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Impact of Institutional Credit Granted by Zarai Taraqiati Bank Limited on Farmers' Livestock Outcomes in District Dir Upper, Khyber Pakhtunkhwa

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ABSTRACT

The present study was conducted in District Dir Upper, KP. The primary objective was to examine the impact of credit granted by ZTBL on farmers' livestock outcomes. A purposive sampling technique was used to select Dir Upper from 36 districts in the province of KP, followed by three tehsils— Dir, Barawal, and Sheringal— within Dir Upper. A total of 230 respondents who utilized ZTBL credit for livestock rearing were selected. An interview schedule was applied to collect cross-sectional data from sampled farmers. Data were analyzed with a paired t-statistic. The findings indicated that ZTBL credit has significant impact on livestock outcomes of the farmers in the study area. The ZTBL credit led to enhance livestock number and its productivity, the self-consumption and sale of milk, and farmers' income. It is recommended that ZTBL should introduce interest-free credit program through Islamic financing, follow simple collateral policy, and modernize the credit application process to facilitate farmers' access to credit. Additionally, the study also recommends that ZTBL should expand its local branches to provide better support to farmers and help boost their livestock outcomes.

Keywords: *ZTBL Credit, Livestock Productivity, Number of Livestock, Farmers' Income, Dir Upper*

INTRODUCTION

Livestock sector is a vital component of Pakistan's agricultural sector. It accounts for 63.6% to the value added in agriculture and 14.97% to the country's GDP, and contributes 2.9% to the total exports (Ali, 2025). Livestock plays a significant role for rural communities in Pakistan. It is estimated that about 30-35 million people are engaged in livestock production, deriving 30 to 40% of their income from this sector, of which 34% are poor. The women primarily engage in management activities, while the men are generally involved in market activities. (Umm-e-Zia et al., 2011). In Pakistan, the livestock sector comprises a diverse range of animals including buffalo, cattle, camels, goats, sheep, asses, horses and mules (Rehman et al., 2017). In 2024, the total estimated livestock population in Pakistan is 251.3 million. The majority of which are goats, accounting for about 55.9 million (38%), followed by cattle with 55.9 million (22%), buffaloes with 47.7 million (19%), sheep with 44.6 million (18%), asses with 4.9 million (2%), camels with 1.5 million (0.6%), horses with 0.55 million (0.2%), mules with 0.3 million (0.1%), and yak with 0.002 million (0.002%). Overall, Punjab is the province with the highest number of

animals, accounting for 104.2 million, followed by Sindh with 49.9 million, KP with 84.7 million, Balochistan with about 47.9 million, and Islamabad with 0.36 million (Pakistan Bureau of Statistics, 2024).

In 2023–24, livestock is estimated to annually produce 70,071 thousand tonnes of milk, of which 56,474 thousand tonnes are available for human consumption. In overall milk production, the largest share comes from buffaloes (about 60%), followed by cows (37%), goats (2%), camels (1%), and a small amount from sheep. Livestock is estimated to annually provide 2,647 thousand tonnes of meat, including 2,630 thousand tonnes of beef and 817 thousand tonnes of mutton (GOP, 2024). Livestock is also considered a crucial source of food, providing important products such as meat, milk, butter, oil, yogurt, and significantly contributes to the health, food security, and well-being of populations in both urban and rural areas (Chaudhry et al., 1999). It also provides raw materials for industries such as carpets, leather, shoes, and pharmaceuticals. It creates markets for feed, veterinary services, and other related industries, stimulating economic activity in rural areas. Livestock can also serve as a form of capital for farmers, providing a valuable asset that can be used as collateral for loans or sold when needed (Afzal & Naqvi, 2004).

District Dir Upper is predominantly mountainous, and the majority of its population lives in rural areas relying on agriculture. It is known as a crucial livelihood activity, providing employment to almost 46% of the workforce. The people in the district are engaged in growing crops, fruits, and rearing livestock. Wheat, maize, rice, rapeseed, and mustard are the main crops grown in the majority of the area. Additionally, onions, horticultural produce (fruits, vegetables) are also grown in a considerable proportion of the cultivated area for both own and commercial purposes. Livestock husbandry is also an essential part of the people's economy, contributing to employment and income generation. In the district, livestock mostly consists of goats and cattle, while sheep, buffaloes, horses, and asses are also reared for domestic and commercial purposes (PPAF, 2014).

Livestock also contribute significantly to milk, meat, manure, carriage, as well as creating of cash income through sale of animals. Many families consume dairy products for their personal use and sell the surplus, while others depend only on livestock for their income, selling both dairy products and animals without holding any for personal consumption. Though the people in the district obtain the major portion of their income from livestock, financial issues often hamper and restrict farmers' ability to finance livestock activities. To address such constraints, agricultural credit, especially from Zarai Taraqiati Bank Limited (ZTBL), is known as an important source for the growth of the livestock sector. By providing access to ZTBL credit, farmers are in a position to increase their livestock operations by investing in quality animals and feeding practices, veterinary services, and modern equipment. This, in turn, results in better quality animals and products, enhances productivity and sales, and ultimately increases income for farmers. Building on this understanding, the current study aims to investigate the influence of credit granted by ZTBL on farmers' livestock outcomes in Dir Upper with the following research hypothesis.

Hypothesis

To determine the association between ZTBL credit and the livestock outcome, the following hypothesis was made.

There is no statistically significant difference in the mean livestock outcomes before and following credit use. (H_0: $\mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$)

LITERATURE REVIEW

This section presents a summary of existing literature and highlights the gap that the study seeks to address.

Khan et al. (2007) reported the impact of credit received from ZTBL in the District of Karak, Pakistan. The authors collected data through standardized questionnaires from 75 farmers. Descriptive statistics such as percentage analysis was used for comparison purposes. The results indicated an increase in crop output, animals, and the income of farmers.

Khan (2007) conducted a study in Abbottabad, Pakistan, to investigate the influence of microcredit on livestock enterprise development. In the study area, 60 farming households received credit for livestock development; however, only 30 of them utilized it for its intended purpose. The majority of these farmers reported that microcredit had a positive effect on livestock development, which subsequently improved their socioeconomic conditions. It was observed that microcredit increased household income, food consumption, and the education of their children.

Abedullah et al. (2009) conducted a study in District Faisalabad, Pakistan, to investigate the effects of institutional credit on the growth of the livestock sector. In the research area, 50 farmers participated in data collection. A multiple linear regression model was applied to assess the association between credit and income from milking animals. The results revealed a 160% increase in milking animals and a 181% increase in household income.

Mohsin et al. (2011) investigated a study in Punjab, Pakistan, to examine the impact of supervised agricultural credit on farm income. An interview schedule was used to gather data from 80 respondents. The findings showed that credit positively and significantly influenced the number of livestock, production, and farmers' income. The credit led to enhancing the total livestock by 20%, milk productivity by 78%, and income from livestock by 78.48%.

Abdul-Moomin (2012) conducted a study in Ghana to assess the microcredit obtained from a livestock development project and its relationship with the livestock productivity of smallholders. Various sampling techniques such as stratified random sampling along with simple random sampling and purposive sampling were applied for sample selection. The collection of data was based on questionnaires and field observations. For data analysis, descriptive and inferential statistics were applied. The study found that microcredit has a positive effect on livestock productivity.

Iqbal et al. (2012) conducted a study in Swat, Pakistan, to determine the effect of ZTBL loans on the number of livestock and farmers' income in the livestock sector. A structured questionnaire was used to collect data from 80 farmers engaged in livestock. The t-test compared the mean value of the number of livestock and farmers' income before and after credit utilization. Findings showed that credit from ZTBL increased the number of livestock by 31% and the farmers' income by 23%.

In the rural regions of District Mardan, Pakistan, a study was by Khan and Khan (2014) regarding the influence of ZTBL loan on the production of milch cows. The study consisted of 107 farmers from whom data were collected through interview schedules. The collected data were analyzed with a paired t-test. The study results showed that the credit led to an increase in average expenses and the average earnings per animal after loan utilization.

Kuye (2015) described the influence of microloans on livestock productivity in Nigeria. A purposive and random sampling technique was employed to gather data from 150 livestock farmers. Both descriptive and inferential statistics were employed for data analysis. The results revealed that microloans had a positive and significant impact on livestock productivity.

Khan et al. (2018) explored the effect of ZTBL loans on income in the livestock sector in District Lasbela, Sindh province of Pakistan. Structured questionnaires were employed to gather data from 100 farmers. The results indicated that ZTBL loans contributed positively and significantly to the growth of the livestock husbandry, resulting to a significant 65% rise in farmers' income.

Ahmad et al. (2022) explored the effect of institutional finance on livestock outcomes in Punjab province, Pakistan. Data were collected from 240 families engaged in livestock farming, and multiple regression analysis was applied. The results found that institutional credit led to enhancing the income of households by almost 24%, the herd size of animals by 49%, and the total number of milking animals by about 40%.

Ahmad and Ahmad (2024) conducted a study in District Dir Lower, Pakistan, to estimate the influence of credit provided by ZTBL on farmers' income engaged in the livestock farming. A multistage sampling technique was used for sample selection. Data were collected from 298 farmers through questionnaires and interviews. The multiple linear regression approach was used for data analysis. The findings indicate that credit had positively and significantly affected farmers' income engaged in the livestock sector.

The above discussion indicates a positive and significant effect of institutional loans on livestock farming and outcomes for farmers globally, including in Pakistan. Institutional credit, especially from ZTBL, is critical for supporting farmers in Pakistan, including those in District Dir Upper. ZTBL in Dir Upper provides credit for agricultural purposes, including livestock activities, enabling farming communities to finance their livestock projects effectively. However, the specific impact of ZTBL credit has not been explored before in District Dir Upper. To our knowledge, no quantitative study has analyzed the impact of ZTBL credit on livestock outcomes. This study aims to address the research gap by offering vigorous evidence on how ZTBL credit affects livestock outcomes in the study area. This study adds some new knowledge to the existing literature that has never or rarely been explored before.

MATERIALS AND METHODS

This section highlights the study area, sampling technique, sample size determination, data source and collection method, and data analysis.

Study Area

This research was conducted in District Dir Upper, situated in the province of Khyber Pakhtunkhwa (KP), Pakistan. Administratively, District Dir Upper consists of six tehsils—Dir, Sheringal, Wari. Barawal, Kalkot, and Larjam. It has an area an area of 3699 square kilometer and has a total population of 1.048 million, with a population density of about 293 persons per square kilometer. The annual population growth is recorded at 2.27% (GOP, 2023).

Sampling Technique and Sample Size Determination

The study employed a two-stage sampling technique. In the first stage, District Dir Upper was selected using convenience sampling from among all districts of KP. In the second stage, three tehsils—Barawal, Dir, and Sheringal—were purposively chosen based on consultation with ZTBL officials in Dir Upper. The total population of credit beneficiaries in these tehsils included 925 farmers who had obtained credit from ZTBL for agricultural activities, of which 322 received it specifically for livestock purposes. A list of these 322 livestock farmers was acquired from the ZTBL branch in Dir Upper. During the first interaction with the farmers, it was revealed that 250 had utilized the credit for its intended requirements, whereas 72 had diverted it to non-livestock purposes. The study specifically focused on the borrowers who had utilized their credit for livestock purposes, while those who utilized it for other requirements were not considered, and this group served as the sample size. Table 1 outlined the details of the sample size across tehsils.

Table 1: ***Respondents' Distribution across Tehsils in the Study Area***

Tehsils	Total credit beneficiaries	Livestock credit beneficiaries	Sampled beneficiaries
Barawal	295	95	84
Dir	340	125	92
Sheringal	290	102	74
Total	925	322	250

Note. Source: ZTBL Dir Upper, 2022

Data Source and Collection Method

The present study utilized primary data which were collected from sampled farmers (respondents) who received loans in the study area, which served as the source of data. An interview schedule was the tool employed to gather data from these farmers. The data collection period spanned from 2022-24. The collected data include credit amount, obstacles encountered by obtaining loans, livestock numbers and its productivity, utilization of livestock products for personal and commercial uses, and farmers' income from livestock before and after loan utilization.

Data Analysis

The data were analyzed using SPSS. Descriptive statistics was used, where frequencies and percentages were calculated to summarize the data. Inferential statistics such as t-test was applied to find significant differences in the research variables and test the hypothesis. The t-test is given as under.

$$t = \frac{\bar{d}}{sd/\sqrt{n}}$$

Where:

t = t-test

$\bar{d}$= Mean differences before and after credit

sd = Standard deviation of the differences.

n = Sample size (No. of paired farmers).

RESULTS AND DISCUSSION

This section describes the obstacles faced by farmers while obtaining loans, the size of credit amount, and the effects of credit on livestock outcomes. The details are presented below.

Obstacles encountered by farmers in obtaining credit

The respondents in the research area were asked whether they faced obstacles in obtaining credit from ZTBL. The majority of them faced obstacles, while in contrast, some reported that they encountered no obstacles. Table 2 illustrated the data as under.

Table 2: ***Distribution of Respondents by Obstacles Encountered in Obtaining Credit***

Tehsils	No Obstacle		High Collateral Requirements		Distant Bank Location		Complex credit procedure	
	f	%	*F*	%	*f*	%	*f*	%
Barawal	20	6	32	10	25	8	18	6
Dir	23	7	45	14	30	9	27	8
Sheringal	18	6	34	11	22	7	28	9
Total	61	19	111	34	77	24	73	23

Note. Source: Field Survey, 2022-24

Table 2 shows that the majority of respondents, accounting for 111 (34%), faced high collateral requirements, followed by 77 (24%) who reported distant bank locations, and 73 (23%) encountered complex credit procedures, while 61 (19%) respondents reported no obstacles. In high collateral requirements, the major number was 45 (14%) in Tehsil Dir, followed by 34 (11%) in Tehsil Sheringal, and 32 (10%) in Tehsil Barawal. In distant bank locations, the major number was 30 (9%) in Tehsil Dir, followed by 25 (8%) in Barawal, and 22 (7%) in Tehsil Sheringal. In complex credit procedures, the major part of respondents was 28 (9%) in Tehsil Sheringal, followed by 27 (8%) in Tehsil Dir, and 18 (6%) in Tehsil Barawal. For respondents who faced no obstacles, the biggest proportion was 23 (7%) in Tehsil Dir, followed by 20 (6%) in Tehsil Barawal, and 18 (6%) in Tehsil Sheringal.

Access to credit from institutions such as ZTBL can help farmers expand their operations, boost their productivity, and increase income in the livestock sector (Abedullah et al., 2009; Mohsin et al., 2011). Currently, the farmers in the study area avoid interest-based credit, hindering their access to necessary funds. Introducing Islamic finance in agriculture can promote sustainable growth while adhering to Islamic principles. To facilitate this, ZTBL bank should introduce an interest-free loan scheme based on Islamic partnership models such as Musharaka and Mudaraba. Furthermore, ZTBL should revise collateral requirements, simplify credit procedures, and establish new branches in the study areas to assist farmers in increasing their livestock outcomes. These recommendations align with the findings of Ahmad and Ahmad, (2024).

Credit Amount of Respondents

In Pakistan, currently, there are 46 formal financial institutions granting agricultural credits to the farmers. These institutions consist of 5 major commercial banks, 13 medium-sized domestic private banks, 6 Islamic banks, 2 specialized banks (ZTBL and Punjab Provincial Cooperative Bank Limited), and 11 microfinance banks, along with 9 Microfinance Institutions/Rural Support Programs (MFIs/RSPs). During Fiscal Year 2023 (July-March), the agriculture funding institutions disbursed PKR 1221.9 billion, which is 67.2% of the annual target and 27.5% higher than the disbursement of PKR 958.3 billion during the same period last year. ZTBL disbursed PKR 47.1 billion, accounting for 3.85% of the total credit disbursed, which is 0.2% higher than the disbursement of PKR 47 billion during the same period last year (GOP, 2023). The ZTBL branch in Dir Upper is a formal financial institution that provides credit to farmers for financing agricultural activities, including livestock. During the period 2018–2020, it disbursed credit to farmers, and the details credit amount received by farmers are displayed in of Table 3.

Table 3: ***Respondents' Distribution Based on Credit Amount (PKR, '000)***

Tehsils	Up to 400		401-600		Above 600	
	f	%	*f*	%	*f*	%
Barawal	32	10	52	16	30	9
Dir	35	11	48	15	24	7
Sheringal	29	9	45	14	27	8
Total	96	30	145	45	81	25

Note. Source: Field Survey, 2022-24

Table 3 indicates that the majority of respondents, accounting for 145 (45%), borrowed from PKR 401-600 thousand. This was followed by 96 respondents (30%) who borrowed up to PKR 400 thousand, and 81 respondents (25%) who borrowed above PKR 600 thousand. In PKR 401-600 thousand, the highest number was 52 respondents (16%) in Tehsil Barawal, followed by 48 respondents (15%) in Tehsil Dir, and 45 respondents (14%) in Tehsil Sheringal. In terms of above PKR 600 thousand, the major share was 30 respondents (9%) in Tehsil Barawal, followed by 27 respondents (8%) in Tehsil Sheringal, and 24 respondents (7%) in Tehsil Dir. Regarding up to PKR 400 thousand, the major proportion was 35 respondents (11%) in Tehsil Dir, followed by 32 respondents (10%) in Tehsil Barawal, and 29 respondents (9%) in Tehsil Sheringal. Overall, the table indicates that the majority of respondents (80%) obtained credit amounts up to 600 thousand, which is insufficient for farmers' requirements. ZTBL should increase credit provision to support farmers improving their operations in the livestock sector and enhance their outcomes.

Impact of Credit on Livestock Holdings

In Pakistan, the average household owns from 2 to 4 large animals such as cow and buffaloes and 3 to 4 small animals such as goat and sheep (GOP, 2007). In research area, the respondents were asked about the number of livestock they keep, and details of the average numbers of animals are illustrated in Table 4.

Table 4: ***Impact of Credit on Livestock Holdings per Farmer***

Tehsils	Before credit	After credit	% change	t	p
Barawal	4	7	75	12.77	0.000
Dir	3	5	67	11.39	0.000
Sheringal	5	9	80	9.47	0.000
Average	4	7	75		

Note. Source: Field Survey, 2022-24

Table 4 shows the impact of credit on average livestock holdings before and following credit, with percentage change, t-statistic, and probability (p-value). Since, the hypothesis test is based on p-value, the p-value is considered, while t-value is not considered. The results exhibit that the average livestock holdings across all tehsils rose from 4 to 7 per farmer, signifying a 75% increase after credit utilization. The highest increase was recorded in Tehsil Sheringal, where the average livestock holdings increased from 5 to 9 per farmer, showing an 80% increase. This was followed by Tehsil Barawal, where the average livestock holdings increased from 4 to 7 per farmer, revealing a 75% increase after credit utilization. In Tehsil Dir, the average livestock holdings increased from 3 to 5 per farmer, implying a 67% increase. The p-values for all tehsils were 0.000 ($p<0.05$), indicating that credit significantly affected the animals in the research area. These findings are align with the results of Khan et al. (2007), Khan et al. (2007), Abedullah et al. (2009), Mohsin (2011), Iqbal et al. (2011), and Ahmad et al. (2022), who also reported that credit significantly contributes to an increase in livestock holdings.

Impact of Credit on Milk Productivity

Milk productivity refers to the annual output of large animals, such as cows and buffaloes, in the research area. First, the average annual milk productivity per animal was calculated, and then average milk productivity across all tehsils was obtained, and the details are outlined in Table 5.

Table 5: ***Impact of Credit on Average Annual Milk Productivity per Animal (in kg)***

Tehsils	Before credit	After credit	% change	t	p
Barawal	3736	5571	49	11.07	0.000
Dir	4204	6561	56	12.83	0.000
Sheringal	4004	6049	51	11.69	0.000
Average	3981	6060	52		

Note. Source: Field Survey, 2022-24

Table 5 shows the impact of credit on average annual milk productivity per animal (kg) before and after credit, percentage change, along with p-value. The average presents the mean productivity across all tehsils. The results depict that the average productivity before credit was 3981 kg per animal, which increased to 6060 kg after credit utilization, showing a 52% increase. The maximum change was observed in Tehsil Dir, where the average productivity before credit was 4204 kg per animal, which increased to 6561 kg after credit utilization, indicating a 56% increase. This was followed by Tehsil Sheringal, where the average productivity increased from 4004 kg to 6049 kg per animal, revealing a 51% increase. In Tehsil Barawal, the average productivity increased from 3736 kg to 5571 kg per animal, indicating a 49% increase. The p-values across all tehsils were 0.000, which is less than significance level of 0.05 ($p < 0.05$), showing that the effect of ZTBL credit on milk productivity is statistically significant. These findings are consistent with the studies of Mohsin et al., (2011), Abdul-Moomin (2012), Kuye (2015), Ahmad (2019), and Ahmad et al. (2022), who have also stated that credit significantly contributes to an increase in livestock productivity.

Impact of Credit on Self-Consumption of Milk Productivity

Milk productivity that farmers receive from their livestock is used for various purposes, including self-consumption. The respondents were asked about their self-consumption of milk productivity before and following the use of credit. Table 6 outlined the details.

Table 6: ***Impact of Credit on Self-Consumption of Milk Productivity per Animal (in kg)***

Tehsils	Before credit	After credit	% change	t	p
Barawal	1095	1663	52	3.46	0.000
Dir	1280	2026	58	4.68	0.000
Sheringal	1140	1696	49	3.40	0.001
Average	1172	1795	53		

Note. Source: Field Survey, 2022-24

Table 6 shows the impact of credit on the average annual self-consumption of milk productivity per animal (kg) in different tehsils. As shown in Table 6, the average self-consumption of milk productivity per animal improved from 1172 kg to 1795 kg per animal, revealing a 53% increase. The highest increase was recorded in tehsil Dir, where the self-consumption of milk productivity increased from 1280 kg to 2026 kg per animal, signifying a 58% increase. This was followed by tehsil Barawal, where the self-consumption of milk productivity increased from 1095 kg to 1663 kg per animal, showing a 52% increase. The self-consumption of milk productivity also increased from 1140 kg to 1696 kg per animal with a 49% increase in Tehsil Sheringal. The p-values across all tehsils were 0.000, 0.000, and 0.001 in

Tehsils Barawal, Dir, and Sheringal respectively ($p < 0.05$), indicating that the impact of ZTBL credit on self-consumption of milk is statistically significant. Our findings are aligned with the findings of Ahmad (2019), which also reported a significant improvement in self-consumption of milk output following credit use. These findings are also in line with the study of Ravindran et al. (2007), who recorded similar results showing a positive relationship between milk output and milk consumption.

Impact of Credit on Milk Sales

Besides personal uses, the surplus milk sold for commercial purposes. Respondents were interviewed regarding the milk sales prior to and following the use of credit, and the details are exhibited in Table 7.

Table 7: ***Impact of Credit on Annual Average Milk Sales per Animal (in kg)***

Tehsils	Before credit	After credit	% change	t	p
Barawal	2641	3909	49	5.35	0.000
Dir	2924	4535	55	8.71	0.000
Sheringal	2864	4353	52	5.99	0.000
Average	2810	4266	52		

Note. Source: Field Survey, 2022-24

Table 7 reveals the impact of credit on average annual milk sales per animal (kg) in different tehsils. It is evident in Table 7 that the average milk sales per animal improved from 2810 kg to 4266 kg per animal, a 52% increase. The highest improvement was reported in tehsil Dir, where the milk sales increased from 2924 kg to 4535 kg per animal, reflecting a 55% increase. This was followed by tehsil Sheringal, where the milk sales increased from 2864 kg to 4353 kg per animal, revealing a 52% increase. In tehsil Barawal, the milk sales per animal increased from 2641 kg to 3909 kg per animal, a 49% increase. The p-values across all tehsils were 0.000 ($p < 0.05$), implying that the impact of ZTBL credit on milk sales is statistically significant. These findings are in line with the research of Ahmad (2019), which also noted a significant rise in milk sales following credit utilization.

Impact of Credit on Farmers' Income

In the research area, the surplus milk is used for commercial purposes. Additionally, farmers sell animals and other livestock products. The income they receive over the course of a year is referred to as their annual income. The sampled farmers were interviewed regarding their annual income prior to and following the utilization of credit. Table 8 depicted the details as follows.

Table 8: ***Impact of credit on average annual income per farmer (in '000s)***

Tehsils	Before credit	After credit	% change	t	p
Barawal	382	559	46	2.86	0.005
Dir	421	641	52	3.81	0.000
Sheringal	404	595	47	3.16	0.002
Average	402	598	49		

Note. Source: Field Survey, 2022-24

Table 8 displays the impact of credit on average annual income per farmer in thousand PKR across various tehsils. The results indicate that the average annual income increased from PKR 402 to PKR 598 thousand per farmer, a 49% increase. The highest increase was reported in tehsil Dir, where the average income increased from PKR 421 to PKR 641 thousand per farmer, revealing a 52% increase. This was followed by tehsil Sheringal, where the average income increased from PKR 404 to PKR 595 thousand per farmer, showing a 47% increase. In tehsil Barawal, the average income per farmer increased from

PKR 382 to PKR 559, a 46% increase. The p-values across all tehsils were 0.005, 0.000, AND 0.002 respectively ($p < 0.05$), suggesting that the impact of ZTBL credit on income of farmer is statistically significant. Khan et al. (2007), Abedullah et al. (2009), and Mohsin (2011) also found that credit has significantly increased the number of livestock. Similar findings were presented by Iqbal et al. (2012), who observed a positive and significant increase in the number of livestock. Furthermore, Khan (2019) noted a significant increase in the number of livestock holdings following after credit utilization.

CONCLUSIONS AND RECOMMENDATIONS

Livestock is crucial sub-sector of Pakistan's agricultural economy. It contributes to national economy and provides employment to a significant portion of workforce, including District Dir Upper. Livestock is used both for domestic as well as commercial purposes; however, limited financial resources hinder farmers' ability to enhance their outcomes in livestock sector. ZTBL, as a formal financial institution, provides financial assistance to farmers. The present study assesses the impact of institutional credit granted by ZTBL on farmers' livestock outcomes in District Dir Upper. The findings show that credit has a significant impact on livestock outcomes. Based on the findings and discussion, the following recommendations are proposed:

- ZTBL needs to provide a satisfactory loan amount to farmers to help them finance their livestock operations, thereby enhancing livestock outcomes.
- ZTBL needs to initiate an interest-free loan scheme based on Islamic finance to support livestock farmers enhance their productivity and income in the livestock sector.
- ZTBL should adjust and revise the collateral policy to help livestock farmers increase their productivity and income in the livestock sector.
- ZTBL should simplify and make credit procedures more flexible to promote farmers' access to credit, thereby improving their livestock outcomes.
- ZTBL should increase its services by launching new branches to offer easy access to livestock farmers, enabling them to utilize credit and improve their outcomes in the livestock sector.

Delimitations

The present study was examined in District Dir Upper, which limits the generalizability of the results to other areas nationally and internationally. The study collected cross sectional data for two years, not capturing the long term influences of institutional credit. Furthermore, the study focused only livestock farmers who received credit from ZTBL, excluding other formal financial institutions. These limitations were set to preserve the feasibility of the present study, but they limit the breadth and scope of the findings.

FUTURE DIRECTIONS

In the future, the researchers should include various districts across the province to broaden the scope the findings. They are recommended to use longitudinal data to capture the long-term impact of institutional loans on farmers' productivity and income in the livestock sector. Furthermore, conducting comparative studies across various financial institutions could contribute to deeper and meaningful knowledge into the effectiveness of diverse credit sources. Additionally, future research should incorporate factors like extension services, supervised teams, trainings, and market access to better explain variations in livestock production and income.

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