

**IBN HALDUN UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
DEPARTMENT OF FINANCIAL ECONOMICS**

**MASTER THESIS**

**IMPACT OF MICROLOANS ON AGRICULTURAL  
PRODUCTION: A CASE STUDY OF WHEAT  
PRODUCTION IN BAHAWALPUR, PAKISTAN**

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**THESIS SUPERVISOR  
ASST. PROF. NİHAT GÜMÜŞ**

**ISTANBUL, 2022**

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**by**

**MUHAMMAD BAQIR**

**A thesis submitted to the School of Graduate Studies in partial  
fulfillment of the requirements for the degree of Master of Science in  
Financial Economics**

**THESIS SUPERVISOR  
ASST. PROF. NİHAT GÜMÜŞ**

**ISTANBUL, 2022**

APPROVAL PAGE

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Financial Economics.

Thesis Jury Members

Title - Name Surname	Opinion	Signature
_____	_____	_____
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_____	_____	_____

This is to confirm that this thesis complies with all the standards set by the School of Graduate Studies of IbnHaldun University.

Date of Submission


Seal/Signature

## ACADEMIC HONESTY ATTESTATION

I with this declare that all information in this document has been obtained and presented by academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name Surname: Muhammad Baqir

Signature:



## ÖZ

### MİKRO KREDİLERİN TARIMSAL ÜRETİME ETKİSİ: PAKİSTAN, BAHAWALPUR'DA BUĞDAY ÜRETİMİ ÜZERİNE BİR VAKA ÇALIŞMASI

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Bu çalışma, Zarei Taraqati Bank'ın teknoloji adaptasyonu amacıyla sağladığı finansmanın Pakistan'ın Bahawalpur kentindeki buğday verimliliği üzerindeki rolünü araştırmayı amaçlamaktadır. Kaynak ve teknoloji eksikliği, birçok az gelişmiş ekonominin, özellikle de genellikle başlıca gelir kaynağı tarım olan ülkelerin potansiyellerini gerçekleştirilememelerinin ana nedenidir. Bu çalışma, saha araştırması yoluyla toplanan birincil veri kaynağına dayanmaktadır. Basit rastgele örnekleme ve küme rastgele örnekleme tekniği, arazi sahipliği ve çiftçi eğitimi sabit tutularak, yanıt değişkeni ve odak değişkenler arasındaki ilişkiyi belirlemek amacıyla popülasyondan temsili örneklem elde etmek için kullanılmıştır. Yüksek verimli çeşitler, gübre, traktör ve biçerdöverler yoluyla tarım finansmanının buğday verimliliği üzerinde önemli bir etkisi olduğu sonucuna varılmıştır. Uzun vadeli krediler de buğday verimliliği üzerinde belirgin bir etki yaratırken, hane halkı büyüklüğü ve eğitim buğday verimliliği ile negatif ilişkilidir, ancak bu değişkenler önemsizdir. Uzun vadeli krediler ile tarımsal verimlilik arasındaki pozitif ilişki, kredinin çiftçilerin üstün kaliteli girdi ve ekipman satın almasını sağladığını ve bunun da tarımsal verimde artışa neden olduğunu göstermektedir. Çalışma, çiftçilere uygun miktarda kredi ve aynı kredinin (örneğin gübre, traktör vb.) zamanında sağlanmasının verimliliği artırabileceğini göstermektedir. Sonuç olarak, çiftçilerin gelirleri ve varlıkları da artmaktadır.

**Anahtar Kelimeler:** Az Gelişmiş, Ekonomiler, Mikrofinans, Refah, Tarımsal Kalkınma, ZTBL.

## ABSTRACT

### IMPACT OF MICRO LOANS ON AGRICULTURAL PRODUCTION: A CASE STUDY OF WHEAT PRODUCTION IN BAHAWALPUR, PAKISTAN

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This study aims to explore the role of Zarai Taraqati Bank's limited finance through technology adaptation on wheat productivity in Bahawalpur, Pakistan. Lack of resources and technology is why many underdeveloped economies cannot fulfil their potential, especially in agriculture, which is generally the prime income source and occupation. This study is based on a primary data source collected through a field survey. Simple random sampling and cluster random sampling techniques are employed for deriving a representative sample from the population to establish the relationship response variable and focus variables while controlling for land holdings and farmer education. It is concluded that agriculture financing through high-yielding varieties, fertilizer, tractors, and harvesters significantly impacts wheat productivity. Long-term loans also markedly affected wheat productivity, while the household size and education are negatively associated with wheat productivity, but these variables are insignificant. The positive relationship between long-term credit and agricultural productivity suggests that credit allows farmers to procure better-quality inputs and equipment, which increases agricultural productivity. The study shows that timely delivery of sufficient praise and in-kind glory (e.g., fertilizer, tractors, etc.) to farmers can increase productivity. As a result, the income and assets of the farmers are also enhanced.

**Keywords:** Agricultural Development, Microfinance, Underdeveloped Economies, Welfare, ZTBL.

## DEDICATION

This thesis is dedicated to my dear father, Nisar Hussain, who always gave special attention to my education and supported me throughout my journey. I would like to dedicate this thesis, especially to my dear mother, Malika Batool, who has always been my inspiration and source of motivation. Furthermore, I would also like to dedicate this thesis to all my siblings, relatives, and dear friends.



## ACKNOWLEDGEMENT

*“Be grateful to those who help you as it is a blessing that nourishes the spirit  
andenriches the soul” - Pakistani Proverb*

*“If your arm is too short of giving a reward, keep your tongue long enough to  
express gratitude.” Abbas Bassam*

Firstly, I would like to thank Allah Almighty, who has always blessed me with the strength and knowledge to navigate the hardships in life. I want to thank Dr. Nihat GÜMÜŞ for his help, insightful analysis, and unwavering support. I am particularly indebted to Tabish Ali and Syed Saad Mustafa for their assistance in analyzing the data and shaping this academic endeavour into its current form. Finally, I am thankful to all those who have prayed and helped me in the completion of my Master's degree.

Muhammad Baqir

ISTANBUL, 2022

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## LIST OF SYMBOLS AND ABBREVIATIONS

ADBP	Agricultural Development Bank of Pakistan
ADFC	Agricultural Development Finance Corporation
AIS	Artificial Insemination Services
ARDL	Autoregressive Distributed Lag
BCUP	Borga Chashi Unnayan Prakalpa
CB	Credit Beneficiaries
COC	Co-operative Credit
D.I.Khan	Dera Ismail Khan
DMS	Deposit Management System
EMT	Effective Microbes Technology
F-EDU	Farmer Education
FOs	Financial organizations
FYM	Farm Yard Waste Loans
GDP	Gross Domestic Product
HYV	High Yielding Varieties of Seed
IAD	Internal Audit Division
IAFS	Internal Audit Facilitation System
ICRM	Internal Credit Risk Management System
KB (FB)	Kisan Banking (Farmer Banking)
KPK	Khyber Pakhtunkhwa
LAN	Local Area Network
LDCs	Lower Divisional Clerks
LOTL	Long-Term Loan
LPS	Loan Processing System
MFL	Micro Finance Loans
MIS	Management Information System
MTO	Management Trainee Officer
NGOs	Non-Governmental Organizations
NWFP	North West Frontier Province of Pakistan
OCD	Overall Credit Disbursement
ODA	Official Development Aid
OLS	Ordinary Least Squares

PDDC	Pakistan Dairy Development Company
PEGP	Pakistan's Economy and Growth Plan
PS	Problem statement
RCE	Randomized Controlled Experiment
RFI	Rural Financial Institution
SBP	State Bank of Pakistan
SS & PS	Slack Season and Peak Season
TL	Taccavi Loans
UBL	United Bank Limited
VECM	Vector Error Correction Model
WAN	Wide Area Network
WB	World Bank
WTO	World Trade Organization
ZTBL	ZaraiTaraqiati Bank Limited

# CHAPTER I

## INTRODUCTION

The principal idea of the economic development theory is to explain why some economies are growing faster than others; why some economies gain rapid growth and enjoy good living standards while others are underdeveloped. The answer resides in the stages of development and the obstacles they face. Even though some of these obstacles are political and sociological, economic constraints are the most significant ones. In the early phases of a nation's development, progress can only be achieved by creating a surplus in agricultural production beyond basic needs. The economy cannot run without surplus, savings, capital, and food to feed the workforce involved in diverse activities Thirlwall et Al. (2011).

Agricultural development is one of the critical determinants of economic prosperity in other sectors. Agriculture contributes to economic growth in three ways, namely, contribution to the production of basic needs, creating labour force and capital for different industries, and generating foreign reserves via foreign trade.

In addition to providing basic needs within a society, agriculture contributes to the factor market through labour and capital creation. Labour for industrial activities and other activities comes from the agricultural sector. According to the Lewis development model, surplus created in agriculture to feed labour in other sectors significantly contributes to economic development. The agricultural sector also accounts for savings leading to capital accommodation for industrial expansion and development. The agriculture sector is also the primary source of government revenues through taxation of the agrarian sector and the final products sold in product markets Thirlwall et Al. (2011). Finally, agriculture generates reserves and foreign currency for a country through exports enabling the importing of goods and services needed but not being sufficiently produced within a country.

Agriculture plays a significant role in economic growth, yet several impediments to agricultural development exist. Low productivity, emphasis on industrialization, and urban biases are the main barriers to agricultural development. Low productivity is one of the major reasons why some countries are less developed in terms of agriculture as compared to others. In addition, there are certain pro-industrialization biased policies that hinder agricultural development. These include but are not limited to over-emphasis on industrialization, low prices for agricultural goods in favour of the urban sector, the more favourable incentive structure for industrial sectors, tariffs, and quotas for industrial protection resulting in a price hike for seeds, fertilizers, and machinery.

In addition to these impediments, restricted access to financial resources can be regarded as one of the key reasons for the underdevelopment of the agriculture sector. According to World Bank Report on Agriculture in 2007, even though agriculture accounts for about 19% of all production and 50% of all jobs, it gets less than 10% of all investment resources. Private funding has been challenging because of the risks, low returns, and reliance on conventional farming. Also, there has not been much investment from institutions. From 1947 to 1959, when the World Bank was started, only \$ 124 million of the \$4 billion loans went to agriculture. In the 1970s, multilateral and bilateral sources of official development aid (ODA) to agriculture grew significantly. However, since 1979, the amount of ODA in agriculture has decreased from 18% to 3.5%. In absolute terms, it was worth the most in 1984, when it was worth \$ 8 billion (in US<sup>1</sup> dollars in 2004), and the least in 2004, when it was worth £ 3.4 billion (The World Bank, 2007). Agriculture is the primary economic activity in many developing countries.

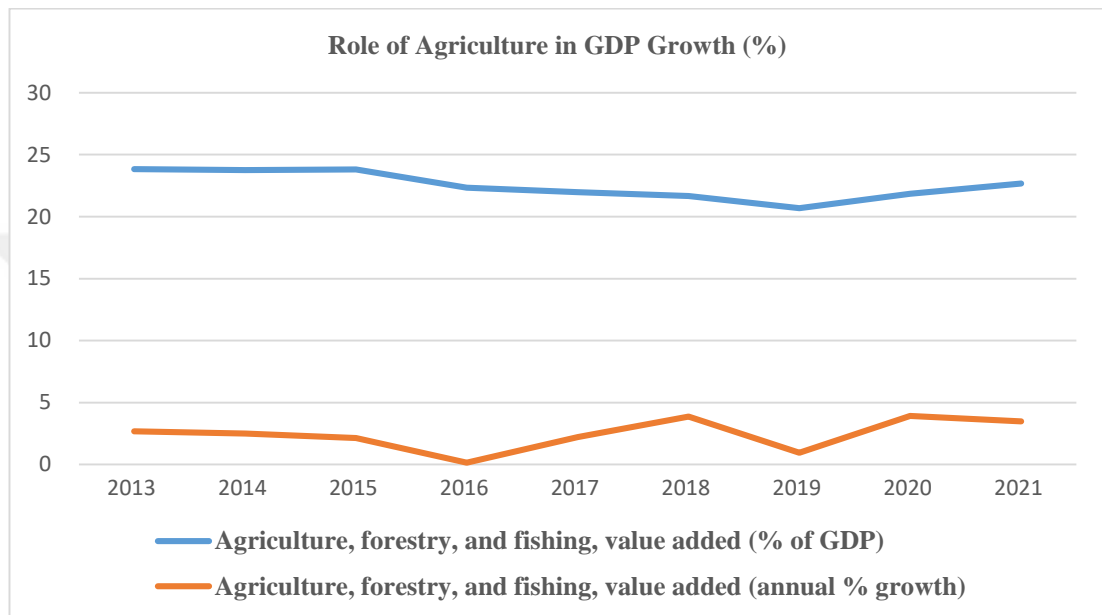
However, the non-agricultural sector grew with time, and its reliance on agriculture decreased. Despite its diminishing share of the national GDP<sup>2</sup>, agriculture remains Pakistan's most important industry. Agriculture now accounts for 19% of 2020-2021 gross domestic products, down from 24.5 percent in the 1990s, 32% in 1977-1978, 53% in 1959-1960, and 64% in 1947-1948. It employs 51 percent of the labour force.

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<sup>1</sup> United States

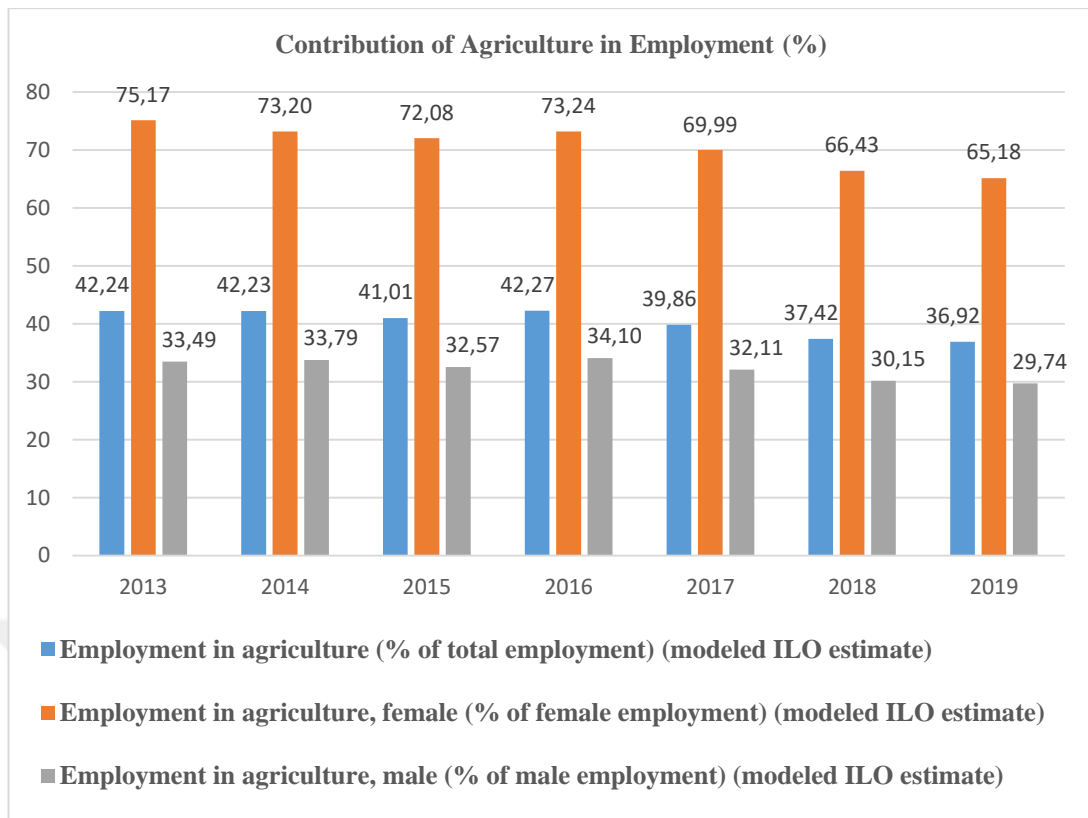
<sup>2</sup> Abbreviation for Gross Domestic Product

Agriculture and agro-based items account for three-quarters of our country's overall export income, and this industry supplies raw materials to several major corporations. The Agriculture sector consumes 33 percent of all industrial commodities, and rural areas are home to over 63% of the population. The following graph shows the data from 2013 and 2021, highlighting the role that agriculture plays in the growth of GDP. The source of this data is World Bank (World Development Indicators).



**Figure 1.1. Role of Agriculture in GDP Growth (Percentage)**

The following graph shows the Data from 2013 and 2019 highlighting the contribution of agriculture to employment. The source of this data is World Bank (World Development Indicators).



**Figure 1.2. Contribution of Agriculture in Employment (Percentage)**

As one of the main developing countries in South Asia, Pakistan’s economic growth and development are also highly dependent upon agriculture. Agriculture utilizes half of the population and provides necessary raw materials for the industrial sector. Pakistan's economy and agriculture have paved significant development in the last ten years, especially in the previous few years. However, the agricultural sector faces remarkable challenges such as waterlogging and saltiness of the soil, inadequate financial resources, an unstable marketing system, and a non-properly functioning cooperative structure. Fawad et al. (2013).

Among those challenges, limited access to finance is one of the key reasons for the problems in Pakistan’s agricultural sector. To enhance the agriculture sector, secure infrastructure, water for irrigation, reclamation of land, land drainage, and mechanical power are necessary, along with other essential inputs such as seeds, pesticides, and fertilizers. Funding for those essential ingredients is crucial for realizing the necessary agricultural production to feed the population of Pakistan, amounting to 230 million and growing at a pace of around 2%.

In the case of Pakistan, small farms of 12.5 acres (50,000 m<sup>2</sup>) or less are the norm in agriculture, making up about 75% of all farms. Small farmers cannot use the latest farming technologies because they have limited access to finance, cannot save much, and cannot accumulate much capital. Small farms may be unable to keep up even a typical production cycle for years after a severe drought or flood. As a result, they cannot use their land to its fullest potential and cannot get a higher yield per acre.

There are two alternative ways for farmers in Pakistan to access financing, namely informal and formal financing. While informal financing refers to the financial resources gathered from social networks such as relatives and friends, formal financing is provided mainly by financial institutions such as commercial banks, cooperative societies, and NGO<sup>3</sup>s. Iqbal et al. (2003).

Established in 1961, Zarai Taraqati Bank Limited (ZTBL), which is the Agricultural Development Bank of Pakistan (ADBP), is the country's principal and the most prominent lending institution, accounting for almost 40% of all agricultural loans in Pakistan as of June 2013. The ZTBL has 51 regional offices, 488 branches, and 1441 mobile credit officers all over the country. It serves 68% of the country's population that lives in rural regions with financial and non-financial services. The average loan amount was around Rs. 162,331 (Around 1500 USD as of 2013). The Bank was aiding 68 percent of farmers who produce food for their use, 29 percent of farmers who grow crops for profit, and 3 percent of big farmers. As of December 31<sup>st</sup>, 2011, the Bank had Rs 123 billion in assets, Rs 25 billion in the capital, and 5,789 employees in Pakistan. The market share of agricultural credits of ZTBL is 40% of all outstanding agricultural credits in Pakistan as of June 30<sup>th</sup>, 2013. Despite the efforts of the ZTBL, farmers still seem to be hesitant to apply for credit due to reasons such as high-interest rates imposed by the institutions, the distance of the Bank from their village/residence, unnecessary delays in the receiving of the loan payment, confusing and complicated procedures, illegal demands by bank officials, and the collateral demanded to obtain a loan from formal institutions. Iqbal et al. (2003).

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<sup>3</sup> Non-Governmental Organizations

The purpose of this study is to explore the effect of credits provided by the ZTBL on wheat productivity through the adoption of new technologies in the Bahawalpur district of the Punjab province of Pakistan. A survey is designed and applied to 300 clients of the ZTBL Bank. A dataset is compiled including the demographics of farmers such as age, education, farming experience, farm size, productivity per acre, land holding, the annual income generated by farming, credit taken from the ZTBL, usage of high-yielding varieties of seeds, fertilizers, pesticides, tractors, tube wells, levelling machines, harvesters, short-term loans, long-term loans, the form of credit, and technological knowledge. An OLS<sup>4</sup> regression analysis is conducted to measure the impact of credit usage and technology adoption on wheat productivity. The results indicated a positive impact of long-term loans and technology adoption on wheat productivity.

The major contribution of this study is two-fold. First and foremost, the study employs a new dataset for the Bahawalpur region in Pakistan, for which there has been little focus in academic literature. Secondly, the study provides additional evidence to support the hypothesis that agricultural microloans, whether they are short-term or long-term, contribute to productivity if they are used for the adoption of agricultural technologies.

The study comprises six chapters. In Chapter 1, we have briefly discussed the background of the research and the agricultural issues. In Chapter 2, we have described the literature review of microfinance and agricultural development. The brief history of Micro Loans in Pakistan and the case of ZTBL Banks has been given in Chapter 3. Chapter 4 consists of Data and methodological issues. The descriptive analysis of the study has been presented in Chapter 5. Chapter 6 contains an empirical analysis of the primary data using the OLS model, and in the last chapter, the conclusion and policy implications have been suggested.

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<sup>4</sup> Ordinary Least Square

## CHAPTER II

### LITERATURE REVIEW OF MICROLOANS AND AGRICULTURAL DEVELOPMENT

Reviewing previous studies on the subject matter is essential because it reveals background information about the issue to be addressed. It adds to the problem's direction and avoids the likelihood of unnecessary duplication of efforts. Previous studies may have yielded useful knowledge or research approaches. Some significant research was undertaken in Pakistan and elsewhere is examined here in context.

Rukhsana et al. (2017) investigated four Pakistani Punjab locations. The study aimed to examine how microcredit influences agricultural productivity, wheat yield, and food security by collecting field data using a standardized questionnaire. Analysis of data using SFA<sup>5</sup>, PSM<sup>6</sup>, and the inefficiency effects model. A stochastic frontier study identified inefficiencies in agriculture. Labour and seed explain agricultural performance variances less than fertilizer, irrigation, and machinery. Research indicated that microcredit, education, and agricultural experience help farmers use farm supplies effectively. The agricultural efficiency of microcredit borrowers was 1.56 percent larger than that of non-borrowers. According to propensity score matching, microcredit boosts agricultural income. 8.32 microcredit borrowers obtained a percent more income than non-borrowers. Microcredit enhanced agricultural productivity and efficiency, increasing farmers' income and purchasing power and bolstering food security by increasing wheat supply.

Girabi et al. (2013) investigate microfinance's impact on smallholder farmers' agricultural productivity in Tanzania's Iramba District. As answers, 98 credit and non-credit recipients were selected at random. In the analyses, descriptive statistics and

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<sup>5</sup> Stochastic Frontier Analysis

<sup>6</sup> Propensity Score Matching

multiple regression were used. Credit Beneficiaries (CB)<sup>7</sup> produced more agricultural goods than Non-Credit Beneficiaries (NCB)<sup>8</sup>, and the Credit Beneficiaries (CB) had more access to agricultural commodities markets, inputs, and improved agricultural practices. Credit access for smallholder farmers is hindered by a lack of understanding, limited loan availability, exorbitant interest rates, and default.

Sulemana and Adjei (2015) studied how microfinancing affected the agricultural output in the Pru District in Ghana as a case study to demonstrate their assertion. A multi-method approach combined case study and quasi-experimental (control group) approaches. A questionnaire, interview guide, and checklist were used for data collection. According to a survey, microfinance positively connects with agricultural production and substantially impacts output levels. Lack of collateral assets, moderate loan amounts, and a delay in the disbursement of agricultural loans, among other difficulties, impede credit availability.

Rasheed et al. (2016) studied socio-economic factors restricting the purchase of microfinance loans (MFIs). This study included both primary and secondary sources. After conducting a pre-test and engaging with the authorities of microfinance institutions, a multi-layered sampling strategy was employed to gather preliminary data from selected locations using standard questionnaires. The Tobit and various regression models were utilized to calculate the impact of socio-economic variables on access to microfinance opportunities and restriction levels. In addition, the frequency and percentages of responses were described. Demand for microfinance was affected by gender, age, education, farm size, and dependency ratio. Farmers' income was negatively related to microfinance demand. Distant MFIs<sup>9</sup>, challenging loan processes and high-interest rates topped the list of limits compiled by the survey. The results of multiple regression analyses indicate that education level, land ownership, and farmer preferences for informal funding reduce microfinance entry obstacles. For optimum resource allocation, MFIs favoured lending to educated and younger farmers, who were likelier to use the most advanced agricultural production techniques.

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<sup>7</sup> Credit Beneficiaries

<sup>8</sup> Non-Credit Beneficiaries

<sup>9</sup> Microfinance institutions

Khandker and Coolwal (2016) assessed the impact of growth in rural credit, including microcredit and banking institutions, on agricultural household yield in Bangladesh by analyzing household data for the last 20 years. Their research findings indicated the benefits of microcredit, particularly for households that owned/managed smaller lands by increasing agricultural revenue from activities that were less reliant on the ground, like livestock rearing and diversification of income not generated by farmland for all households, with the most significant impact on families with little to no land. Microcredit has little effect on agricultural revenue, while credit limits on the supply side significantly impact crop income. Males and women contributed to the growth in nonfarm income among marginal farmers, whereas only men contributed to the increase in nonfarm revenue among wealthier landowners.

Yaqub (1995) analyzes that we give the skills, social position, and resources instead of liquidity through micro-financing, which empowers the people and reduces repayment problems. He uses the data of the Bangladesh rural advancement committee in which there are many problems in repayment with repeat borrowing. The study suggested that micro-credit intervention based on incentives and self-enrichment reduces repayment problems and empowers the poor.

Khandker and Faruqee (1999) investigate that both institutional and non-institutional are essential in agriculture. The Institutional lender plays a more vital role in production than the informal lender and institutional lender bears more cost than they recover. For example, the ADBP and Government subsidize the formal finance scheme in Pakistan because agriculture has a higher lending risk.

According to Munir (2001), Pakistan's agriculture provides 25% of the country's GDP, although a lack of financing is a significant source of poor productivity. Capital drives the modern enterprise. Like farming, improving seeds, fertilizer, and equipment requires cash, as does harvesting. Non-institutional sources of credit comprise close relatives, neighbours, and small-scale financiers, whereas institutions include ZTBL. Pakistan survey reports, interviews, and questionnaires provide the data. Wasted land and labour are dependent variables, but institutional credit is independent. T-test demonstrates multicollinearity and variables. 1980-1990 was the weakest nominal credit growth. Credit comes from ZTBL and commercial banks. All parameter

estimations are significant at the significance level, except for the increases in the non-irrigated production and cropping system and technological efficiency. Loss of finance to farmers and low literacy rates are reducing technical efficiency.

Nakano and Magezi (2020) performed a randomized controlled experiment (RCT)<sup>10</sup> in Tanzania to analyze microcredit's impact on the adoption of technology and the Yield of rice farming. Randomly selected farmers were given agriculture-specific microcredit loans supported by BRAC, a renowned institution for microfinance worldwide. They utilize the treatment status as an instrumental variable for analyzing intention-to-treat impact and microcredit's local average treatment effect (LATE). They found no evidence that the BRAC program reduces chemical fertilizer usage. In addition, loan use does not impact paddy yield, rice farm profitability, or family income. According to the subsample research findings, credit does not increase fertilizer use among people with better access to irrigation water since they already use the required quantity of fertilizer. Most importantly, the increase in fertilizer use may not benefit productivity due to an unsatisfactory yield response to chemical fertilizer.

Ashaolu et al. (2011) explore the influence of loan availability on rural households' agricultural productivity in Ogun State, Nigeria. Using a questionnaire, information was acquired from 240 small-scale rural farmers, categorized as micro-credit users or non-users, based on their replies. According to the data, credit-using farmers had a higher total cost per hectare than non-credit-using farmers, implying that credit-using farmers misallocate their resources. Again, farmers who use credit had higher profits per hectare than those who do not, indicating that access to credit sources enhances farmers' productivity and income by generating more revenue and output. Only fertilizer and farm size have a favourable influence on credit users' production. However, planting material, agrochemicals, farm size, and fixed inputs harm non-credit users' output. According to the findings of this study, credit may boost agricultural productivity and profitability; as a consequence, existing banks should be encouraged to create new rural branches, and the Federal Government should make it easier for rural farmers to acquire more agricultural land.

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<sup>10</sup> Randomized Control Trial

Saqib et al. (2018) studied the key characteristics influencing access to agricultural financing in regions susceptible to floods in Pakistan using a standardized questionnaire. Most farmers' opportunities to obtain credit were seriously dictated by their education level, total freehold land, agricultural experience, income, and family size. Socio-economic factors significantly impact farmers' access to agricultural loans in flood-affected areas of Pakistan.

Shah et al. (2016) analyze how the credit provided by ZTBL impacts farm output in Peshawar (KPK)<sup>11</sup>. One hundred thirteen respondents were randomly chosen in Urmar Maina, Peshawar, and Pre-tested interview schedules gathered the data. The results suggest that 44% obtained seed loans, 22% got equipment loans, 20% got fertilizer loans, and 13% got farm yard waste loans (FYM)<sup>12</sup>. A comparison of agricultural input used before and after the credit shows a significant improvement. While all crops, except apricot, showed a considerable rise in Yield per acre before and after the credit. As a result, the input consumption has increased output significantly.

Chandio et al. (2018) examine the effects of long-term and short-term loans on wheat yield in the province of Sindh in Pakistan. The findings are derived from cross-sectional data from 18 villages in Sindh, Pakistan, including Shikarpur, Sukkur, and Shaheed Benazir Abad, collected in 2016. The sample had 180 wheat farmers. Data analysis was conducted using instrumental factors (i.e., 2-stage least squares) and the Cobb–Douglas production function. This study asserted that agricultural loans positively impacted wheat yield, with short-term financing having a more significant impact than long-term loans. The phenomena might be caused by enhancing other agricultural factors, such as higher quality seeds and fertilizers, which could boost wheat output the following year. Long-term loan holders spend more on land preparation, irrigation, and plant upkeep, potentially increasing future wheat yield.

Kumar et al. (2021) used the NSS<sup>13</sup> decennial assessment surveys conducted between 2003 and 2013 to analyze the access to banking/institutional credit in eastern India for farmers. The credit increases input utilization and output. Eastern India's loan per acre was lower than the average for the whole country. This region's institutional credit

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<sup>11</sup> Khyber Pakhtunkhwa

<sup>12</sup> Farm Yard Manure

<sup>13</sup> National Sample Survey

deteriorated between 2003 and 2013. According to Cragg's twofold hurdle and Heckman selection models, the position of assets and size of holdings for a household positively impact access to institutional loans. Formal credit availability might be influenced by education and family size. Socially disadvantaged families have a lower level of formal credit. Increased household credit is connected to assets, holding size, and education. Agriculture-based families received less institutional credit. Farmers with small holdings, uneducated, and from lower classes encounter more difficulties getting institutional loans despite government attempts to promote financial inclusion. Small and marginal farmers need more finance but have a low collateral foundation.

In light of Pakistan's agricultural credit policy, Saqib et al. (2018) assess farmers' loanaccess. The study examined secondary and primary data, and the State Bank of Pakistan and Pakistan Economic Survey supplied secondary data. A house survey of 168 subsistence farmers was undertaken by analyzing access to credit and adequacy ratios. Significant loan availability and adequacy variations were identified across the three farmer groups (higher, medium, and lower subsistence levels). The adequacy of farmer credit was estimated using the Tobit regression model. The empirical results revealed that subsistence farmers had less finance available than the recommended national strategy for agricultural credit. Farmers with higher subsistence have better access to capital than middle and lower-level farmers. The informal credit of subsistence farmers was above average, whereas formal credit was below average. The lowest and medium subsistence farmers have the least capital for agricultural investment. According to a study, agricultural credit adequacy was influenced by age, level of education, farming experience, family size, and proportion of own land.

Bashir et al. (2010) investigated the impact of loans on wheat yield in Pakistan's Lahore region of Punjab province. The institutional loan source used in the study was United Bank Limited (UBL)<sup>14</sup>. A well-structured questionnaire was employed to divide the district into three strata to collect primary data. Two villages were picked randomly from each stratum, and ten loanees were interviewed randomly from the UBL's list. For comparison, a similar number of non-borrowers were also selected. For analysis, a multiple regression model was applied. According to the findings,

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<sup>14</sup> United Bank Limited

agricultural finance is critical in encouraging agricultural transformation and enhancing farmer participation in production.

Saleem and Jan (2011) contend that credit impacts agricultural GDP. From 1990 to 2008, the statistics agency for crop reporting services, Dera Ismail Khan, collected data on loan disbursements from formal sources and agricultural GDP of essential crops in the study area. Using linear regression with Cobb-Douglass, the data were evaluated. Significantly correlated to agricultural GDP were seeds, fertilizers, pesticides, irrigation, and tractors (0.87, 0.58, and 0.42). Credit had an almost 80% effect on agricultural GDP, and credits for seeds, fertilizers, etc., had a more significant impact. Researchers discovered that credit availability increased agricultural output.

Kofarmata (2016) analyzed numerous field studies on the elements that impact farmers' loan demand. Most of the results were inconclusive, considering the research regions' geographical, socio-economic, environmental, and contextual differences. Based on this, the study calls for more empirical research on the factors of loan demand in a particular location to develop policies that are supposedly a better fit for a particular region. This, has enormous significance in agricultural productivity and loans for farmers, particularly in emerging nations.

Credit's influence on agricultural output was investigated by Noonari et al. (2016). Most respondents (95%) knew the ZTBL's agricultural lending plan. The results indicate that the average farm area used for cultivation by farmers who applied for loans is greater than that of farmers who did not benefit from the loan scheme. It was also concluded that loanee farmers had higher production costs than non-loanee farmers. Credit significantly impacts the productivity and output of major crops such as wheat and sugarcane, but the crucial element is efficient credit usage. All of these facts lead to the conclusion that ZTBL bank is efficiently supporting Pakistan's agricultural sector via its loan distribution program, thereby enhancing the living standards of rural regions, decreasing poverty, and eventually boosting the country's economy.

Ahmad et al. (2015) examined the impact of financing on wheat output in the Jhang region of Pakistan. The study also investigates farmers' loan reasons and credit sources

in Jhang. This study utilized the primary data gathered from 8 villages in the region. Each zone selected two villages; each community had ten recipients and ten non-recipients. There were 160 farmers sampled. CDPF was used to examine data. According to the study, credit increases wheat productivity. However, 30% of creditors use loans to purchase seed and fertilizer, whereas about 70% use loans for other expenses such as weddings, rituals, and land/tractor acquisitions. Eighty percent of ZaraiTarqati Bank Limited's customers utilize credit (ZTBL).

Ayeomoni and Aladejana (2016) used the ARDL approach to explore how agricultural funding for farmers impacted Nigeria's economic development from 1986 to 2014. The study used data from Nigeria's Central Bank and the Bureau of Statistics reports (over the years). The findings demonstrated a short-term association between agricultural credit, private domestic investment, the inflation rate, and economic growth and a long-term relationship between economic growth, agricultural credit, and the real exchange rate. Furthermore, considering that the agricultural sector is regarded as a development engine for other real economic sectors, the study revealed that agricultural credit is a critical driver of economic growth.

Hanau et al. (2015) used the logistic regression model to analyze the critical factors impacting families' aspirations for securing agricultural funding, emphasizing participation in an organization, using survey data from USAID's<sup>15</sup> initiative of Feeding the Future. 2,330 agricultural families from Northern Ghana were employed in the study. The analysis model identified farmers' age, education level, and credit source as critical positive factors.

Using BorgaChashiUnnayan Prakalpa (BCUP) survey data from Bangladesh, Jimi et al. (2016) examine the impact of subsidized loans on small and marginal rice farmers' productivity and efficiency. They show that removing financial constraints boosts agricultural output and efficiency. Small-scale rice farmers that get subsidized finance are more productive than those who do not. Removing financial constraints allows small and marginal farmers to reinvest in modern rice varieties. Treatment farm families cultivate more modern hybrid rice than control households. They believe that

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<sup>15</sup> United States Agency for International Development

loan benefits marginal and small-scale rice farm households' overall production and efficiency. Increasing small farm funding availability is critical for long-term agricultural growth and rural agrarian efficiency.

Nagahage and Dilrukshi (2012) studied the profiles and reimbursement behaviour of 60 randomly chosen farming families in Dambulla's 5 Garama Niladhari divisions. It found four primary factors: microfinance-linked behavioural components, bank rules, and uncontrolled repercussions, credit abuse factors, and income-related factors. There was a strong association between loan repayments and age, limited land cultivation, life insurance premiums, microfinance-related characteristics, and abuse of credit. The research argued that farmers must be trained to manage the credit and the relevance of cash flow to improve loan repayment capabilities.

Chandio et al. (2020) examined the impacts of climate change and institutional on agricultural Yield in Pakistan. This study also considers the technical aspects and variables, i.e., quality of tractors, energy usage, tube wells or other irrigation systems, and labour force). The study spanned the years 1983 to 2016. Autoregressive distributed lag (ARDL) examines the cointegration between underlying variables. At the same time, they used the Granger causality test concerning the vector error correction model (VECM), which establishes the direction of causation. ARDL bounds testing set a long-term association between credit received from formal sources, climate change (mainly CO<sub>2</sub> emissions), use of technology (tube wells and tractors), consumption of energy, labour force, and agricultural production. Agriculture's short- and long-term production is enhanced by formal funding, technical use (tractors), and the labour force. CO<sub>2</sub> emissions marginally increase agricultural production. Formal credit, labour force, energy consumption, and technological factors (tractors, tube wells) all have a unidirectional effect on CO<sub>2</sub> emissions.

Nayava et al. (2009) studied wheat output in Nepal from 1970/71 to 2007/08. 70% to 90% of Nepal's annual rainfall occurs during the monsoon (from June to early September). Wheat is cultivated throughout the dry winter months; thus, supplementary irrigation is required. There are wheat types tailored to the local climate. Improved seeds, advanced farming techniques, and supplementary irrigation have bolstered Nepal's wheat cultivation. Future wheat production plans in Nepal

should account for global warming. Even though the farmers have modern tools, i.e., advanced irrigation systems, quality seeds, and fertilizers, weather, and environment significantly influence Nepal's wheat production.

Ahmad et al. (2022) examined the potential association between coordinated agricultural financing and diversification adoption in Punjab, Pakistan, to reduce catastrophic wheat risk. The study used random sampling to collect data from 480 wheat farmers in 6 regions of Punjab. Employing multinomial and bivariate probit regression models, they examined farm and societal characteristics, catastrophic risks perceived by the farmers and their disposition toward the sources of risk, and the relationship between agricultural financing and risk management strategy (mainly diversification). According to the study, adopting one risk management strategy usually leads to the adoption of other strategies by the farmers. It was also indicated that the farmer's level of education, age, income, total land owned, size of farming land, and risk aversion influence risk management methods.

Atinafu et al. (2022) attempt to point out the key factors that influence the farmers to adopt advanced wheat production technologies in the Gorge district of Ethiopia. The research results are from primary and secondary data from 150 randomly selected families. Respondents were interviewed using various structured and non-structured techniques. The Tobit model was used to analyze the significant factors that impact the use of technology, leading to increased wheat output. Land ownership, income, education, social group participation, access to funding, and a favourable mindset towards new wheat production technologies all have a decisive and substantial influence on acceptance and adoption. The age of farmers and market access considerably impact the adoption of advanced wheat production technologies.

Williams (2014) examines the strong relationship between access to financial sources, food, and agriculture via commodity index funds, farmland investment opportunities, or trading of commodities by agricultural firms. While these concepts have attracted the attention of industry and academia in recent times, most of the current work on the "financialization of food" focuses mainly on viewing finance as an external force, highlighting the inorganic and imbalanced nature of its association with agriculture and its negative impact on global agricultural markets. Recognizing the importance of

finance for agriculture, this research puts forward an extensive and delicate examination of the effect of financialization on agriculture. This dynamic is examined with a case study of financialization processes in the demise of the Canadian Wheat Board as a state marketing agency. The study offers an in-depth analysis of understanding agriculture in a specific financial sector framework and financialization's role and limitations in communicating with the world outside of large-scale financial centres.

Asim et al. (2015) assess the impact of agricultural finance on cotton and wheat production in the Sahiwal district of Pakistan. Fifty percent of the farmers received a loan, while the other half did not. The Cobb-Douglas production model was used to assess the agricultural productivity of wheat and cotton. Wheat seed price, cost of irrigation (tube wells or other sources), and agricultural credit were determined to be 0.37, 0.98, and 0.026, respectively. For cotton, except for the cost of irrigation and seedbed preparation (1 percent and 7 percent, respectively), all variables were quite considerable. Since agricultural credit boosts crop yield, the study suggests adopting a straightforward lending procedure, subsidizing agricultural equipment, and increasing information about agricultural loans. These measures will boost wheat and cotton farmers' access to loans.

## **CHAPTER III**

### **A BRIEF HISTORY OF MICROFINANCE IN PAKISTAN: THE CASE OF ZTBL**

#### **3.1. A Brief Overview of Microfinance in Pakistan**

The idea of microfinance in Pakistan is not a new concept in Pakistan, as it is in many underdeveloped countries. The initial efforts in microfinance in Pakistan were taken in the mid-1980s when some NGOs and other institutions started to finance microloans to low-income individuals and small businesses. Though these initial programs were mainly informal and operated on a small scale, they played a vital role in building the foundation for the growth of the microfinance industry in Pakistan.

Later in the 1990s, the Government of Pakistan also started taking interest and began to take a more active role in promoting microfinance, recognizing its potential to support economic development and poverty reduction. Gradually, new organizations and institutions also started to enter the microfinance market, resulting in growth in the overall market. The reason behind this growth was the friendly policies of the regulatory bodies, attractive donor programs, and increasing demand for financial services among low-income individuals and small businesses (Shahnaz et al. 2009).

However, despite its initial success, the microfinance industry in Pakistan faced many challenges in the 2000s. The main reasons behind these challenges might be linked to the global financial crisis of 2008, as many microfinance institutions struggled to get funds and support from donors due to the ongoing economic crisis. Moreover, the microfinance industry was criticized for its high-interest rates, making these services less attractive to the customers as they were supposed to be economical for its customers, mainly low-income individuals and small businesses (Sulaiman, 2010).

However, the microfinance industry in Pakistan has shown positive growth, all thanks to new technological advancements and digital banking services. This has played a

significant role in expanding access to financial services in remote and rural areas and also has enabled microfinance institutions to acquire that segment of potential customers who were out of reach for traditional banking services.

Overall, if we try to summarize the history of the microfinance industry in Pakistan, we can witness the typical challenges and opportunities faced by microloan institutions in many developing countries. Despite the challenges, the microfinance industry and the NGOs providing similar services have played a positive critical role in boosting the country's socio-economic development and poverty alleviation. The sector has a remarkable potential to continue to make a significant contribution in the future.

### **3.2. Major Micro-Financing Institutions in Pakistan**

There are approximately 36 institutions in Pakistan that provide microfinance services across the country. Some of the prominent microfinancing institutions are as under:

**Akhuwat:** Akhuwat is one of the most popular non-profit organizations in Pakistan that provides interest-free microfinance loans to marginalized community members. It was founded in 2001 by Dr Amjad Saqib, a former civil servant, and banker. Akhuwat has a vast network of over 800 branches across Pakistan. It provides microfinance loans to over 5.4 million people and has disbursed over Rs. 180 billion in loans. Besides giving micro-loans, Akhuwat offers other services such as financial literacy and training, health services, and education.

**Kashf Foundation:** Kashf Foundation is another well-known non-profit organization based in Pakistan that provides microfinance services to the poor and needy. It was founded in 1996, and since then, it has been doing great work in microfinancing and helping those in need. Kashf's primary services are financial services, insurance, capacity-building training, and social advocacy interventions.

**Khushhali Bank:** Khushhali Bank is a microfinance bank based in Pakistan. It was founded in 2000 by the Government of Pakistan and now operates under the guidance of the State Bank. It was established as a sustainable platform for the underserved public. Its main objective is to reach the country's neediest sector, mainly working for women's empowerment and poverty reduction.

**Tameer Microfinance Bank:** Tameer Microfinance Bank is a microfinance bank based in Pakistan. It was founded in 2006 by a group of investors and is now owned by Telenor Pakistan, one of the country's largest telecommunication companies.

**First Microfinance Bank:** First Microfinance Bank is a microfinance bank based in Pakistan. It was founded in 2002 by the Agha Khan Rural Support Programme (AKRSP). These are the pioneer institution that operates in one of the most neglected regions of Pakistan, Gilgit-Baltistan (Sulaiman, 2010).

**NRSP Microfinance Bank:** NRSP Microfinance Bank is a microfinance bank based in Pakistan. It started working in 2011 with the vision of providing financial services to marginalized clients nationwide.

Many more notable institutions are doing outstanding work in the field of microfinancing in Pakistan. Still, we will focus on the most critical institution directly relevant to our thesis topic, i.e., ZTBL. So, we will explore the ZTBL as a case study in detail.

### **3.3. Zarai Taraqati Bank Limited (ZTBL)**

The Zarai Taraqati Bank Limited (ZTBL), or Agricultural Development Bank of Pakistan (ADBP), is Pakistan's leading source of financial and technical assistance for agricultural development. The former ADBP is being reorganized to achieve the following objectives:

- I. Increasing agricultural production to enhance agriculture and the rural sector.
- II. Making the formal credit process more efficient.
- III. Improving the agricultural community's ability to generate money

After the abolition of the ADB<sup>16</sup> Ordinance of 1961, ZTBL was established as a public limited corporation on December 14<sup>th</sup>, 2002. The firm was established in 1984 under

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<sup>16</sup> Agricultural Development Bank

the Companies Ordinance, under the supervision of an independent Board of Directors, to ensure autonomy, domination, and the delivery of high-quality agricultural equipment.

### **3.3.1. History of the ZTBL**

Pakistan, mainly an agricultural country, needs finance to expand rapidly. The Agricultural Development Finance Corporation (ADFC) was founded in 1951 to offer financial services for the enhancement and modernization of the agricultural sector and other related industries such as forestry, fisheries, animal husbandry (which includes poultry farming and dairy farming), and horticulture (including greenhouse gardening).

Under the Agricultural Development Bank Act, the Agricultural Development Bank of Pakistan was created in September 1957. ADBP is responsible for giving cash or in-kind financings, such as a warehouse or storage facility, to assist farmers and cooperatives. Due to their similar aims and usage of government funds, the Agricultural Development Bank and the Agricultural Development Finance Corporation amalgamated in February 1961. As a result, the Pakistan Zarai Taraqati Bank Limited was formed. The governance of such agricultural development banks as banking corporations is controlled under the State Bank of Pakistan Act and the Banking Companies Ordinance.

### **3.3.2. Management Structure of the ZTBL**

The Bank's board of directors comprises 12 federal government and Ministry of Food and Agriculture officials, along with a federally chosen chairman. This board has one delegate from the State Bank of Pakistan, four provincial government officials, and one non-official representative from each province. Finally, the president guides the senior executive, who then leads the senior vice president, the vice president, the assistant vice president, and the assistant vice president of ZTBL.

Previously, the Bank exclusively served as a government entity, and every action required permission. The bank administration board will now have complete control

over the ZTBL. Over 2,000 bank employees have participated in the Voluntary Golden Hand Shake Scheme.

The bank organized a task group to enhance staff performance and reviewed disbursement, recovery, and field officer performance. The task force will comprise 10 to 15 officers, each of whom will be in charge of a desk that will monitor three to four sectors. The task force is responsible for frequently assessing the performance of Managers, MCOs, and Regional Managers concerning the credit and recovery policies of the Bank.

### **3.3.3. Mission of the ZTBL**

ZTBL's mission is to offer cost-effective, long-term, and sustainable financial and technical services to farmers and the agribusiness sector, benefiting the Bank and lending farmers.

The corporation's objectives include:

- To serve as the country's economically and operationally sustainable RFI<sup>17</sup> and assist rural people in enhancing agricultural productivity and income via timely loans, consultation, and auxiliary services.
- Portray ZTBL as a customer-friendly, administratively successful, financially sound, and domestic product-deploying business.
- Creation and delivery of 2-way linkages to enhance agricultural commodity chains with added value.
- Participation in private-public and retail-wholesale collaborations to expand the network and cut operational costs.
- To serve as a commercial bank at the rural level for enhancing agricultural capital formation by providing the actual value of borrowed credit to its clients and to offer a diverse set of risk assurance/reduction solutions to the clients, as well as to provide operational facilities to the domestic and international banking industries to gain a competitive advantage.

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<sup>17</sup> Rural Financial Institution

### 3.3.4. General Credit Disbursement Policy of the ZTBL

The Bank disbursed an aggregate sum of Rs. 95,420 million in 2015 compared to Rs. 81,934 million in 2006, reflecting a 16.5 percent increase. In 2015, the Bank served 408,456 clients, a slide decrease from 414,358 borrowers from the previous year. Wheat and sugarcane yields have improved due to increased ZTBL credit throughout the evaluation. To improve cash flow, the bank increased the amount of money it recovered and recycled it to raise distribution.

The general credit program supports several agricultural activities. Items that may be eligible for providing loans include:

**Production/Seasonal loans:** These are the loans provided for seeds, fertilizers, pesticides, medications, chicks, poultry feed, artificial Insemination services, effective microbes technology (EMT)<sup>18</sup>, hire charges of agricultural power, water charges/electrical charges, fuel wood for tobacco curing, ration, Ice for marine fisheries, funding for sulphuric acid, and the generator used to purify the salt water. Usually, major sections (Almost 75%) of loans are disbursed as production loans.

**Development loans:** These are the loans provided for the installation cost of a tube well, a transformer and auxiliary structure, tube wells, irrigation pumps, i.e., Peter engine, open wells, procurement of latest technology, Sprinkler irrigation, drip irrigation, orchards, minor crops, fattening of livestock, trucks, windmills, and fruit vegetable dryers. About 25% of overall disbursed loans fall into development loans.

### 3.3.5. Loan Limits Under General Credit Scheme

Loans for agricultural production and development have a maximum credit limit of Rs. 1.00 million rupees under the general credit regime. Short-term, medium-term, and long-term loans have maturities of a maximum of 18 months, maximum of 5 years, and more than 5 years, respectively.

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<sup>18</sup> Effective microbes technology

Individuals, private and public limited companies, and cooperative societies can obtain agricultural loans from the Bank, provided they can demonstrate that the funds will be used for agricultural purposes or product development, as well as they have the capacity for storage, warehousing, marketing, or processing of farm products. This includes the rural cotton sector, as well.

The board of Directors fixes the rate of return that the bank charges on credits periodically, following the guidance provided by the State Bank of Pakistan (SBP)<sup>19</sup>. Currently, the rates of return ZTBL is charging are as the following:

As discussed above, the disbursed loans can be divided into two categories, i.e., production loans and development loans. So, according to the 2017 ZTBL's markup rate on production loans is 15% and 15.8 % markup rate per annum on development loans (Profit, 2017). Though these are the general markup rates but the bank applies different markup rates for different schemes, and the region where the loan is to be disbursed also matters while considering the markup rates. In short, the actual markup rate varies based on schemes and the underlying condition. For Example, if we take the example of the most popular loan scheme of ZTBL for 2023, which is the Tractor Loan Scheme, the markup rate is 19.50 % (Tractors, 2023). The maximum loan amount is limited to Rs. 1 million, and the leasing maturity is 5 to 7 years. Likewise, the ZTBL may also offer subsidies in the markup rate in special cases like during the recent flood crisis in Pakistan, ZTBL decided to give a subsidy of Rs. 20 billion to more than 57,000 farmers affected by the flood (DAWN, 2023). So we can conclude that the markup rates of ZTBL are mostly designed by the guidance of the SBP, and more importantly, the purpose nature of the loan scheme is the key factor.

### **3.3.6. Thematic Loan Schemes**

Besides the general credit scheme, there are some thematic schemes through which the ZTBL provides credit to the agriculture sector. For instance, under the supervised agriculture credit scheme, short-medium-and long-term loans of up to 1,000,000 PKR are offered per borrower. Tractors, agricultural equipment, tube wells, livestock,

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<sup>19</sup> State Bank of Pakistan

orchards, and irrigation systems are among the items financed. In addition to funding and technical aid for farm planning and production, the program provides farmers with counselling on scheme implementation, marketing, and loan repayment. There is a scheme called Zarkhaiz (one-window-operation) scheme that provides the farmers with financing for immediate input needs. Under the white revolution scheme, financing for the equipment at dairy farms, such as milk cooling tanks, cooling pads, generators, voltage regulators, hot water geysers, and water pumps. Sairab Pakistan Schemestands for the support of tube wells. The ZTBL also has a scheme for women's empowerment called Khawateen Rozgar Scheme. This loan is available in all branches of ZTBL and provides services to rural women with the capacity and knowledge to use agricultural loans. The maximum amount is Rs. 0.5 million, and there is a condition of a 10 % contribution from the beneficiary.

To sum up, the ZTBL is the main financier of the agricultural sector in Pakistan. This is one of the main reasons we selected ZTBL as a case to analyze the impact of credits and technology adoption on wheat productivity. The next section summarizes the data and the methodology used in the study.

## CHAPTER IV

### DATA AND METHODOLOGY

This study investigates the effect of financing and the technical adaptation by farmers on wheat production using the ordinary least square approach on primary data sets from the district of Bahawalpur in Punjab, Pakistan. Nawab Bahawal Khan Abbasi I established the state of Bahawalpur. For more than 200 years, the Abbasi dynasty dominated the country (1748 to 1954). Bahawalpur State became a part of Pakistan under the reign of the last Nawab, Sir Sadiq Muhammad Khan Abbasi V. Previously the state capital, Bahawalpur is currently the District and Divisional Headquarters of the Bahawalpur Division. The district of Bahawalpur comprises five tehsils: Bahawalpur, Khairpur, Yazman, Ahmedpur East, and Hasilpur.

According to Pakistan's 2017 Census, the Bahawalpur district has a population of 3,669,176 people. Bahawalpur district has a total size of 24,830 square kilometres. Bahawalpur residents speak 25.1 percent Punjabi, 67.1 percent Saraiki, and 5.7 percent Urdu. The majority of Bahawalpur consists of rural which is about 2,497,014 people, and the urban portion is 1,172,162 people. The literacy rate of the district is very low at 50.27 percent.

#### **4.1. Agriculture in Bahawalpur District**

The Bahawalpur district is one of the most fertile districts in Pakistan and has a diverse range of agricultural products, including wheat, rice, sugarcane, cotton, fruits and vegetables, and livestock. Fruits exported from Bahawalpur include mangoes, citrus, dates, and guavas. Cotton and wheat are among the most important crops grown in the district, and they are widely used as raw materials for the country's textiles and food processing industries. As a growing industrial city, Bahawalpur has benefited from various government initiatives to promote the sector's growth and competitiveness. Some significant initiatives include investments in irrigation infrastructure, providing credit and other support services to farmers, and implementing innovative farming

techniques and technologies. In recent years, there has also been a growing focus on agribusiness and value-added activities in the district. This includes the development of food processing industries, the promotion of organic farming, and the establishment of farmers' markets and cooperatives.

#### 4.2. Data Collection Process

Data gathering, processing, and result interpretation are the heart of every research. There are three types of data: primary, secondary, and tertiary. The information for this study was gathered from the population of District Bahawalpur, situated in Punjab, Pakistan. The survey uses a primary random sampling method as well as a stratified random sampling method. We selected 300 farmers randomly from ten villages in Tehsil Hasilpur. We chose 30 farmers at random from each community. The survey questionnaire style covers a variety of socio-economic aspects of the farmers. The data was gathered through interviews with selected farmers by directly questioning the target group. The survey was placed in April and May 2022.

#### 4.3. Selection of Variables

Some essential quantitative and qualitative explanatory variables have been considered in this study based on theory and literature. The description list of the selected variables for ordinary least square analysis is given below:

**Table 4.1. Description of the Variables**

<b>Variable</b>	<b>Description of Variables</b>	<b>Hypothesized Relationship</b>
<b>Dependent Variable</b>		
	Wheat Productivity	
<b>Explanatory Variables</b>		

**Table 4.1. (cont.)**

LHOLD <sup>20</sup>	Land Holding (in Acres)	Positive
EDU <sup>21</sup>	Farmer Education	Negative
FERTI	Fertilizer = 1 If the farmer has used the fertilizer = 0 If the farmer has not used the fertilizer	positive
HYV <sup>22</sup>	High-yielding varieties of seed = 1 If the Farmer has used the high-yielding varieties = 0 If the Farmer has not used the high-yielding varieties	positive
LOTL <sup>23</sup>	Long term loan = 1 If the Farmer has received along-term loan = 0 If the Farmer has not received a long-term loan	positive
TRACT	Tractor = 1 If the Farmer owns a Tractor = 0 If the Farmer does not own a Tractor	positive
LEVEL	Leveller = 1 If the Farmer owns a Leveller = 0 If the Farmer does not own a Leveller	positive

<sup>20</sup> Land Holding

<sup>21</sup> Farmer education

<sup>22</sup> High-yielding varieties

#### 4.4. Methodology

The multiple linear regression model investigates the relationship between one or more independent variables and a dependent variable. The linear regression model's generic version is

$$Y = f(X_1, X_2, X_3 \dots) + \varepsilon_i \\ = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_K X_K + \varepsilon_i$$

In this model,  $Y$  is the dependent variable, while  $X_1, X_2, X_3, \dots$ , and  $X_k$  are the independent variables. One's hypothesis will state,  $f(X_1, X_2, X_3 \dots X_k^{24})$ . This is known as the population regression equation of  $Y$  on  $X_1, X_2, X_3, \dots, X_k$ .  $Y$  is the regressed in this case, and  $X_k, k=1,2, \dots, K$ , are the regressors or variables. The baseline theory will determine the explained and explanatory variables in the model.

Thinking in terms of autonomous variation is frequently beneficial for modeling reasons. The movement of independent variables can be imagined outside the model's relationships. However, the behaviour of the explained variable is considered a response to explanatory or external stimuli. A *random disturbance* is a phrase because it "disturbs" an otherwise steady connection. The disruption occurs for several reasons, the most important of which is that no model can cover all effects on an economic variable, no matter how detailed. The disturbance captures the net influence of these neglected components, which might be positive or negative. In an empirical model, there are several more sources of disruption. The most important is most likely measurement mistakes. It is one thing to postulate about the connections between precisely specified variables; quite another to collect exact measurements of these variables. For example, the difficulty of making adequate measurements of profits, interest rates, capital stocks, or, even worse, flows of services from capital stocks is a recurrent problem in the empirical literature. In the extreme, the theoretical variable may have no observable counterpart.

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<sup>23</sup> Long-term Loan

<sup>24</sup>  $K$ th independent variable

The observed value of AY (Average Yield) is the product of two elements: predictable and random. We aim to estimate the model's unknown parameters, and we will use the data to investigate the validity of the hypothetical assumptions and forecast the variable AY. How we proceed from here depends critically on our assumptions about the stochastic process that results in our observations of the data at hand.

Regarding methodological issues, wheat productivity (PROD) using technologies with ZTBL credit as the dependent variable. Agricultural productivity is estimated as the proportion of agricultural input to agricultural output. Wheat productivity is usually measured by weight (in Munds 40 Kilograms), or production is generally calculated as the market value of the resulting work. Regressions are commonly used in previous empirical analyses with an OLS, Probit, or Logit Model on this topic. Econometric theory informs us that OLS will offer us reasonable estimates of the parameters for estimating technological relationships, and OLS is a suitable estimation approach. (Hal R. Varian) Agricultural productivity is utilized as an explanatory variable in the OLS approach. This variable is regressed against various technical factors and other explanatory variables. The OLS method investigates the influence of numerous explanatory factors, including technical variables, on agricultural output.

#### **4.5. Ordinary Least Square Method**

The German mathematician Carl Friedrich Gauss is best known for developing the ordinary least squares method. Under specific conditions, the ordinary least squares approach has some immensely appealing statistical attributes that make it one of the most popular and influential regression analysis methods. "Using primary data sets, the influence of technology on wheat productivity may be empirically assessed using the Ordinary Least Squares (OLS) approach. OLS is still one of the econometric models' most often used methods for estimating variable dependency. The quality of fit of the model is quantified by the R-squared value, which ranges between 0 and 1. The closer the R-square value was to one, the greater the model's fitness. R-squared is the ratio of the total variation in the dependent variable predicted by the independent variables. (Chaudhry & Nosheen, 2009). The OLS estimate takes the following general form.

$$y = \alpha + \sum_{i=1}^n \beta_i * X_i + \varepsilon_i$$

Where  $n$  is the number of independent variables from 1 to  $n$ .

$\alpha$  is the intercept,

$\beta_i$  is the vector of coefficients of the independent variables

$X_i$  is the matrix of independent variables

$y$  is the vector of the dependent variable

$\mu_i$  is the vector of error terms

Following is the regression analysis of the data collected via the survey conducted among 300 farmers.



## CHAPTER V

### ANALYSIS OF THE RESULTS

#### 5.1. Descriptive Analysis of the Sample Data

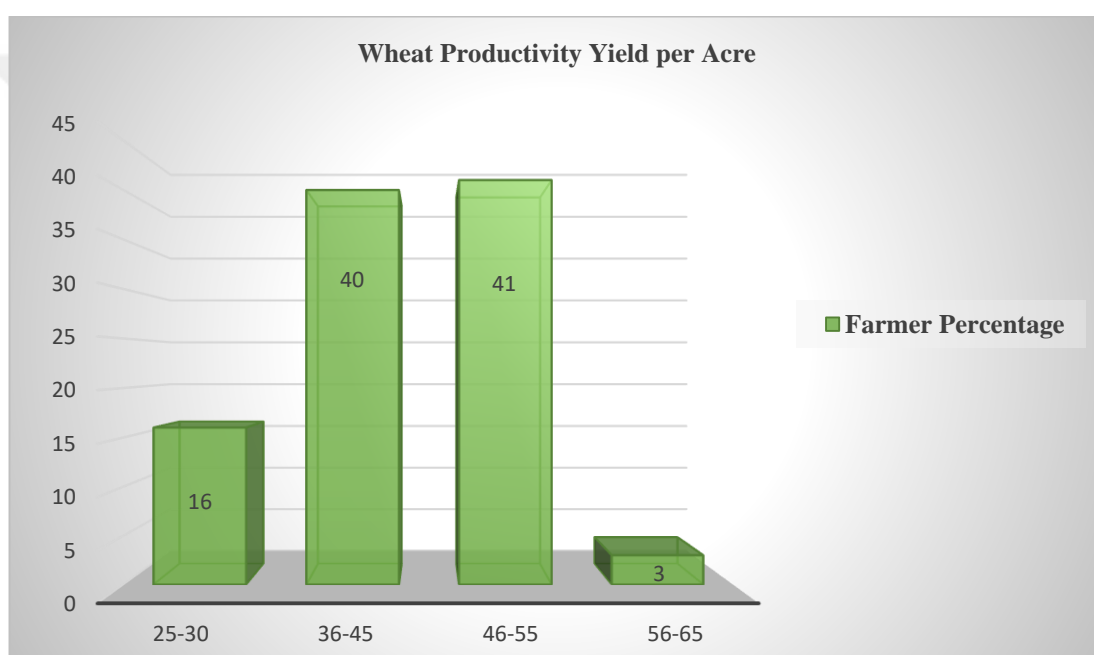
The study is based on primary data sources. We conducted an empirical analysis of the data and tried to determine the impact of technologies developed by ZTBL on wheat productivity. We also conducted a descriptive study of farmers' socio-economic characteristics related to agriculture. The descriptive statistics of the variables are given in Table 5.1 below: The first column shows the list of variables. Mean and standard deviation values are in the second and third columns, and minimum and maximum values are given in the fourth and fifth columns correspondingly.

**Table 5.1. Descriptive Statistics of Selected Variables**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>PROD</b>	45.02	7.2236	25	64
<b>EDU</b>	6.34	4.806	0	18
<b>LHOLD</b>	18.7	27.619	2	200
<b>HYV</b>	0.749	0.4342	0	1
<b>FERTI</b>	0.759	0.4282	0	1
<b>TRACT</b>	0.792	0.406	0	1
<b>LEVEL</b>	0.458	0.499	0	1
<b>LOTL</b>	0.551	0.498	0	1

**Table 5.2. Wheat Productivity Yield per Acre (In 40 Kg) By Farmer (%)**

Wheat Productivity Yield per Acre (In Mounds)	Farmer (Percentage)
25-35	16
36-45	40
46-55	41
56-65	3

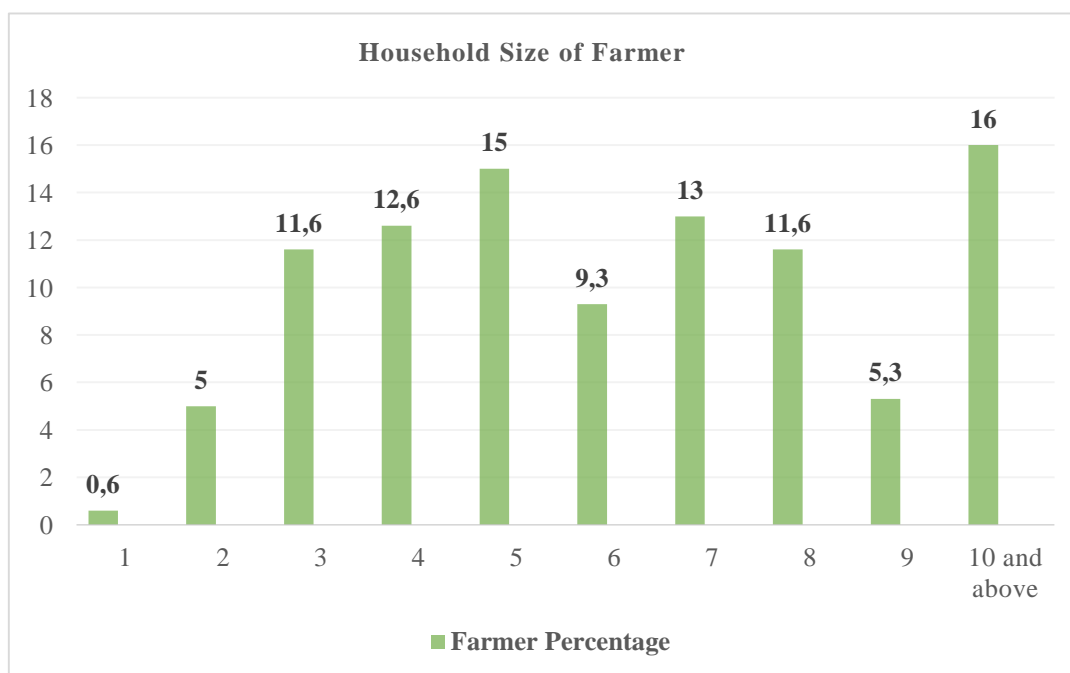


**Figure 5.1. Wheat Productivity Yield per Acre (40 Kg) By Farmer (%)**

The above table and diagram show the wheat productivity yield per acre. 16% of farmers receive 25-35 mounds of wheat per acre, and 40% receive 36-45 mounds of wheat per acre. Most farmers' wheat productivity is 46-55 mounds (40 kg) per acre. Only 3% of farmers' productivity is very high in our sample, meaning 56-65 mounds per acre.

**Table 5.3. Household Size By the Farmers (%)**

Family Size of the Farmer	Farmer (Percentage)
1	0.6
2	5
3	11.6
4	12.6
5	15
6	9.3
7	13
8	11.6
9	5.3
10 and above	16

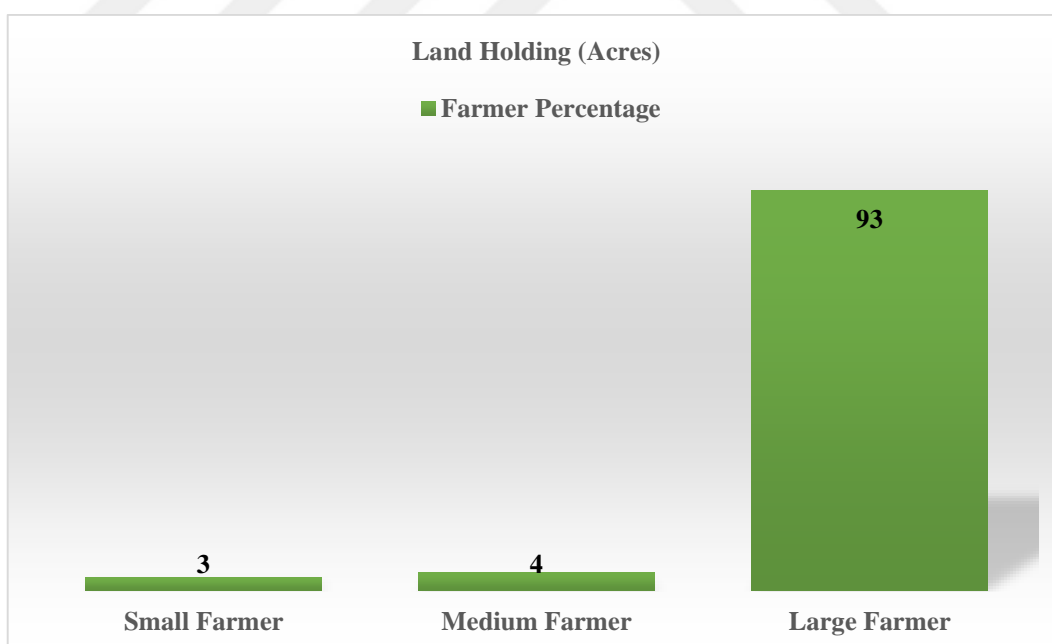


**Figure 5.2. Household Size By Farmers (%)**

The figure shows the household size of the farmers. Only 0.6% of farmers are single, 5% of farmers have two family members, 11.6% of farmers have three family members, 12.6% have four family members, 15% of farmers have five households' size, 9% of farmers have six family members, 13 % farmers have seven members 11.6 % have eight members, 5.3% have nine family members. A high percentage (16%) have ten and above family members.

**Table 5.4. Land Holding in Acres By Farmer (%)**

Land Holding (Acres)	Farmer (Percentage)
Small Farmer (1-6.25)	3
Medium Farmer (6.25-12.5)	4
Large Farmer (12.5 and above)	93

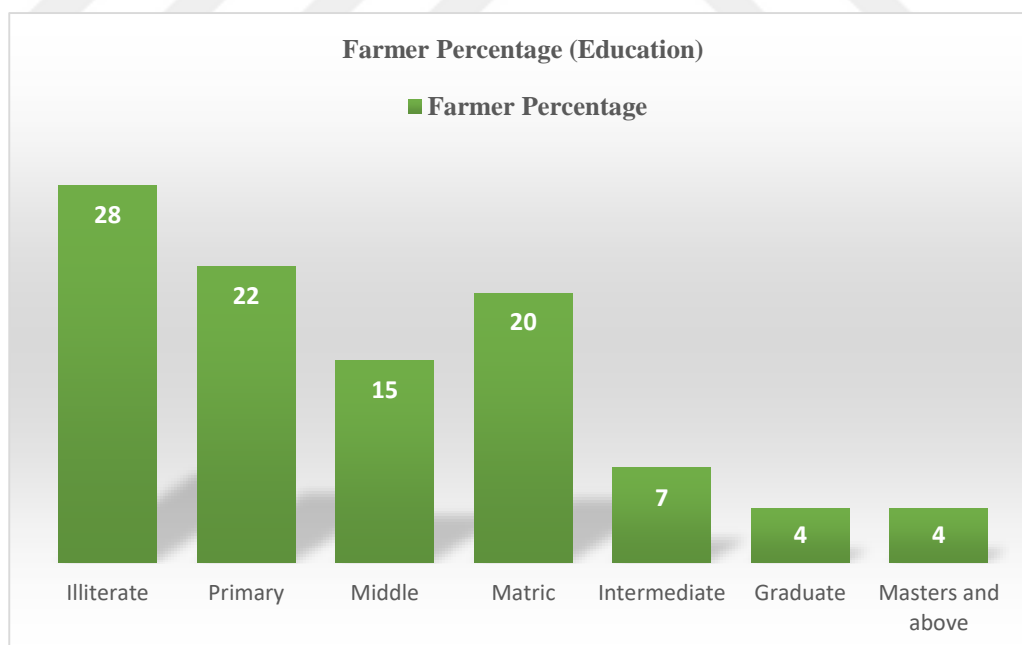


**Figure 5.3. Land Holding in Acres By Farmer (%)**

Landholding in acres is given on X-axis, and farmer Percentage is provided on the Y-axis. The above table and figure show that 3% of a farmer have 1-6.25 acres of land, 4% have 6.50-12.50 acres of land, and 93% have 13 and above acres of land.

**Table 5.5. The Farmer's Level of Education**

Years of Schooling	Farmer (Percentage)
Illiterate	28
Primary	22
Middle	15
Matric	20
Intermediate	7
Graduate	4
Masters and above	4

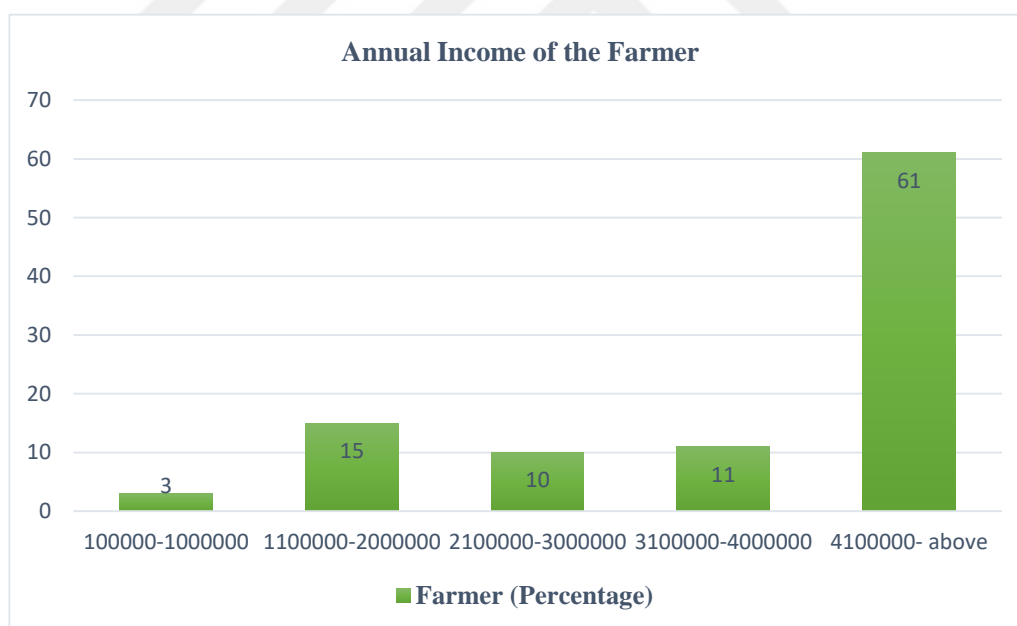


**Figure 5.4. Farmer's Level of Education**

The above graph shows that most farmers (28%) are illiterate, and 22% have primary education. The percentage of the middle Farmer is 15; the Matric pass is 20; the intermediate pass is 7 and, only 4% of the farmers are graduates, and 4% are Master's and above.

**Table 5.6. Annual Income of the Farmer and Farmer (%)**

Annual Income of the Farmer (Rupees)	Farmer (Percentage)
100000-1000000	3
1100000-2000000	15
2100000-3000000	10
3100000-4000000	11
4100000- above	61



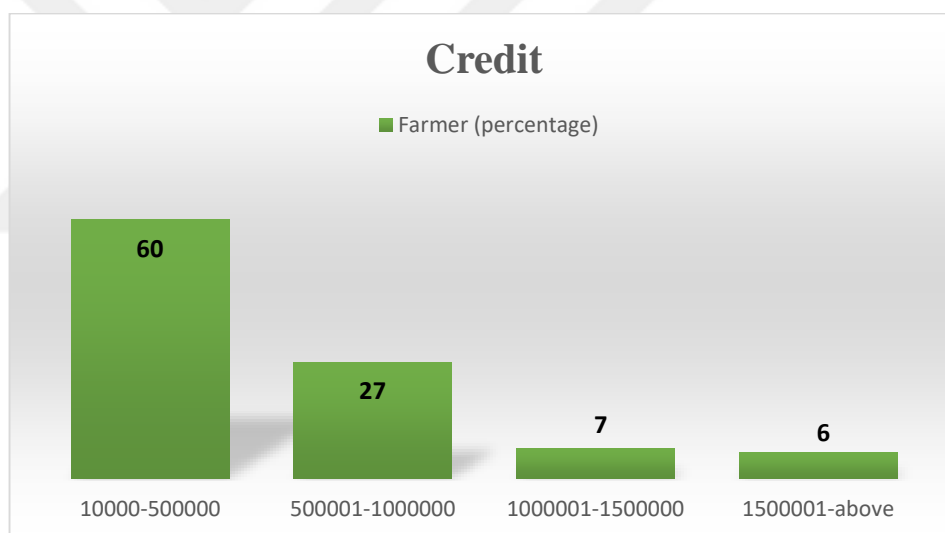
**Figure 5.5. Annual Income of the Farmer (%)**

The above table and figure 5.5. show annual income in rupees per year against farmer percentage. Most farmers (61%) have an annual income of 4100,000 and above. 11% of the farmers have an annual income 3100000-4000000, 10 % farmers have annual

income of 2100000-3000000, 15% of the farmers have 1100000-2000000, and only 3% of farmers have annual revenue of 100000-1000000 rupees.

**Table 5.7. Credit and Farmer (%)**

Credit (Rupees)	Farmer (percentage)
10000-500000	60
500001-1000000	27
1000001-1500000	7
1500001-above	6



**Figure 5.6. Credit and Farmer (%)**

The above figure indicates that 60% of farmers get the 10000 to 500000 rupees credit, 27% of farmers get the 500001-1000000 rupees amount of credit, 7% get the 1000001-1500000 (rupees) amount of credit, and 6% of farmers get the 1500001-and above (rupees) amount of credit.

## 5.2. Analysis of Regression Results

In this section, we can find the results of linear estimates of Regression Analysis which are explained in the table below.

**Table 5.8. Linear Estimates of the Regression Analysis**

Explanatory variable	Coefficient	Std. Error	t-statistic	Prob <sup>25</sup> .
C	32.983	0.730	45.180	0.000
EDU	0.068	0.053	1.290	0.200
LHOLD	-0.019	0.009	-2.020	0.045
HYV	8.164	1.476	5.530	0.000
FERTI	2.653	1.520	1.750	0.082
TRACT	2.284	0.795	2.870	0.004
LEVEL	1.241	0.549	2.260	0.024
LOTL	2.634	0.534	4.930	0.000
<b>R- Squared</b>				
<b>Adjusted R- Squared</b>				
<b>N</b>				
<b>F- Statistics</b>				
<b>P value</b>				
0.654	0.645	299	78.41	0

The regression analysis indicates the coefficient of education is 0.068, which suggests that a one-level increase in education will increase wheat productivity by 0.068 times. The probability value of this variable is 0.200, which shows that the education variable is statistically insignificant. The influence of education on agricultural productivity has been found insignificant or even negative in various cross-country analyses Reimers & Klasen (2013).

The coefficient of landholding is -0.01885, which indicates that a one-unit increase in landholding will decrease wheat productivity by 0.0188 times. The probability value of this variable is 0.045, which shows that the landholding variable is statistically significant at a 5% level of significance. As the farm area increases, inputs like labour, fertilizers, pesticides, and other inputs start becoming less proportionally, and the

<sup>25</sup> probability

farmer realizes low productivity. Zuberi (1989) and Qureshi and Shah (1992) verified these outcomes with different forecasting techniques. Land ownership has reverse signs. The large holding area creates unproductivity in farms. A sizeable operational area impacts farm productivity Vollrath (2007) significantly negatively. Manjunatha (2013) found a negative association between land segmentation and farm productivity. Small farms seem to be more productive than large farms.

The coefficient of high-yielding varieties is 8.16, which indicates that a one-unit increase in high-yielding types will increase wheat productivity by 8.16 times. The probability value of this variable is 0.000, which shows that the high-yielding varieties variable is statistically highly significant. It is proven that if the farmer uses quality seeds, his productivity will show exponential growth, as we have witnessed in our results. Rehman et al. (2019) found a positive association between fertilizer use and high-yielding varieties on agricultural productivity.

The coefficient of fertilizer is 2.6534, which indicates that a one-unit increase in fertilizer will increase wheat productivity by 2.65 times. The probability value of this variable is 0.082, which shows that the fertilizer variable is statistically highly significant. According to Zuberi (1989), financing high-quality seeds and fertilizer have a positive impact on agricultural productivity. Fertilizers are one of the main inputs used to obtain high and fast rates of agricultural return Rehman et al. (2019).

The coefficient of the tractor is 2.28, which indicates that a one-unit increase in a tractor will increase wheat productivity by 2.28 times. The probability value of this variable is 0.004, which shows that the tractor variable is statistically highly significant. Qureshi and Shah (1992) found that institutional loans positively impact the agricultural outcome by funding working capital investments like mechanical instruments.

The coefficient of the leveller is 1.24, which indicates that a one-unit increase in the leveller will increase wheat productivity by 1.24 times. The probability value of this variable is 0.024, which shows that the leveller variable is statistically highly significant. Mechanical technology like tractors and other implements improves

agricultural productivity, increasing the gross national product (Self and Grabowski, 2007).

The coefficient of a long-term loan is 2.63, which indicates that a one-unit increase in the long-term loan will increase wheat productivity by 2.63 times. The probability value of this variable is 0.000, which shows that the long-term loan variable is statistically highly significant. As we discuss the impact of financing on agricultural productivity, we have witnessed this in our results. If the farmers get the loan on time and use quality inputs, the outcome will be very impressive. Formal agricultural finance has significantly impacted agricultural productivity in Pakistan Iqbal et al. (2003). Credit distribution positively and significantly impacted agricultural gross domestic product Rehman et al. (2019).

To sum up, the analysis indicated that both the usage of credits and the adoption of technology affect wheat productivity positively.

## CHAPTER VI

### CONCLUSION AND POLICY RECOMMENDATIONS

Considering the importance of wheat productivity and technological advancement, this study has tried to analyze the impact of ZaraiTaraqiati Bank Limited's role on technology adoption using OLS analysis of primary data sets. We tried to find out the advantages of various types of loans or credit provided by ZaraiTaraqiati Bank Limited to farmers. We also conducted a descriptive analysis of the socio-economic attributes of farmers. We analyzed the impact of the usage of technological advancement developed by ZaraiTaraqiati Bank Limited on wheat production. The findings of the empirical analysis are as follows.

It has been empirically investigated that long-term credit is positively associated with agricultural productivity. Credit allows farmers to procure high-quality seeds, fertilizers, and pesticides, and agricultural productivity increases with such well-timed and proficient inputs. Credit availability leads to increased liquidity and increases the farmer's purchasing power, which positively affects productivity. An increase in earnings leads to an improvement in the standard of living. Higher quality and quantity of inputs of seeds, fertilizers, and pesticides increase the farmer's productivity, which in turn increases productivity. Long-term loans (LOTL) also have a significant positive role in agricultural productivity. Long-term loans positively impact productivity because farmers can purchase equipment, tube wells, tractors, etc. Agricultural productivity increases with farm mechanization and the adoption of better production techniques. Farmer's land ownership significantly impacts wheat productivity, and an increase in farmers' land ownership will reduce wheat production.

High-yielding varieties, fertilizers, tractors, and levelling machines significantly positively affect wheat productivity. An increase in the coefficient values of these variables leads to an increase in wheat productivity and agricultural productivity increases with farm mechanization and the adoption of better production techniques.

In the agricultural economy, the financing by the ZTBL to support technology adoption by the farmers causes an increase in agricultural productivity, ultimately resulting in a higher income level. The findings of the study have some policy implications. The Government should provide loans to strengthen the technological infrastructure and loans in kind in the form of seeds, fertilizers, pesticides, etc, for the maximum number of farmers rather than in the form of cash. The Government should provide long-term loans in large proportions, which causes the technology adoption by large numbers of the farmer, and ultimately wheat production will increase. ZTBL should prioritize providing loans to the most commonly used food crops like wheat and rice because these are essential to a normal. Government should increase the agro-based industries to reduce the dependency burden of the farmer and surplus labour, which increases agricultural productivity, especially wheat. The timing of the loan provider is crucial as every crop has a suitable cultivation season and period. So, if farmers could not secure funding on time, then the impact of the loan would not achieve the required result. So, the Bank should give specific attention to this aspect. The agricultural sector is vital for fulfilling basic human needs like food. So, there should be subsidized interest rates for farmers. Especially if the goal is to reduce poverty, small farmers should have access to loans at reasonable costs.

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# APPENDIXES

## APPENDIX A

### **The Role of ZTBL Finance on Adaptation of Modern Technology in Wheat Production:**

#### **A Case Study of Bahawalpur District**

##### Questionnaire for Framer

- Q.1 Name .....
- Q.2. a) Age of Respondent (in Years) .....
- b) Family Size.....
- Q.3. Years of Schooling/Education .....
- Q.4. Farming Experience .....
- Q.5 Land Holding (in Acres) .....
- a) Small farmer (upto 6.25 acres)
- b) Medium Farmer (upto 12.5 acres)
- c) Large farmer (above 12.5)
- Q.6 Total Annual income (approximately)\_\_\_\_\_
- Q.7 Total amount of loan \_\_\_\_\_ Rupees
- Q.8 Productivity per Acre before taking loan\_\_\_\_\_
- Q.9 Productivity per Acre after taking loan\_\_\_\_\_
- Q.10. Did you use productivity-increasing inputs like hybrid seeds/high-yielding varieties?
- Yes \_\_\_\_\_ No \_\_\_\_\_
- Q.11. Did you use produce increasing inputs like Fertilizer?
- Yes \_\_\_\_\_ No \_\_\_\_\_
- Q.12. Did you use produce increasing inputs like pesticides and herbicides?
- Yes \_\_\_\_\_ No \_\_\_\_\_
- Q. 13. Did you possess the Tractor, rigger, rotavator, and other attachments?
- Yes \_\_\_\_\_ NO \_\_\_\_\_

Q. 14. Did you possess the Tube well/turbine?

Yes \_\_\_\_\_ NO \_\_\_\_\_

Q. 15. Did you possess the land leveller?

Yes \_\_\_\_\_ NO \_\_\_\_\_

Q. 16. Did you possess the combine harvester?

Yes \_\_\_\_\_ NO \_\_\_\_\_

Q.17. Which type of loan you borrowed?

- i. Short term
- ii. Medium-term
- iii. Long term

Q.18. In which form have you taken the credit?

a) In Cash \_\_\_\_\_ b) In Kind \_\_\_\_\_

Q.19. Do you get technical know-how, along with the credit from a bank?

Yes \_\_\_\_\_ No \_\_\_\_\_

APPENDIX B

گندم کی پیداوار میں جدید ٹیکنالوجی کے موافقت پر ZTBL فنانس کا کردار  
ضلع بہاولپور کا کیس سٹڈی  
فریئر کے لیے سوالنامہ

- سوال 1- نام \_\_\_\_\_
- سوال 2 (اے)- جواب دہندہ کی عمر (سالوں میں) \_\_\_\_\_
- سوال 2 (ب)- خاندانی سائز \_\_\_\_\_
- سوال 3- اسکولنگ / تعلیم کے سال \_\_\_\_\_
- سوال 4- کاشتکاری کا تجربہ \_\_\_\_\_
- سوال 5- زمین ہولڈنگ (ایکڑ میں) \_\_\_\_\_
- (اے) چھوٹے کسان (16.25 ایکڑ تک)
- (ب) متوسط کسان (12.5 ایکڑ تک)
- (سی) بڑا کسان (12.5 سے اوپر)
- سوال 6- کل سالانہ آمدنی (تقریباً) \_\_\_\_\_
- سوال 7- قرض کی کل رقم \_\_\_\_\_ روپے
- سوال 8- قرض لینے سے پہلے فی ایکڑ پیداواری صلاحیت \_\_\_\_\_
- سوال 9- قرض لینے کے بعد فی ایکڑ پیداواری صلاحیت \_\_\_\_\_
- سوال 10- کیا آپ نے بڑھتی ہوئی پیداوار کا استعمال کیا جیسے ہاہر ڈنچ / زیادہ پیداوار دینے والی اقسام؟  
ہاں \_\_\_\_\_ نہیں \_\_\_\_\_
- سوال 11- کیا آپ نے فرٹیلائزر جیسی پیداوار میں اضافے کا استعمال کیا ہے؟  
ہاں \_\_\_\_\_ نہیں \_\_\_\_\_
- سوال 12- کیا آپ نے کیڑے مار ادویات اور جڑی بوٹی مار ادویات جیسے پیداوار میں اضافے کا استعمال کیا؟  
ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

سوال 13- کیا آپ کے پاس ٹریڈنگ، ریگ، روٹ و پیٹر اور دیگر منسلکات تھے؟

ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

سوال 14- کیا آپ کے پاس ٹیوب ویل اثر بائن ہے؟

ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

سوال 15- کیا آپ کے پاس لینڈ لیور تھا؟

ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

سوال 16- کیا آپ کے پاس کمبائن ہارویسٹر تھا؟

ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

سوال 17- کیا نے کس قسم کا قرض لیا؟

(اے) کم وقت کے لیے

(ب) درمیانی مدت

(سی) طویل مدتی

سوال 18- جس شکل میں آپ نے کریڈٹ لیا ہے۔

(اے) کیش میں \_\_\_\_\_

(ب) قسم میں \_\_\_\_\_

سوال 19- کیا آپ کو بینک سے کریڈٹ کے ساتھ تکنیکی معلومات بھی ملتی ہیں؟

ہاں \_\_\_\_\_ نہیں \_\_\_\_\_

## CURRICULUM VITAE

### Personal Information:

Name - Surname: Muhammad Baqir

### Education:

2018-2022 MSc. in Financial Economics, Ibn Haldun University, Turkey

2015-2018 BSc. Economics, İstanbul Ticaret Üniversitesi, Turkey

2014-2018 BSc. Bankacılık ve Finans, İstanbul Ticaret Üniversitesi, Turkey

11/2013-08/2014 Turkish language proficiency Certificate, İstanbul Üniversitesi Dil Merkezi (Turkish), İstanbul

06/2007-06/2012 Fcs Pre-Engineering, Cadet College Skardu, Skardu, Pakistan.

### Experience:

07/2019-Present Accounts and Finance Manager, Muslim Hands Turkey, İstanbul

02/2019-08/2020 Research Assistant- Ibn Haldun University

01/2018-12/2018 Host and Interpreter, Mystaff, İstanbul

06/2017-12/2017 Intern at Takas bank İstanbul

07/2014-06/2016 Country representative president-Turkuaz International Students Association

### Voluntary Leadership:

04/2019 Bab-1 Alem International Students Organization – Country Representative for Pakistan

05/2016 Agha Khan Rural Support Program (AKRSP) – Social Mobilizer

03/2015 Banking and Finance Club – Istanbul Commerce University

### Activities:

2018 International Conference for İDSB

2018 Big Aid Convoy – Muslim Hands International

2017 39<sup>th</sup> Vodafone Istanbul Marathon

2016 3<sup>rd</sup> International Youth Camp, Çannakkale, Turkey.