# EXPLORING THE SOCIO-ECONOMIC IMPACT OF LIVESTOCK ON POVERTY ALLEVIATION: A CASE STUDY OF RURAL COMMUNITIES IN DISTRICT BUNER

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## ABSTRACT

Livestock is a critical contributor to the rural economy of Pakistan, particularly in poverty alleviation. This study explores the socio-economic impact of livestock on poverty reduction in rural communities of District Buner, Khyber Pakhtunkhwa. Data was collected from 80 farmers across four tehsils through a structured questionnaire. A logit model was employed to analyze the relationship between livestock ownership and poverty alleviation. The findings reveal that income generated from livestock, other sources of income, household size, the number of animals owned, and the experience of the respondents significantly impact poverty levels. Livestock-related activities were found to boost household income, playing a pivotal role in reducing poverty among rural communities. The study concludes that livestock farming can be an effective tool for economic empowerment and poverty reduction in rural areas.

**Keywords:** Livestock, Poverty Alleviation, Rural Economy, Income Generation, District Buner.

## INTRODUCTION

Poverty remains a significant challenge worldwide, affecting millions of individuals and families. It can be broadly defined as the lack of access to essential resources such as food, water, shelter, healthcare, and education, which are necessary to maintain a minimum standard of living (Kumar, 2018). According to the World Bank, extreme poverty is characterized by living on less than $1.90 per day, a threshold that continues to affect people globally, particularly in developing nations (World Bank, 2022). In Pakistan, poverty persists as a critical issue, particularly in rural areas, where it disproportionately impacts communities reliant on agriculture and livestock for their livelihood. Understanding and addressing the root causes of poverty, including socio-economic factors, is crucial in formulating effective poverty reduction strategies.

Poverty can be categorized into several types based on its causes and impact. Absolute poverty refers to the deprivation of basic human needs such as food, clean water, and shelter. It is often more prevalent in developing countries (Kumar, 2018). Relative poverty, on the other hand, refers to a household's economic position relative to the surrounding society. It reflects income inequality, where individuals may have access to basic needs but are still unable to achieve a standard of living comparable to others in their community (Kumar, 2018). Additionally, situational poverty occurs due to external shocks such as environmental disasters or economic crises, while generational poverty is a deeper form of deprivation passed down through generations (Khan, 2019).

In Pakistan, rural poverty is particularly challenging due to limited access to education, employment, and healthcare services. According to the Planning Commission of Pakistan, approximately 21.9% of the population lives below the poverty line, with rural areas like Balochistan

and Khyber Pakhtunkhwa experiencing higher poverty rates compared to urban centers (ESP 2021-22). The agricultural sector, which employs 37.4% of Pakistan's labor force, is an essential component of the country's economy, yet its productivity remains insufficient for poverty alleviation (ESP 2021-22). In particular, livestock farming plays a vital role in the economic sustenance of rural communities, offering a source of income, employment, and nutritional food products such as milk, meat, and eggs (Ahmad et al., 1996).

The livestock sector in Pakistan contributes significantly to the country's economy, accounting for 61.9% of agricultural value-added services and 14% of the Gross Domestic Product (GDP) in 2021-22 (ESP 2021-22). With over 8 million rural households relying on livestock for 35-40% of their income, it is clear that livestock farming holds considerable potential for poverty alleviation in these communities. Livestock also contributes to Pakistan's export economy, with products such as leather being one of the country's major exports after cotton and rice (Sarwar et al., 2002).

However, the potential of the livestock sector remains underutilized due to poor marketing, inadequate access to resources, and the traditional methods of farming employed by many small-scale farmers in rural areas (Muhammad Ishaq & Abdul Hassan, 2016). In Khyber Pakhtunkhwa, where the focus of this research is located, livestock farming serves as a crucial income source and provides critical support for the livelihood of rural households. The province accounts for a significant share of Pakistan's milk, beef, mutton, wool, and hide production (Livestock Census, 1996). However, despite its contribution to the local and national economy, the livestock sector in Khyber Pakhtunkhwa is still largely underdeveloped and hampered by inefficient distribution and marketing systems.

This research aims to explore the socio-economic impact of livestock farming on poverty alleviation in District Buner, a rural area in Khyber Pakhtunkhwa. By examining the contribution of livestock to household income and overall economic well-being, this study seeks to identify the ways in which livestock farming can be leveraged as a tool for poverty reduction. Understanding the challenges faced by rural communities in Buner, such as market access and

resource limitations, will provide valuable insights into the development of effective policies and programs to support the rural livestock sector and improve the livelihoods of impoverished families in the region.

## Literature Reviews

The role of livestock in alleviating poverty and improving livelihoods in rural areas has been widely studied, highlighting its significance in economic development. Khan et al. (2015) examined how livestock contributed to poverty reduction in the Lasbela district of Baluchistan. Using a structured questionnaire to gather data from 100 farmers, the study found that 58% of the farmers relied on livestock as their primary income source, while 29% considered it secondary. The use of the Ordinary Least Square (OLS) method revealed that factors such as high-yielding animals, milk prices, access to new technologies, infrastructure, credit availability, and healthcare for animals significantly impacted household incomes. This study emphasized the critical role of livestock in improving farmers' economic conditions.

Similarly, Zahid Mahmood et al. (2014) explored the importance of livestock in rural Pakistan, particularly its impact on food security. The study utilized data from various reports, including the Food Insecurity Report 2009, Punjab Development Statistics 2009, and the Agriculture Census Report 2010. Employing a generalized linear model, the researchers found a positive correlation between food security and the number of working and milk-producing animals. This research further underscored the essential role livestock plays in securing livelihoods and ensuring food availability in rural areas.

Khan et al. (2019) extended this discussion to Jhal Magsi in Baluchistan, where livestock was shown to be a primary means of income and food security for rural households. Surveying 200 families, the study highlighted the dependence of small farmers on livestock to meet basic necessities and improve their living standards. However, challenges such as traditional practices, lack of veterinary services, and inadequate financial resources were identified as hindrances to productivity. The study recommended government interventions to improve farmers' access to necessary resources,

which could reduce poverty and malnutrition in rural regions.

Alvi et al. (2015) focused on the potential of livestock to uplift the livelihoods of small-scale farmers in the Subdistrict of Jaranwala, Faisalabad. Through interviews with 120 livestock producers, the study found that over 22% of respondents earned a maximum income of more than Rs. 15,000 from small-scale livestock farming. However, the research also noted that the lack of awareness and adoption of advanced livestock farming techniques resulted in lower productivity. Recommendations included improving access to veterinary services and training farmers in livestock management to boost productivity and household income.

Garcia et al. (2003) evaluated the economics of dairy farming in Pakistan, particularly among small-scale farmers in Punjab. By analyzing different farm types, the study suggested that reducing farm production costs, increasing productivity, and ensuring a greater share of consumer milk prices for farmers were essential strategies for improving the livelihoods of small dairy producers. This research further reinforced the need for targeted interventions to support small-scale farmers and increase their market competitiveness.

Blench et al. (2003) examined the inclusion of livestock in Poverty Reduction Strategy Papers (PRSPs) from countries like Pakistan, Niger, Ethiopia, and Mozambique. The study revealed that despite the vital role livestock plays in poverty alleviation, the sector is often overlooked in national poverty reduction strategies. It recommended that policymakers better recognize livestock's contribution to poverty eradication and include more comprehensive livestock-related measures in their PRSPs.

In another study, Khan et al. (2018) reiterated the significance of livestock in supporting rural households in Lasbela, Baluchistan. Surveying 100 livestock farmers, the research found that small-scale farmers heavily relied on livestock for income and basic needs. However, the study identified barriers such as outdated practices and limited veterinary services, and suggested that government intervention could alleviate poverty and improve living standards in underdeveloped areas.

Hayat et al. (2019) investigated the relationship between agricultural growth and poverty reduction in Pakistan. The study found that agricultural expansion, particularly in sectors such as livestock, fisheries, and forestry, significantly impacted poverty levels. Using the OLS method, the researchers recommended a long-term agricultural growth strategy that aligned with the country's overall economic development goals to reduce poverty and enhance economic growth.

Lastly, Javed et al. (2021) and Rauf et al. (2019) further emphasized the importance of poverty reduction strategies such as the "Ehsaas" social safety net program and the Billion Trees Afforestation Program (BTAP). Both studies highlighted how these initiatives contributed to improving livelihoods and reducing poverty, particularly through livestock-related activities, asset generation, and environmental conservation.

The reviewed literature underscores the critical role of livestock in alleviating poverty, improving food security, and enhancing rural livelihoods in Pakistan. Various studies highlight the need for government interventions, financial resources, veterinary services, and agricultural training to improve livestock productivity and support small-scale farmers in rural areas.

## Methodology

The methodology for this research on the socio-economic impact of livestock on poverty alleviation in rural communities of District Buner is designed using an exploratory and explanatory approach. The study focuses on households engaged in livestock activities and utilizes a quantitative research method to collect and analyze data. The research was conducted over four months in District Buner, which is divided into six tehsils. Buner is a predominantly rural area where the majority of the population relies on agriculture and livestock for their livelihood.

The research is based on primary data collection, where a structured questionnaire was developed to gather information from respondents. The questionnaire captured demographic details, the number of livestock owned, income generated from livestock, and other income sources. A non-probability snowball sampling technique was used to identify and approach respondents due to the lack of a formal database on households involved in livestock activities. This method was effective in locating relevant households through referrals from initial participants. A total of 80 respondents

completed the survey, providing comprehensive insights into their economic conditions and livestock practices.

The empirical model used in this study assesses the relationship between various independent variables, such as income from livestock (LIEL), other income (LOI), household members (HHM), number of animals (NOA), education (Edu), and experience (Exp), and the dependent variable, poverty status (PS). The poverty status is defined based on a threshold income of $1.90 per day, with respondents classified as poor or non-poor. This research aims to fill the gap in existing literature by focusing on the impact of livestock on poverty reduction in District Buner, an area where such studies are lacking.

**FINDING AND DISCUSSION**

This section focuses on the data analysis for the study. Initially, the data will be evaluated using summary statistics, followed by a regression analysis. The outcomes of the analysis are presented in the subsequent sections.

**Descriptive                                  Analysis:**

The descriptive analysis provides an overview of the dataset's characteristics. To explore these characteristics, the study utilizes measures such as the mean, median, mode, maximum, minimum, and standard deviation. These statistical tools help to summarize the data effectively. The results from this analysis are discussed in the following sections.

**TABLE 1. DESCRIPTIVE STATISTICS AND ANALYSIS**

| | N | MEAN | MEDIAN | MODE | MINIMUM | MAXIMUM | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|
| Age of Respondent | 80 | 43.0 | 45 | 45 | 22 | 70 | 11.3 |
| Family Size | 80 | 10.6 | 9.5 | 8 | 3 | 30 | 5.1 |
| Experience of Respondent | 80 | 18.8 | 18 | 25 | 5 | 40 | 9.3 |
| Education of Respondent | 80 | 5.2 | 5 | 0 | 0 | 14 | 4.7 |
| Income Earned from Livestock | 80 | 757037.5 | 348700 | 120000 | 45000 | 10540000 | 1495399 |
| Other income | 80 | 411525 | 207500 | 190000 | 0 | 9000000 | 1023752 |
| Total Number of Animals | 80 | 5.05 | 3.5 | 2 | 1 | 41 | 5.8 |
| No. of Male involved in Livestock | 80 | 1.35 | 1 | 1 | 0 | 6 | 0.10 |
| No. of Female involved in Livestock | 80 | 0.85 | 1 | 1 | 0 | 3 | 0.6 |
| Number of Animal Sells | 80 | 5.4 | 2 | 2 | 1 | 80 | 11.5 |
| Number of Buffaloes | 80 | 1.72 | 1 | 0 | 0 | 15 | 2.4 |
| Numbers of Bulls | 80 | 0.18 | 0 | 0 | 0 | 5 | 0.79 |
| Number of Cattle/Cows | 80 | 1.82 | 1.5 | 0 | 0 | 8 | 1.99 |
| Number of Sheep | 80 | 0.56 | 0 | 0 | 0 | 25 | 0.39 |
| Number of Goats | 80 | 0.71 | 0 | 0 | 0 | 10 | 1.75 |

**Age of the respondent:**
The mean of the age of the respondent is 43 years which implies that most of the respondents were adults while the median and mode is 45 this shows that the midpoint or 50% of the respondents were adults. The minimum is 22 which implies that some of the respondents were young while the maximum is 70 which shows that some of the respondents were old age. The standard deviation of the age of the respondents is 11.3.

**Family size:**
The mean of the family is 10.6 which shows that most the families are consist of at least 10 members. The median of the family size 9.5 which implies that 50% of the households are consisting of 9 members while the median is 8 members in few families. The minimum 3 shows a nuclear family while the maximum 30 shows joint family system. The standard deviation for the family size is 5.1.

**Experience of the respondent:**
The mean and median of the experience of the respondents is 18.8/18 which shows that most of the respondents have at least 18 years of experience regarding livestock. The mode 25 shows that the respondents have 25 years of experience. Minimum 5 years shows that respondents have at least 5 years of experience while the maximum 40 shows that these respondents have all the information regarding livestock. The standard deviation for experience of the respondents is 9.3.

**Respondent Education:**
The mean of the education of the respondent is 5.2 shows the years of education they have which implies that most of the respondents are less educated and doesn't have proper learning or writing skills. The median and mode 5/0 shows the midpoint that 50% of the respondents has barely complete their primary education. The minimum and maximum 14 indicates that almost every 2ⁿᵈ respondent were literate and has educational skills while at the same time they have also more years of experience in livestock. The standard deviation of the experience of the respondents is 4.7.

**Income earned from livestock:**
The mean of the income earned from livestock is 757037.5 which shows that the households who have livestock has earned this amount from it. The median 348700 shows that almost 50% of the households have earned this amount from livestock while the mode 120000 shows that households have earned 120000 from livestock. The minimum 45000 shows the lesser amount earned from livestock while maximum 10540000 shows that this huge amount has been earned from livestock by households. The standard deviation for the income earned from livestock is 1495399.

**Other income:**
The mean of the other income is 411525 which shows that the households that have livestock are also earning this amount of money from other sources. The median and mode 207500/190000 shows that the midpoint or 50% of the households are getting this amount of money from other resources separately from livestock. The minimum income of the households is 0 while the maximum is 9000000. The standard deviation for other income is 1023752.

**Total number of animals:**
The total number of animals households own are 5.05 implies that each household have at least 5 animal which includes bull, buffalo, cow, goat and sheep. The median and mode 3.5/2 implies that households have either 3 or 2 animals in their house from which they are earning and getting benefited by as well. The minimum is 1 while the maximum is 41 which shows that this huge number of animals belong to a single household. The standard deviation for the numbers of animals is 5.8.

**No. of male involved in livestock:**
The mean of the number of males involved in livestock is 1.35 which shows that from each household at least 1 male member is involved in livestock. The median and mode are 1. The minimum number of males involved in livestock per household in livestock is 0 while the maximum is 6 which shows that households have more member involved in livestock, they take care of their animals, feed them or took care of their medical issues as well. The livestock are more productive as compared to the local low wages' jobs. The standard deviation of the number of males involved in livestock is 0.10.

**No of Female involved in livestock:**
The mean of the number of females involved in livestock is 0.85 which shows that each household has at least 1 female involved in livestock. The median and mode are 1. The minimum number of females involved in livestock per household is 0 while the maximum is 3 which shows that the households is keep benefiting from livestock and its production that female pays even more attention to their animals and take care of all its needs and medical issues. The standard deviation of the number of females involved in livestock is 0.6.

**No of animal sells:**
The mean of the number of animal sells is 5.4 which shows that the household has sold at least 5 of their animals for several purposes. The median and mode both are 2 which shows that 50% of the respondents have almost 2 animals in their livestock which they have sold. The minimum number of animal sells is 1 while maximum 80 shows that households have sold this huge number of animals for their own purposes. The standard deviation of the number of animals sells is 11.5.

**Number of Buffaloes:**
The mean of the number of buffalos in livestock per household is 1.72 shows that each house has 1 buffalo in their livestock. The median is 1 while mode is 0 showing that 50% of the respondents own a buffalo in their livestock. The minimum number of buffalo in livestock is 0 while maximum is 15 implies that households have 15 buffalos in their livestock. The standard deviation is 2.4.

**Number of Bulls:**
The mean of the number of bulls in livestock per household is 0.18 shows that some of the households have 1 bull in their livestock. The median and mode showing that 50% of the respondents does not own a bull in their livestock. The minimum number of bulls in livestock is 0 while maximum is 5 implies that households have 5 bulls in their livestock. The standard deviation is 0.79.

**Number of Cattle/Cows:**
The mean of the number of cattle/cows in livestock per household are 1.82 which shows that some of the households have 1 cow in their livestock. The median and mode 1.5/0 showing that 50% of the respondents own only 1 cow in their livestock. The minimum number of cows in livestock is 0 while maximum is 8, implies that households have 8 cows in their livestock as cows are more productive than bulls. The standard deviation is 1.99.

**Number of Sheep:**
The mean of the number of sheep in livestock per household is 0.56 shows that some of the households have only 1or 0 sheep in their livestock. The median and mode 0 showing that 50% of the respondents does not own sheep in their livestock. The minimum number of sheep in livestock is 0 while maximum is 25, implies that households have 25 sheep in their livestock which indicates the nomadic societies that have this number of goats or sheep as their asset. The standard deviation is 0.39.

**No of Goats:**
The mean of the number of goats in livestock is 0.71 which shows that most of the households does not have goat in their livestock. The median and mode both are 0 implies that 50% or even more of the respondents doesn't own goat. The minimum 0 and maximum 10 shows that few of the households have at least 10 goats in their livestock. The standard deviation for the number of goats in livestock in 1.75.

**Estimated Model**:
$$PS = \beta 0 + \beta 2LIEL + \beta 2LOI + \beta 3HHM + \beta 4NOA + \beta 5Edu + \beta 6Exp + \mu$$

*TABLE 2. SUMMARY STATISTICS OF LOGIT MODEL AND MARGINAL EFFECTS BY CONSIDERING POVERTY STATUS AS DEPENDENT VARIABLE.*

| Logit Model | | | Marginal effects | | | |
|---|---|---|---|---|---|---|
| Variables | Coefficients | Std. Err. | Z | dy/dx | Std. Err. | Z |
| *LIEL* | -3.663296** | 1.499645 | -2.44 | -.1763021*** | .0553431 | -3.19 |
| *LOI* | -3.829646 | 2.46386 | -1.55 | -.184308* | .1130014 | -1.63 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *HHM* | 0.790824** | .3463441 | 2.28 | .0380595*** | .0137961 | 2.76 |
| *NOA* | -.335208* | .1750994 | -1.91 | -.0161324** | .0075811 | -2.13 |
| *Edu* | .128286 | .1498005 | 0.86 | .006174 | .0069355 | 0.89 |
| *Exp* | -.1366557* | .0789189 | -1.73 | -.0065768* | .0034536 | -1.90 |

***Significant at 1% level of significance
** Significant at 5% level of significance
* Significant at 10% level of significance

The "**odds ratio**" is a common interpretation of the logit coefficient that is more intuitive (particularly for dummy independent variables). Then we take marginal effects of independent variable so that we can interpret or explain percentage change in dependent variable due to independent variable.
PS is the dependent variable which means Poverty Status. In the current model, the log of income earned from livestock have a significant effect on poverty status, LIEL negatively affect PS and if one unit change occurs in (LIEL) independent variable it will cause 17 percent change in dependent variable (-.1763021***) which means the level of significance is 1%. The log of other income also negatively affects PS and have significant effect on (-.184308*). The household members positively affect PS and have significant effect on PS (.0380595***). The number of animals in households negatively affect PS and have significant effect on PS (-.0161324**). The Education level of the respondents positively affect PS and it has no significant effect on PS (.006174). The Experience of the respondents negatively affect PS and it have significant effect on PS (-.0065768*).

**Conclusion**
This research aimed to explore the socio-economic impact of livestock on poverty alleviation in rural communities of District Buner. The findings from the data analysis indicate that livestock plays a significant role in enhancing the livelihood of rural households, contributing to income generation, food security, and overall economic stability. In Buner, where agriculture and livestock are the primary sources of livelihood, income from livestock has shown to be a critical factor in reducing poverty. Families involved in livestock activities reported substantial benefits, including increased household income and a reduction in their dependency on other limited financial resources.

The study underscores that livestock ownership, coupled with experience in livestock management, significantly improves the economic status of households. Variables such as education, household size, and the number of livestock also influence the financial outcomes of rural families. The regression analysis supports the hypothesis that income earned from livestock positively affects poverty reduction, suggesting that targeted interventions in this sector could further enhance its impact on rural livelihoods.
Furthermore, the research fills a critical gap by focusing on Buner, a region often overlooked in previous studies on poverty alleviation through livestock. The results highlight the importance of this sector in regions where alternative income sources are limited. By addressing the socio-economic benefits of livestock, the study provides insights for policymakers and development agencies to implement strategies that support livestock development and empower rural communities economically. promoting livestock as a sustainable economic activity can significantly alleviate poverty in rural areas like Buner. Future policies should focus on improving livestock management practices, providing financial support, and increasing access to markets, which would further enhance the sector's contribution to poverty reduction and economic development.

**Recommendations**
Based on the findings of this research, several recommendations can be made to enhance the role of livestock in poverty alleviation in rural communities like those in District Buner. First and foremost, there is a need for comprehensive training programs focused on improving livestock management practices. Many households in Buner lack formal education and technical skills related to livestock care, breeding, and health management. By providing farmers with training in modern animal husbandry techniques, disease control, and

sustainable feeding practices, productivity could increase, leading to higher incomes and a more sustainable livelihood for rural families. Government agencies and non-governmental organizations should collaborate to deliver these training programs, ensuring they reach the most vulnerable households.

Another key recommendation is the expansion of access to financial resources for farmers engaged in livestock activities. Limited access to credit and financial services has been a major constraint for small-scale livestock owners in Buner. By establishing microfinance programs tailored to the needs of livestock farmers, families can invest in better breeds, veterinary care, and improved infrastructure such as shelters for animals. This financial support would enable farmers to scale up their operations, increase productivity, and diversify income sources. Additionally, such programs should include affordable insurance schemes to protect livestock farmers from potential losses due to diseases or natural calamities.

Improving market access is also essential for maximizing the economic benefits of livestock. Many livestock owners in Buner face challenges in selling their products, whether it be animals, milk, or meat, due to poor transportation networks and a lack of organized markets. The government should invest in developing better infrastructure, such as roads and communication networks, and establish local livestock markets to provide farmers with direct access to buyers. Moreover, facilitating the creation of cooperatives can help small-scale farmers pool their resources, negotiate better prices, and access larger markets.

Lastly, the government should prioritize policies that support livestock development as part of a broader rural development strategy. This includes enhancing veterinary services, ensuring the availability of affordable fodder, and promoting sustainable livestock practices that align with environmental conservation efforts. Policymakers should also consider integrating livestock-related programs with other poverty alleviation efforts, such as agriculture, education, and health services, to create a holistic approach to rural development.

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