Impact of Bai Salam Financing on Agro-Production Business: A Case Study of Faisalabad District, Pakistan

Hafiz Zahid Mahmood[1], Nasim Shah Shirazi[2], Imran Hameed Khaliq[3], Khalid Mahmood[4]

[1] COMSATS University Islamabad, Lahore Campus, [2] Hamd Bin Khalifa University, Doha Qatar
[3] University of Health Sciences, Lahore, Pakistan, [4]Rothamsted Research, England, UK

Received: June 16, 2022
Last revised: September 22, 2023
Accepted: November 26, 2023

Abstract

Agricultural financing is crucial in improving farm productivity and has various forms including institutional and noninstitutional financing. The Wasil Foundation has recently introduced Bai Salam, an Islamic agricultural financing method involving deferred delivery with upfront payment supporting small farmers and serving as a feasible alternative to conventional financing in Muslim-majority regions. This study examines the impact of Bai Salam, extended by the Wasil Foundation, on the wheat production business in the Faisalabad district. Data were collected from 90 Salam borrowers (intervention group) and 100 non-Salam farmers (control group) from the same area with similar/closely related attributes. A closed-ended questionnaire was used to gather information on sociodemographic indicators (age, education, family size, farm size) and farming attributes (cost of land preparation, labor, irrigation, chemicals, wheat output/acre). Descriptive analysis, t-tests, and multiple regression analysis were conducted to analyze the data. The study found significant differences between the intervention and control groups in input purchasing behaviors, output, revenue, and profits per unit area. Regression analysis revealed that Salam borrowers achieved significantly higher wheat output per acre (2.6 mounds) than the control group. Moreover, most control variables (age, education, family size) exhibited the expected relationships with farm productivity. These findings highlight the positive impact of Bai Salam financing and emphasize the importance of promoting it among policymakers and practitioners in the agricultural sector to achieve sustainable development goals in countries such as Pakistan.

Keywords: Agricultural credit, Small farmers, Bai Salam, Salam, Agro production business, Farm size, Impact assessment, Rural poverty, Input purchasing behavior, Islamic agriculture financing

Corresponding author: Dr. Hafiz Zahid Mahmood, drhafizzahid@cuilahore.edu.pk

1. Introduction

The agriculture sector is a pivotal economic development driver in many developing nations. Notably, according to the Food and Agriculture Organization (FAO), it is the primary source of income and employment for approximately two-thirds of the global population living in rural areas. In the case of Pakistan, agriculture assumes a central role in the country's economic landscape, contributing substantially (18.9%) to the GDP while engaging 42.3% of the labor force, thereby employing a profound impact on the growth of various sectors (Government of Pakistan, 2017-18).

Efficient utilization of agricultural resources is vital for advancing the farming sector as emphasized by the World Bank in its 2023 report. Interestingly, the provision of agricultural credit to small and marginal farmers is facilitated by the middlemen instead of financial institutions, as Chandio et al. (2018) highlighted. The prevalence of informal sources dominating the credit market directly results from the inadequacy of institutional and agricultural credit supply which currently addresses just a meager of the sector's credit requirements (Chandio, 2021). This striking imbalance requires a thorough analysis of financial mechanisms to bridge the credit gap and drive the agricultural sector towards sustainable growth.

Hidayat and Nur (2021) highlighted that middlemen involved in the agriculture commodities trade frequently utilize collateral and maintain robust relationships fostered by frequent transactions with major traders. These intermediaries possess valuable insights into local conditions, encompassing harvest timing, efficiency, yield, and farmers' reputation, rendering farmers a dependable investment option for middlemen. In the informal credit market, landlords are tenants' primary lending source, whereas small-scale farmers tend to depend more on middlemen for credit (Jaremski and Fishback, 2018).

Since its inception, informal lenders have held a crucial role in Pakistan's rural areas, providing cost-effective and efficient services that give them a clear advantage over the formal sector. As a result, low-income households predominantly rely on informal lenders. In contrast, affluent rural households enjoy better access to formal credit. The accessibility and efficiency of credit services vary based on the socioeconomic status of households in these regions (Asiamah et al., 2021).

Financial institutions, especially concerning small-scale farmers, have shown limited interest in the agriculture sector. The reluctance arises from the

challenges associated with the lack of collateral, elevated default risks, and increased transaction costs linked with small loans. In this context, microfinance institutions emerge as a viable solution for small farmers. These institutions efficiently cater to their financial needs, utilizing group-based financing to tackle the issue of higher transaction costs, while the presence of group guarantees helps mitigate the default risks (Zang et al., 2023).

In Pakistan, a significant imbalance in land distribution exists which is predominantly characterized by small-scale farming. According to the Pakistan Agricultural Census Report 2010 (Government of Pakistan, 2012), farms smaller than 5 acres make up the majority at 64% (5.35 million) of all private farms but contribute only 19% of the total farm area. Conversely, farms with 25 acres or more represent only 4% (0.30 million) of the total number of farms but encompass 35% of the overall farm area.

Financial institutions have traditionally overlooked lending to small-scale farmers due to concerns about their heightened default risks, limited collateral, and higher transaction costs associated with smaller loans (Zang et al., 2023). Koloma and Kemeze (2022) asserted that the agriculture sector is often perceived as having limited cash flow. However, Mahmood et al. (2014) identified a positive correlation between farm size and crop diversity underscoring the necessity for financial institutions to offer more accessible lending options to support small farmers. While only a handful of financial institutions cater to this sector, some nongovernmental organizations provide microfinance and microcredit services to assist small farmers in acquiring inputs and improving farm productivity. Moreover, specific organizations employ Islamic financing modes to serve individuals who prefer alternatives to formal financial institutions due to riba (interest) concerns.

Bai Salam, an Islamic agricultural financing method, functions as a deferred delivery contract, where full payment is made upfront at the agreement's time, with the commodity delivered in the future (Setiawan, 2022). Its primary objective is to assist small farmers lacking crop cultivation funds and day-to-day expenses until harvest. Consequently, Bai Salam presents a valuable alternative to conventional agricultural financing, particularly in Muslim-majority countries. Small farmers often steer clear of traditional financial institutions due to concerns about interest and loan terms that do not align with varying crop cash flow requirements (Maryam and Ahamad, 2021; Mhlanga, 2021).

It is evident from the literature that crop sales and purchases through the Bai Salam contract prove advantageous for both buyers and sellers (Putri et al., 2019; Hudaifah et al., 2019). This contract ensures transactions at current

market prices reducing the need for economic subsidies. Additionally, it provides forward sale contracts to mitigate future price volatility and stabilize the market. Moreover, another research emphasizes the significant role of middlemen as primary financiers in agricultural credit, meeting the needs of the majority of farmers (Maryam et al., 2022). However, this arrangement often leads to higher production costs for farmers and lower payment amounts when selling their output. In contrast, Bai Salam can function as a cost-saving tool, with many farmers believing that purchasing inputs through Bai Salam in cash can lead to savings of up to 25% (Kaleem & Ahmad, 2009). Therefore, there is a pressing need for further research to quantify these effects and delve deeper into the impact of Bai Salam on wheat producers in developing countries, particularly Pakistan.

The major objectives of the present study were to explore the influence of Bai Salam on farmers' input purchasing behavior, analyze the comparative costs and benefits of Salam and non-Salam wheat producers, and examine the relationships between demographic variables and wheat output. These objectives aimed to offer valuable insights into the influence of Salam financing on farmers' decision-making, the economic consequences of adopting Salam financing for wheat production, and the factors influencing wheat yield.

2. Methodology

This study was conducted in the Faisalabad district which was chosen as the location for the Bai Salam pilot project initiated by the Wasil Foundation. Faisalabad district spans an area of 5,856 square kilometers (Government of Punjab, 2019). According to the latest census report, the district has a total population of approximately 7.87 million, with approximately 48% residing in urban areas and 52% in rural areas (Government of Punjab, 2017). The reported land area of the district is 584 thousand hectares, with 474 thousand hectares dedicated to cultivation and 686 thousand hectares designated as crop areas. Wheat, a staple food, was cultivated on 301 thousand hectares in the 2015-16 season (Government of Punjab, 2017a). Furthermore, a significant majority of farmers (64%) fall into the small farm category, owning less than 5 acres of land, accounting for only 28% of the total farm area in the district (Government of Pakistan, 2010). Additionally, the district has a substantial saline area of 90.27 thousand hectares, with 1.77 thousand hectares suffering from waterlogging-induced degradation. Regarding land tenure, 81% of farms in the district are owned by individuals. In comparison, the remaining 19% are owned by a combination of owners and tenants or solely by tenants (Government of Pakistan, 2010).

The Faisalabad district, particularly near Dijkot City, served as the operational area for the Bai Salam initiative conducted by the Wasil Foundation. The foundation provided agricultural loans to approximately 106 clients residing in 12 villages, namely 264. RB., 267. RB., 270. RB., 272. RB., 274. RB., 275. RB., 276. RB., 277. RB., 278. RB., 280. RB., 281. RB., and 530. GB.

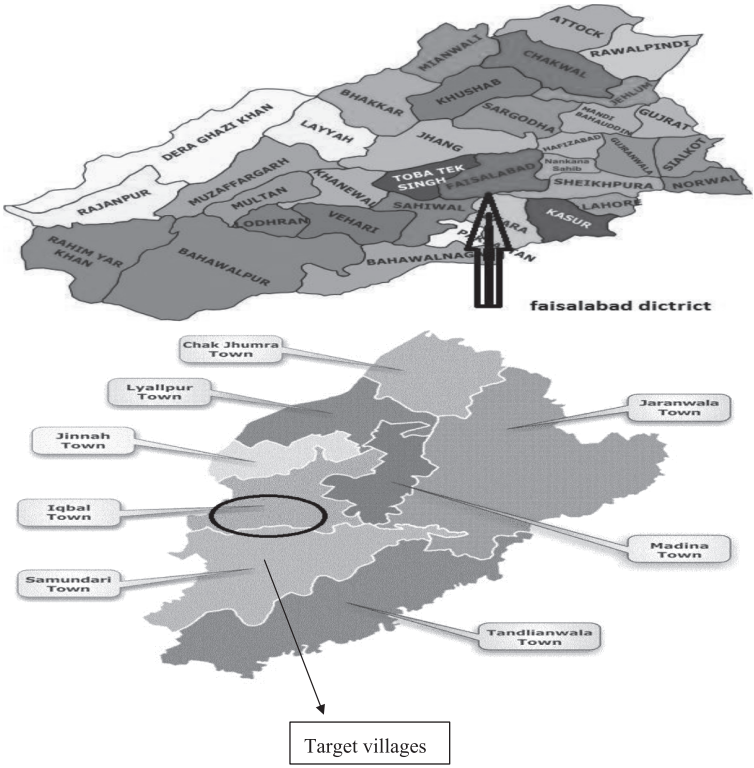

Figure 2.1. Map of Punjab with target district identification

Sample Size, Sampling Methods, and Data Gathering

For better and more reliable results, data were collected from the intervention group i.e., Salam clients and the control group i.e., farmers who did not borrow from the Wasil Foundation. Despite the will and efforts, the researchers could find only 90 Salam borrowers out of a list of 106. At the same time, data were collected from 100 non-Salam farmers from the same area with similar/closely related attributes. Therefore, purposive sampling was employed to select the farmers with similar attributes in this category. In addition, information was collected about the age and education of the household head, family size, farm size, loan size, costs of inputs (i.e., land preparation, labor, irrigation costs etc.), and wheat output from the study area. Moreover, data were also collected about

the input purchasing behavior on cash and credit from the market to quantify the difference between the intervention and control groups.

3. Data Analysis Techniques

Descriptive statistics was employed to explore the target respondents' demographics/socioeconomics and farming attributes. Moreover, comparing means to gauge differences in production costs, costs, benefits analysis etc., between two independent groups (i.e., Salam and non-Salam) was rendered using an independent sample t-test. Furthermore, multiple linear regression was also used to observe the impact of Salam/relationships between dependent and independent variables which are given as follows:

$$Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \epsilon$$

where Y = output/acre, β_0 = point of inception, X_1= age of household head, X_2 = education of household head, X_3 = family size, X_4 = dummy of loan (1, if farmer borrowed, 0 otherwise), X_5 = farm size, X_6 = land preparation cost/acre, X_7 = labor cost/acre, X_8 = irrigation cost/acre, X_9 = cost of chemicals/acre, ϵ = size of the error

3.1. Introduction and Lending Methodology of the Wasil Foundation

The Wasil Foundation is a nonprofit and nongovernmental organization (NGO) that has been working since 1992. Its main objective is to alleviate poverty by employing an enterprise development methodology to microfinance the target clients. Centre for Women Co-Operative Development (CWCD) converted its conventional microfinancing operations to Islamic microfinancing by restructuring itself with the new name of Wasil Foundation in 2009. Now, the Wasil Foundation offers various Islamic Microfinance products, including Bai Salam, for the farming community. This study is an impact assessment of its pilot project rendered in the Faisalabad district.

The Wasil Foundation used a streamlined framework for Salam financing. Loan applicants were required to present the 'fard' document as proof of land ownership. Additionally, borrowers needed to provide two passport-size photographs, a photocopy of their Computerized National Identity Card (CNIC), and a postdated cheque as a guarantee. A personal guarantor from the borrower's village was also needed, and a promissory note was signed as collateral.

The loan amount was determined based on the quantity of wheat that the borrower agreed to sell to the Wasil Foundation. According to the observations shared by the most of the borrowers, the organization set the wheat price

which was usually rupees (Rs.) 100 to 150 lower than the government's support price. After a few days, loan cheques were issued to the borrowers with a deduction of Rs. 1000 as a processing fee. These agreements were commonly entered into during October or November with repayment in the form of wheat crop to be harvested in the subsequent April and May.

4. Results and Discussion

4.1 Description Analysis

The descriptive analysis conducted in this study examines the differences in means between the intervention and control groups across various demographic, socioeconomic, farm, and farming attributes. Tables 1 and 2 provide detailed information on the demographic and socioeconomic characteristics and the farm and farming attributes of the target households respectively.

Table 4.1. Demographic and Socioeconomic Attributes of target Households

Variables	Mean ± SD	Min.	Max.
Age of household head (in years)			
Salam	49.55 ± 13.156	23.00	78.00
Non-Salam	54.77 ± 11.895	24.00	85.00
Overall	52.17 ± 12.77	23.00	85.00
Education level of household head (in years)			
Salam	7.73 ± 4.49	0.00	16.00
Non-Salam	6.55 ± 3.88	0.00	14.00
Overall	7.14 ± 4.23	0.00	16.00
Family size (in numbers)			
Salam	8.01 ± 3.17	2.00	20.00
Non-Salam	8.60 ± 3.74	3.00	24.00
Overall	8.31 ± 3.47	2.00	24.00
Percentage of breadwinners to household size			
Salam	32.06 ± 18.14	8.33	100.00
Non-Salam	30.05 ± 12.78	10.00	75.00

Overall	31.05 ± 15.67	8.33	100.00
Nonfarm income (in Rs.)			
Salam	22,633.33 ± 32,782.03	0.00	150,000.00
Non-Salam	25,296.70 ± 48,780.80	0.00	400,000.00
Overall	24,071.77 ± 41,476.77	0.00	400,000.00

The demographic analysis included examining the age, family size, and education level of the head of the family. In rural societies of Pakistan, agriculture-related decisions are predominantly made by males as the country follows a male-dominant social structure (Nosheen et al., 2008). Hence, all the respondents in this study were males. While there were differences in average age of the household heads and education level between the intervention and control groups; the observed similarities confirmed a fair comparison. Similar findings regarding the education of farmers were also reported in a study conducted in the Faisalabad district by Ayaz et al. (2011).

Furthermore, Table 1 also indicates that the average family size of the respondents in both the groups was similar with comparable values for minimum, maximum, and standard deviation. This resemblance could be attributed to the prevalence of joint family system which typically involves a larger number of family members. These findings aligned with a study conducted by Younus et al. (1999) in the central Punjab, Pakistan. Additionally, both target groups exhibited similar ratios of breadwinners to total family members. However, it is worth noting in Table 1 that the average nonfarm income of the control group slightly exceeded that of the intervention group. This could explain their reduced reliance on borrowing from the Wasil Foundation as they could access alternative resources.

4.2. Farm and Farming Attributes of Target Households

The results revealed that in Table 2, the control group farmers had smaller farm sizes on average measuring 8.11 acres as compared to the intervention group with an average of 11.98 acres. However, it should be noted that a lower number of larger farmers in the intervention group may have influenced this difference. Regarding land ownership, no significant variations were found in the average land size between the intervention group (7.51 acres) and the

control group (7.02 acres). The minimum and maximum landownership values were also found to be relatively close.

Furthermore, it was evident from Table 2 that both the intervention and control groups faced environmental challenges, such as land degradation caused by salinity and waterlogging. This issue was of significant concern in the study area as the ratios of land degradation to total farm area were similar in both categories. Therefore, based on the comparative descriptive statistics and analysis, it can be concluded that the intervention and control groups exhibited similarities that made their comparative analysis suitable for yielding reliable and generalizable results.

Table 4.2. Farm and Farming Attributes of Salam and non-Salam clients

Variables	**Mean ± SD**	**Min.**	**Max.**
Operational holdings (in acres)			
Salam	12.98 ± 11.67	2.00	65.00
Non-Salam	8.11 ± 7.73	1.00	50.00
Overall	10.54 ± 9.68	1.00	62.00
Land ownership holding (in acres)			
Salam	7.51 ± 9.17	1.00	65.00
Non-Salam	7.02 ± 8.10	1.00	50.00
Overall	7.26 ± 9.98	1.00	65.00
Farming experience (in years)			
Salam	30.155 ± 13.96	4.00	60.00
Non-Salam	34.68 ± 14.09	4.00	70.00
Overall	32.43 ± 14.17	4.00	70.00
Saline area to total farm size (in %)			
Salam	6.22 ± 9.22	0.00	50.00
Non-Salam	5.86 ± 7.97	0.00	45.00
Overall	6.04 ± 8.59	0.00	50.00
Waterlogged area to total farm size (in %)			

Salam	1.39 ± 4.88	0.00	25.00
Non-Salam	0.595 ± 4.28	0.00	37.50
Overall	1.00 ± 4.58	0.00	37.50

4.3. Loan Analysis

Among the 90 Bai Salam borrowers, 31% of the respondents were in their second turn while 69% were in their first term of borrowing. Figure 2 illustrates the demand and supply analysis for the loan amounts requested by Salam clients and provided by the Wasil Foundation respectively. The figure clearly shows that, on average, the target respondents received Rs. 54,325 out of their total demand of Rs. 62,580 from the Wasil Foundation. This indicated that, on average, each Salam client received 87% of the amount they had initially requested. Furthermore, the figure displays the minimum and maximum loan amounts demanded and supplied by the clients and lenders considering the borrowers' requirements and the lender's satisfaction.

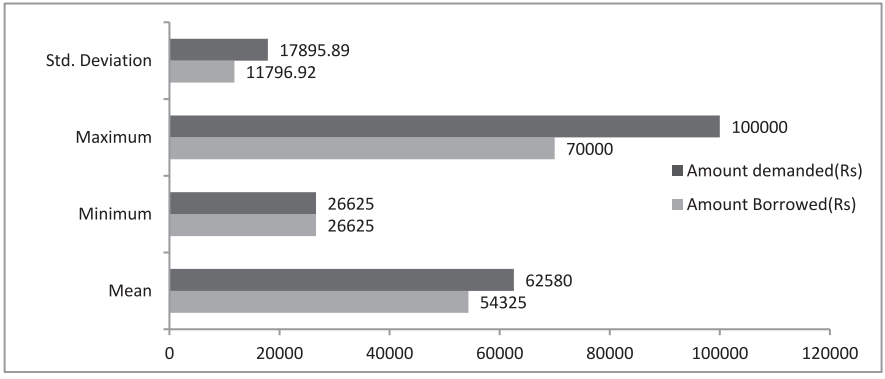

Figure 4.1. Salam borrowers/lenders: demand and supply analysis (in Rs.)

4.4. Purpose and Intended Utilization of the Loan

The purpose of this study revolved around the loan provided to Salam clients specifically for their wheat production to enable them to acquire the necessary inputs for cultivating their wheat farms more effectively. These loans were repaid by returning a predetermined quantity of wheat to the lending organization as per the agreed-upon contract between the two parties. Although the Wasil Foundation primarily utilized Salam financing for wheat crops, some clients also used the loan for other purposes.

Figure 3 provides supporting evidence that 41% of the respondents utilized the borrowed amount solely for wheat production. However, 58% of Salam clients

used the loans partially for their intended purpose. In comparison, 1% utilized the loan amount for purposes other than wheat production. Furthermore, Figure 4 displays the areas where the borrowed funds were utilized for purposes other than wheat production. Among the farmers who used a portion of the loan for purposes other than intended, the majority (70%) allocated the borrowed funds for domestic consumption. Additionally, 16.98% utilized the money to produce other crops, 11.32% for purchasing assets, and 1.89% for education of their children. Given that most farmers belong to smaller farm categories, the predominant misuse of borrowed funds is directed towards domestic expenditures as compared to other categories of misutilization.

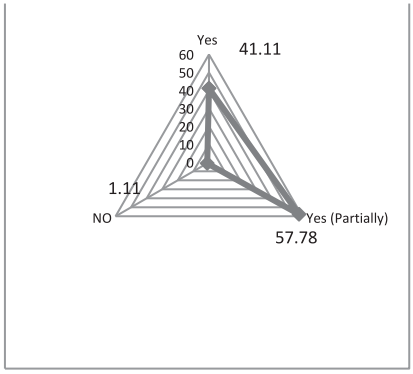

Figure 4.2. Purposeful Use of Loan (in %)

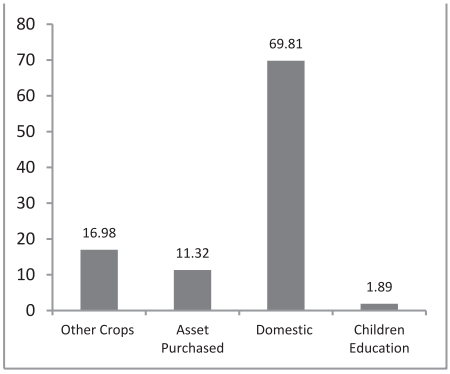

Figure 4.3. Use of Loan Other than Purpose (in %)

4.5. The Ratio of Wheat to Total Farm Area

Wheat is prominent in the agricultural landscape of Pakistan and is consumed as a staple food by the population. It plays a vital role in agricultural policies. It contributes significantly to the country's agricultural and overall GDP accounting for 9.1% and 1.7% respectively (Government of Pakistan, 2017-18). With its cultivation spanning various cropping zones, wheat is crucial in combating mass food insecurity. Considerable research efforts have been undertaken worldwide, including in Pakistan, to enhance wheat production and introduce new varieties to improve productivity. In the light of the significance of wheat production, this study specifically investigated the ratio of wheat-producing area to the total farm area for both the intervention and control groups. Surprisingly, the findings revealed that approximately 67% of the total farm area was dedicated to wheat cultivation by both target groups. Furthermore, the standard deviation values aligned indicating consistency in this aspect (Table 3).

Table 4.3. The Ratio of Wheat to Total Farm Area (in %)

Variables	Mean ± SD	Min.	Max.
Salam	67.10 ± 14.85	20.00	100.00
Non-Salam	66.56 ± 13.74	16.67	93.75
Overall	66.83 ± 14.27	16.67	100.00

Considering the significance of wheat crops in Pakistan, farmers often face the challenge of acquiring inputs through cash payments or credit due to limited financial resources. Figure 5 presents the percentage of farmers in the intervention and control groups who purchased wheat inputs on cash to shed light on this aspect. The figure indicates that more Salam farmers opted for cash purchases of inputs including seed, fertilizers, fuel, and weedicide than non-Salam farmers in the study area. Notably, the most significant difference was observed in the case of cash purchases of fertilizers between the intervention and control groups. This disparity could be attributed to farmers' sensitivity regarding chemical fertilizers compelling them to procure these inputs regardless of their financial resources. On the other hand, the slightest difference was observed in the cash buying of wheat seed in the study area. Hence, it was concluded that Bai Salam financing facilitated wheat farmers in affording cash purchases of inputs from the market distinguishing them from non-Salam farmers in the study area.

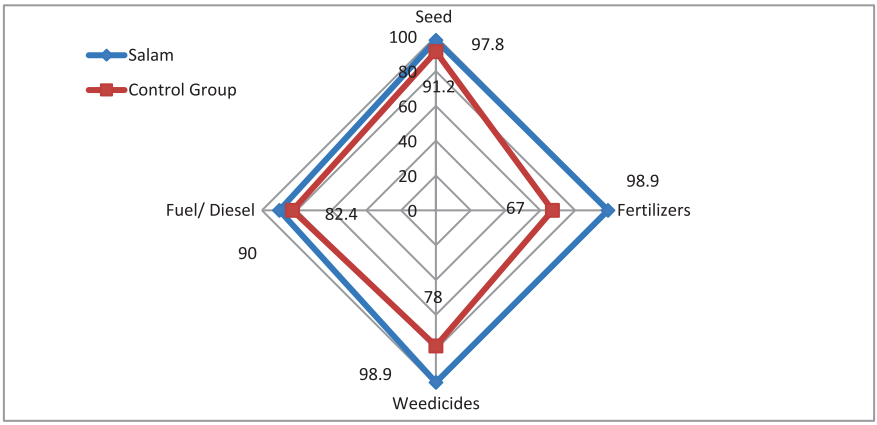

Figure 4.4. The input purchasing behavior of target groups (in %)

4.6 Cost-Benefit Analysis

This section presents the findings related to cost-benefit ratios - an analysis commonly used to assess the benefits of a specific commodity. Tables 4 and 5 provide insights into the average costs and benefits associated with wheat production for the Salam and control groups, respectively. Table 4 indicates that Salam respondents incurred higher costs for most wheat production inputs than the control group farmers. However, the independent sample t-test results did not reveal any significant difference. It is worth noting that Salam farmers had higher land preparation and labor expenses. In contrast, there was a significant difference in the cost of irrigation and chemicals for wheat cultivation. Additionally, the overall production costs between the two groups were statistically significant in the study area.

Table 4.4. Salam and non-Salam Groups Based Comparison of Wheat Cost of Production per acre

Variable	Mean (Salam)	Mean (Non-Salam)	Mean difference	t- test	
				t value	p-value
Cost of land preparation	6614.72	6399.27	215.45	1.070	0.286
Cost of labor	249.41	237.74	11.67	0.162	0.872
Cost of irrigation	2343.44	3028.79	685.35	-2.272	0.024
Cost of chemicals	8140.00	6364.07	1775.93	7.548	0.001
Other costs	7104.17	9735.17	369.00	-	-
The total cost of production	24451.74	22765.04	1686.71	3.206	0.002

Based on the results of the independent sample t-test, it was evident from the Table 5 that Salam farmers incurred an average cost of Rs 24,452 per acre for wheat production, while non-Salam farmers incurred approximately Rs 22,765 per acre. On the revenue front, Salam clients generated an average of Rs 49,892 per acre; whereas, non-Salam farmers generated approximately Rs 44,041 per acre.

Analyzing the profit margins of the intervention and control groups, it was observed that Salam clients achieved higher profits per acre (Rs 25,440.72) than

non-Salam farmers (Rs 21,275.74). Furthermore, the cost-benefit ratios indicated that Salam farmers earned Rs 2.04 for every rupee invested in wheat production. In contrast, non-Salam farmers earned Rs 1.93 for each rupee invested in their wheat farms. Notably, all the indicators related to the costs and benefits analysis were statistically significant, as indicated in Table 5.

Table 4.5. Costs and Benefits Analysis of Target Wheat Growers

Variable	Mean (Salam)	Mean (Non-Salam)	Mean difference	test-test	
				t-value	p-value
Cost of production/acre (in Rs.)	24,451.74	22,765.04	1,686.71	3.206	0.002
Yield per acre (mounds/acre)	42.92	36.96	5.97	5.400	0.001
Revenue (Rs./acre)	49,892.46	44,040.78	5,851.68	4.404	0.001
Profit (Rs./acre)	25,440.72	21,275.74	3,772.77	3.460	0.001
Cost Benefit Ratio (in Rs.)	2.04	1.93	-	-	-

The profit earned by non-Salam clients amounted to Rs. 21,275 which fell short by Rs. 4,165 as compared to Salam respondents. It is worth noting that Salam clients sold a portion of their wheat at a price lower than the market rate to the Wasil Foundation.

4.7. Regression Analysis

This section presents the findings of a multiple linear regression model that investigated the relationship between various variables and the output level of wheat production. The analysis included factors such as the age and education of the household head, family size, loan status, farm size, land preparation cost per acre, labor cost per acre, irrigation cost per acre, and chemical cost per acre as independent variables. The R-square value, which indicates the proportion of the dependent variable's variation explained by the independent variables, was calculated to be 0.42. This suggests that approximately 42% of the variability in wheat yield per acre can be attributed to the examined independent variables.

Since multiple factors influence low output, it is expected that only a few variables cannot fully explain the yield per acre. The model's F value was 13.74

with a p-value of 0.001 indicating that the model is significant at the <1% level. Out of the nine predictors examined, four variables namely the age of the household head, family size, farm size, and irrigation cost showed a negative relationship with the output. On the other hand, the remaining five variables showed a positive relationship with output. For instance, the constant value of 4.650 suggested that when there were no changes in the independent variables, the expected output was approximately 4.650 mounds per acre.

Table 4.6. Trends in Wheat yields

Indicator	**β**	**p-value**	**Collinearity Statistics**	
			Tolerance	**VIF**
Constant	4.650	0.402		
Age of household head	-0.032	0.523	0.697	1.435
Education of household head	0.131	0.385	0.686	1.458
Family size	-0.034	0.837	0.858	1.166
Dummy of loan	2.597	0.045*	0.671	1.490
Size of farm	-0.078	0.198	0.825	1.211
Land preparation cost	0.208	0.001**	0.918	1.089
Labor cost	0.084	0.464	0.913	1.096
Irrigation cost	-0.054	0.045*	0.925	1.081
Chemical cost	0.268	0.001**	0.724	1.381
F = 13.74				
R-squared value = 0.42				
* Statistically significant at p < 0.01				
** Statistically significant at p < 0.01				

The econometric model results also indicated that the age of household heads was not statistically significant. Based on the regression model, it was estimated that a one-year increase in the age of the household head would result in a decrease of 0.032 mounds in wheat output per acre. This suggested that older farmers had lower output per acre possibly due to a lack of energy and flexibility in adopting modern farming technologies. In contrast, younger farmers were more energetic and were likely to adopt innovative techniques

leading to higher output. Although the education of the household head was not statistically significant, it showed a positive relationship with the dependent variable. While traditional agricultural practices may not require formal education, modern farming techniques often demand specialized skills and knowledge. Hence, there was a positive association between education and wheat yield.

The inclusion of a dummy variable representing the presence of a loan (coded as 1 for "Yes" and 0 for "No") showed a significant association (p-value = 0.045) with wheat output per acre. This finding indicates that farmers who availed of Salam loans demonstrated higher production levels than the control group (Table 6). This finding was consistent with previous research on conventional credit, highlighting the positive impact of funding availability on smaller farmers' ability to utilize timely inputs and achieve better output—furthermore, the negative relationship between farm size and the dependent variable was found in line with the literature. Larger farm sizes have been found to have a negative effect on output in previous studies.

The cost of land preparation showed a positive association with wheat output indicating that a higher investment in land preparation resulted in a significant increase in wheat yield (0.208 mounds) per unit. This relationship was statistically significant at a confidence level of less than 1 per cent. Several factors including proper land preparation, utilization of high-quality seeds, and the application of farmyard manure were identified as contributors to the positive association observed. These findings are aligned with a previous study by Bashir et al. (2010) conducted in the Lahore region that also found a significant positive correlation between land preparation cost and wheat production using the Cobb Douglas production function.

In contrast, the cost of irrigation showed a negative relationship with wheat output. A one-unit increase in irrigation cost was associated with a decrease in wheat output by 0.054 mounds per acre (p-value < 5%). These results differed from those of other studies, but the brackish underground water in the study area could justify them. Farmers who relied heavily on tube-well irrigation may have incurred higher costs but achieved lower output due to the adverse effects of brackish water. Thus, an increase in irrigation cost led to a decrease in wheat output. Finally, the cost of chemicals exhibited a highly significant (p-value = 0.001) positive relationship with output. This included the expenses related to plant protection through the use of weedicides and pesticides and the cost of micro- and macronutrients. These findings get aligned with Bashir et al. (2010) who observed the impact of credit on wheat production in the Lahore region and found that the utilization of nutrients positively influenced wheat yield.

Conclusion

The Wasil Foundation's Salam financing primarily targets small farmers, but it falls short of reaching the poorest of the poor. The financing is provided on an individual basis with collateral requirements and a reasonable profit charge. While intended for wheat production, farmers often use the funds for other purposes mainly daily expenses. Significant differences were found in the input purchasing behavior with Salam clients more likely to buy inputs in cash. The cost of irrigation was notably higher for non-Salam clients due to the unsuitability of underground water. Cost and benefit analysis revealed significant disparities in production costs, output levels, revenues, and profits between Salam and non-Salam clients. Multiple linear regression showed that loans, the cost of land preparation, and the cost of chemicals significantly impacted wheat output, while irrigation costs had a negative effect. Finally, it is suggested that the policymakers should promote Bai Salam to support small farmers, enhance productivity, and address poverty and food security challenges.

References

Akram, W., Sial, Z., & Ijaz. (2008). Agricultural credit constraints and borrowing behavior of farmers in rural Punjab. *Euro. J. Sci. Res. 23*(2), 294-304.

Asiamah, T. A., Steel, W. F., & Ackah, C. (2021). Determinants of credit demand and credit constraints among households in Ghana. *Heliyon, 7*(10), e08162.

Ayaz, S., Anwar, S., Sial, M.S. & Hussain, Z. (2011). Role of agricultural credit on production efficiency of farming sector in Pakistan- A data envelopment analysis. *Pak. j. life soc. Sci. 9*(1), 38-44

Bashir, M.K., Mehmood, Y. & Hassan, S. (2010). Impact of agricultural credit on productivity of wheat crop: evidence from Lahore, Punjab, Pakistan. *Pak. J. Agri. Sci., Vol. 47*(4), 405-409. *ISSN (Print) 0552-9034, ISSN (Online) 2076-0906*
http://www.pakjas.com.pk

Chandio, A.A., Jiang, Y., Rehman, A., Twumasi, M.A., Pathan, A.G. & Mohsin, M. (2021). Determinants of demand for credit by smallholder farmers': a farm level analysis based on survey in Sindh, Pakistan. *Journal of Asian Business and Economic Studies, 28*(3), 225-240.

Chandio, A.A., Jiang, Y., Wei, F. & Guangshun, X. (2018). Effects of agricultural credit on wheat productivity of small farms in Sindh, Pakistan: Are short-term loans better?. *Agricultural Finance Review, 78*(5), 592-610.

Coleman, B.E. (2006). Microfinance in Northeast Thailand: who benefits and how much? *World Development, 34*(9), 1612-1638.

DOI:10.1080/09540105.2015.1079593

Elhendy, A.M & Alkahtani, S.H. (2013). The Resource Use Efficiency of Conventional and Organic Date Farms in Saudi Arabia: A Data Envelopment Analysis Approach. *The J. Anim. and Plant Sciences, 23* (2), 596-602 ISSN: 1018-7081

Government of Pakistan (2012). Pakistan Agriculture Census Report. Federal Bureau of Statistics. Statistics Division: Ministry of Economic Affairs and Statistics, Islamabad, Pakistan.

Government of Pakistan (2017-18) Economic Survey of Pakistan 2017-18. Ministry of Finance, Islamabad, Pakistan.

Government of Punjab (2017) "District and Tehsil Lelvel Population Summary with Region Breakup"

Government of Punjab (2017a) Punjab Development Statistics 2017. Punjab Bureau of Statistics, Govt. of Punjab

Government of Punjab (2019) "Faisalabad District at a Glance". Punjab Bureau of Statistics, Govt. of Punjab. http://www.pbs.gov.pk/content/district-glance-faisalabad visited on March 7, 2019

fiz Zahid Mahmood, Sana Iftikhar, Abdul Saboor, Atta Ullah Khan & Muhammad Khan (2015): Agriculture land resources and food security nexus in Punjab, Pakistan: an empirical ascertainment. Published Food and Agricultural Immunology,

Hidayat, Y., & Nur, R. (2021, February). *Trust and Ethics in the Social Network of Oil Palm Traders: Lessons From Indonesia*. In 2nd International Conference on Social Sciences Education (ICSSE 2020) (pp. 352-357). Atlantis Press.

Houtman, R.C. (2006). *Financing seasonal crops: a proposal for Bai Salam in Afghanistan.* Project Discussion Paper 19, Department for International Development, Food and Agriculture Organization of the United Nations, Geneva.

http://www.pbscensus.gov.pk/sites/default/files/bwpsr/punjab/FAISLABAD_SUMMARY.pdf

Hudaifah, A., Tutuko, B., & Tjiptohadi, S. (2019). The implementation of Salam-contract for agriculture financing through Islamic-Corporate social responsibility (case study of paddy farmers in Tuban regency Indonesia). *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah, 11*(2), 223-246.

Jaremski, M., & Fishback, P. (2018). Did Inequality in Farm Sizes Lead to Suppression of Banking and Credit in the Late Nineteenth Century? *The Journal of Economic History, 78*(1), 155-195.

Kaleem, A. (2009). Application of Islamic banking instrument (Bai Salam) for agriculture financing in Pakistan. *British Food Journal, 111*(3), 275-292.

Kiani, A. K. (2008). Farm Size and Productivity in Pakistan. *European J. Social Sciences 7*, 42-52. Department of Economics, Federal Urdu University of Arts. Science and Technology, Islamabad, Pakistan.

Koloma, Y., & Kemeze, F. H. (2022). COVID-19 and perceived effects on agricultural financing in Africa: Evidence and policy implications. *African Development Review, 34*, S63-S79.

Mahmood, H. Z., Qasim, M., Khan, M and Husnain, M. I. U (2014) R-examining the inverse relationship between farm size and productivity in Pakistan. Published in The Journal of Animal & Plant Sciences, 24 (5): Page 1537-1546.

Maryam, S. Z., & Ahamad, D. A. (2021). Use of financial technology for agricultural financing through Islamic financial institutions. *International Journal of Business and Economic Affairs, 6*(6), 1-10.

Mhlanga, D. (2021). Financial inclusion in emerging economies: The application of machine learning and artificial intelligence in credit risk assessment. *International Journal of Financial Studies, 9*(3), 39.

Nosheen, F., Ali, T., Ahmad, M., & Nawaz, H. (2008). Exploring the gender involvement in agricultural decision making: a case study of district Chakwal. *Pak. J. Agri.* Sci, 45(3), 101-106.

Nouman, M., Siddiqi, M.F. & Hussain, Z. (2013). Impact of socioeconomic characteristics of farmers on access to agricultural credit. Sarhad *J. Agric. 29*(3).

Putri, A. K., Razia, E. T., & Muneeza, A. (2019). The potential of bai salam in islamic social finance to achieve United Nations' sustainable development goals. *International Journal of Management and Applied Research, 6*(3), 142-153.

Setiawan, R. A. (2022). Issues in Islamic Derivatives and Proposals for Reforms in the OTC Market in Indonesia. *Journal of Risk and Financial Management, 15*(5), 222.

Unal, F. G (2008) "Small Is Beautiful: Evidence of an Inverse Relationship between Farm Size and Yield in Turkey". Bard College at Simon's Rock, Working Paper No. 551

Usmani, MT (1998). *An Introduction to Islamic Finance,* Idaratul Ma'arif, Karachi, 216-218.

World Bank (2023). Agriculture and Food. Overview. https://www.worldbank.org/en/topic/agriculture/overview visited on September 3, 2023.

Younus, M. & Sabir, H.M. (1999). Economics of existing farming system in central Punjab, AARI. Faisalabad Pakistan.

Zang, D., Paudel, K. P., Liu, Y., Liu, D., & He, Y. (2023). Financial decision-making behaviors of Ethnic Tibetan Households based on mental accounting. *Financial Innovation, 9*(1), 93.

Zeller, M. & Sharma, M. (1997). Repayment performance in group-based credit programs in Bangladesh: An empirical analysis. *World development 25*(10), 1731-1742.