poverty and control diseases by improving healthcare services, such as setting up basic health centers with competent staff, implementing water purification systems, introducing modern sanitation, and raising awareness about fundamental health issues among rural households.

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