

A close-up photograph of rice stalks with golden-brown grains and green leaves, serving as the background for the report cover.

RICE REPORT

2021-22

LENDING IN AGRICULTURE

MAY 2022 | CERP | PRINCETON | HBL

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RICE REPORT 2021-22

Lending in Agriculture Project

May 2022

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EXECUTIVE SUMMARY

Large Scale Manufacturing (LSM) accounts for only around 9% of Pakistan's GDP.¹ Agriculture and allied services, such as Small and Medium Enterprises (SMEs), contribute around 59% to Pakistan's GDP.² The agriculture sector alone employs 38.5% of the country's workforce.³ However, Pakistan's banking sector disproportionately focuses on LSM. This approach is reflected in financial inclusion surveys, which highlight that 53% of the country's total population is financially excluded.⁴ Additionally, farmers continue to face a squeeze from multiple dimensions: predatory lending terms and restricted credit access, lack of quality farm inputs at listed prices, fragile supply chains and limited bargaining power, lack of advisory services, and increasingly climate change.

HBL launched an innovative lending project collaborating with a research team led by Professor Atif Mian of Princeton University to address these challenges holistically. As in previous crop cycles, farmers received advances for critical inputs and farm mechanization services at the start of the Kharif rice season in June/July 2021. The bank also contracted with bulk buyers to purchase the output from the farmers. The project's scope continued to grow at a healthy pace as HBL worked with 142 farmers across Okara and Gujranwala this season.⁵ The sample included many farmers who had worked with the bank during previous crop cycles, indicating their trust in and willingness to work with HBL.

The research team, led by Professor Mian, conducted extensive surveys of the farmers to evaluate the effectiveness of the project. The results from these surveys are summarized below. For comparison, we include regional averages for these statistics from the Directorate of Crop Reporting Service (CRS), Agriculture Department Punjab.

- **Yield**

Okara The average yield per acre was 42.2 (+77%) maunds per acre and 84.4 (+118%) maunds per acre for Basmati and non-Basmati varieties, respectively.

Gujranwala The average yield per acre was 32.1 (+35%) maunds per acre and 45.9 (+19%) maunds per acre for Basmati and non-Basmati varieties, respectively.

Regional The average yield per acre in the region was 23.8 maunds per acre and 38.7 maunds per acre for Basmati and non-Basmati varieties, respectively.

- **Pricing**

Okara Output sold via HBL received a price of PKR 1,870 per maund and PKR 1,310 per maund for Basmati and non-Basmati varieties, respectively.

Gujranwala Output sold through HBL-contracted buyers secured a price of PKR 2,030 and PKR 1,370 for Basmati and non-Basmati varieties, respectively.

Regional On the open market, Basmati sold for PKR 2,080 per maund and non-Basmati sold for PKR 1,400 per maund. We caution against taking these numbers at face value: HBL prices are net of deductions, while open market prices are gross prices before many

¹ [Pakistan Economic Survey 2020-21](#)

² [Pakistan Economic Survey 2020-21](#)

³ [Pakistan Economic Survey 2020-21](#)

⁴ [Financial Inclusion Survey, State Bank of Pakistan](#)

⁵ Our survey sample consisted of 140 farmers

(opaque) deductions are accounted for. We strongly believe that HBL secured better pricing for its clients, as it has in previous cycles.

61% of farmers sold some fraction of their crop on the open market. While the competition between buyers is healthy for the farmers' topline, open market selling may increase credit risk for HBL's portfolio.

- **Revenue**

Okara HBL farmers reported 63% and 116% higher revenues for their Basmati and non-Basmati varieties, respectively, relative to the average farmer in the region.

Gujranwala HBL farmers reported 31% and 16% higher revenues for their Basmati and non-Basmati crops, respectively, relative to the average farmer in the region.

- **Cost** Due to HBL's early procurement of inputs, clients received an 8.3% discount on their inputs on average relative to the market. Pre-season procurement of inputs has been HBL's strength in successive cycles now and a significant source of savings for clients.
- **Profitability** Given the superior input mix and marked increase in yield, particularly in the non-Basmati variety, HBL farmers' profit was five times higher than the average regional farmer. Importantly, non-Basmati rice was on average 1.1-2.4 times more profitable than Basmati rice for clients, indicating a potential arbitrage opportunity.
- **Client Satisfaction** On average, clients rated the project 8.5 (out of 10), indicating high satisfaction with service delivery. That many farmers continue to work with HBL in successive crop cycles is robust evidence that the bank has successfully delivered on its commitment to improving farmers' outcomes and welfare.
- **Digitization** Digital onboarding was welcomed by farmers and rated better than the paper-based onboarding process suggesting clients' openness to digitization.
- **Cross-Selling Opportunities** Almost a third of farmers expressed interest in other bank products, including personal and car loans.

If you have any questions or queries regarding the methodology, findings, or other details in this report, don't hesitate to contact me.



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1. PROFITABILITY

In this section, we compare the performance of HBL-contracted plots to regional averages on several critical dimensions. We combine data collected as part of baseline and endline surveys by the Princeton-CERP team and data gathered by the HBL team and focus on the following metrics:

- Yield per acre
- Prices and revenue per acre
- Cost and profit per acre

The basis of these reported figures are three primary sources: (i) Rice dispatch data of produce sold to HBL's bulk buyers; (ii) Input cost data from HBL's work orders; and (iii) Farmer-reported figures for yield, price, and cost as reported in the endline survey.

Our analysis uses a combination of HBL's internal data and farmer-reported data. We use HBL's internal data for cases where farmers sold their produce to HBL's bulk buyers and have bought inputs from the bank. We follow this approach since the bank collects more robust and verified data for targeted variables than farmer-reported data. However, we have used the farmer-reported figures in instances where farmers sold their produce to a third party and/or have procured their inputs independently due to the absence of data gathered and verified by the intermediary. This procedure ensures that we do not exclude important observations from our calculations.

To develop a regional benchmark against which we could compare the performance of HBL-contracted farmers, we have constructed estimates of farm performance for an average rice farmer in the Okara region. We do this for both Basmati and non-Basmati rice. Further, we sourced the yield, price, and cost estimates from the Directorate of Crop Reporting Service (CRS), Agriculture Department Punjab. Yield data is sourced from CRS' annual crop estimates for 2021-22.⁶ Cost per acre and price data points are taken from CRS "cost of production" estimates for 2021-22.⁷ Cost per acre data includes inputs required per acre, labor, and machinery required during sowing or harvesting, land preparation, irrigation, and transportation. By constructing robust regional benchmark figures, we can accurately compare the performance of HBL-contracted farmers to average rice farmers in the region. Lastly, to better understand the outcome of the project's intervention, we analyze data from both districts (Okara and Gujranwala) and both Basmati and non-Basmati rice separately.

1.1 YIELD

Okara The yield for HBL-contracted farmers for Basmati and non-Basmati was vastly better than the yield for an average farmer in the region. The Basmati and non-Basmati yields were 77% and 118% higher than their regional benchmarks respectively. As seen in Figure 1, HBL-contracted farmers reported an average yield of 42.2 maunds per acre for Basmati, compared to 23.8 maunds

⁶ [Rice annual crop estimates 2021-22](#)

⁷ [Basmati "cost of production" estimate 2021-22](#)
[Non-Basmati "cost of production" estimate 2021-22](#)

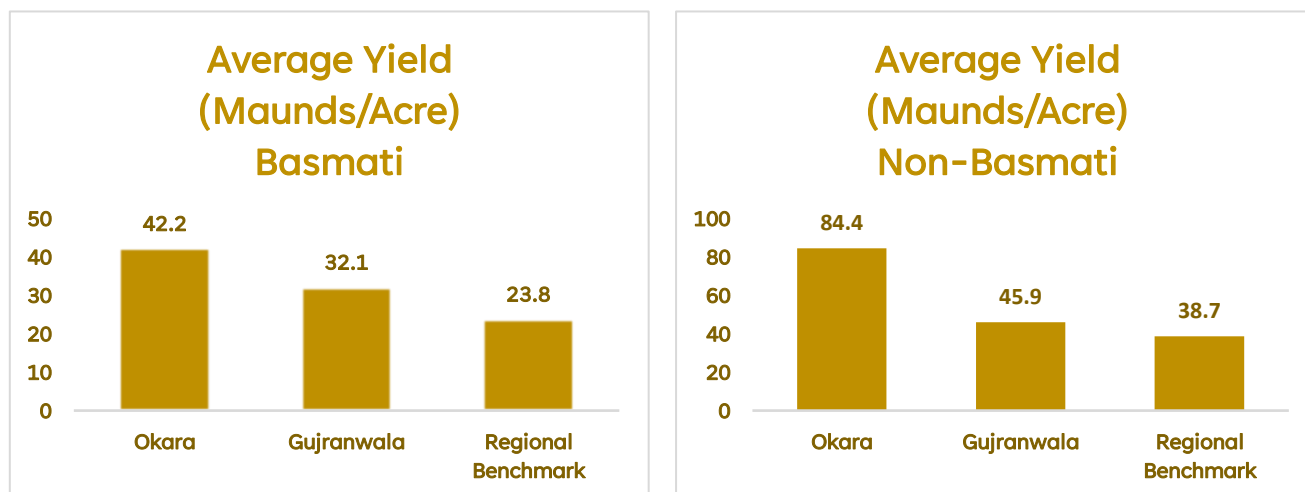


Figure 1 (a & b): Rice Yield

per acre for the regional average.[1] Moreover, HBL-contracted farmers reported 84.4 maunds per acre for non-Basmati variety, compared to 38.7 maunds per acre for the regional average.

Gujranwala HBL-contracted farmers performed considerably better than the regional benchmarks, reporting 35% higher yields for Basmati and 19% higher yields for non-Basmati varieties. As a result, HBL-contracted farmers reported an average yield of 32.1 maunds per acre for Basmati rice compared to 23.8 maunds per acre for the regional average. Moreover, HBL-contracted farmers reported 45.9 maunds per acre yield for non-Basmati variety compared to 38.7 maunds per acre to the regional average.

We can attribute this notable increase in the yield due to the high-quality inputs facilitated by the bank. Moreover, timely and effective advice by the bank's agronomists on the usage of inputs also resulted in an above-average outcome.

1.2 PRICES & REVENUE

Price The price offered to the HBL-contracted farmers in Okara and Gujranwala districts was higher after considering deductions, commissions, and other essential variables. The HBL-contracted farmers in Okara received a price of PKR 1,870 for Basmati rice compared to the regional benchmark of PKR 2,080. For non-Basmati rice, they received a price of PKR 1,310 compared to PKR 1,400 for the regional benchmark. Details can be seen in Figure 2. We observe a similar trend in Gujranwala, where HBL-contracted farmers received PKR 2,030 for Basmati rice compared to PKR 2,080 and PKR 1,370 for non-Basmati rice compared to PKR 1,400 for the regional benchmarks.

On initial viewing, it may seem that the prices offered to HBL-contracted farmers were lower on face value. However, the HBL price figure is net of any deductions (in the form of various fees and commissions) received by the bulk buyer. On the other hand, the regional benchmark is the gross price that does not account for the aforementioned deductions.

Revenue We saw an exceptional increase in revenue for HBL-contracted farmers for both the Basmati and non-Basmati rice, which can be attributed to higher yields for both rice types.

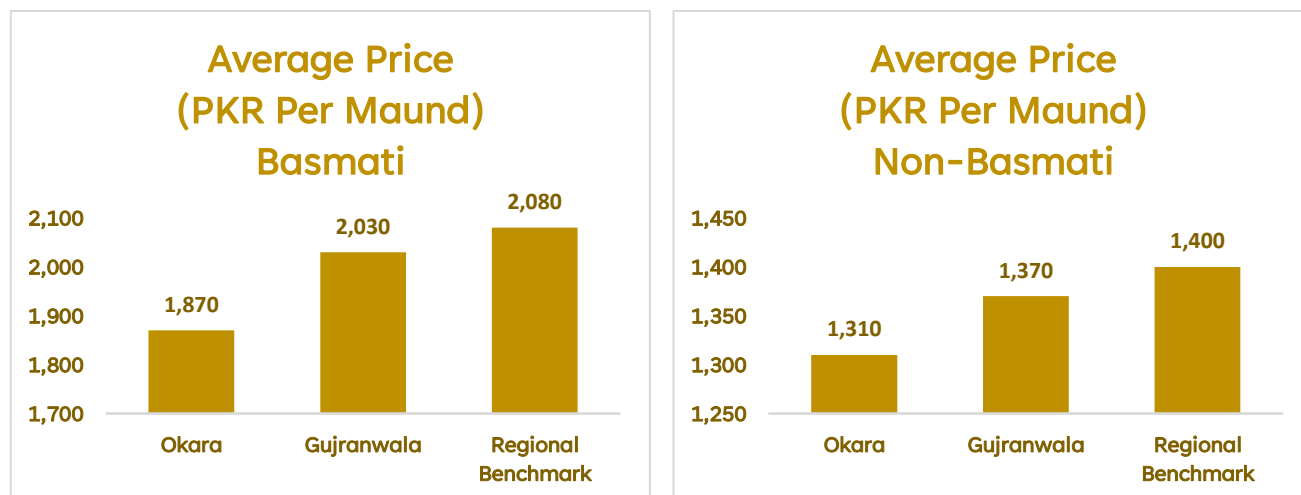


Figure 2 (a & b): Rice Price

Okara HBL-contracted farmers reported 63% higher revenues for Basmati and 116% higher revenues for non-Basmati compared to the regional benchmarks. The average revenue per acre for an HBL farmer was PKR 80,600 per acre, compared to PKR 49,500 per acre for the regional benchmark. In the case of non-Basmati rice, the revenue per acre for HBL-contracted farmers was PKR 117,000 per acre compared to PKR 54,200 per acre for the regional benchmark. Thus, on a rupee per acre basis, HBL-contracted farmers increased their revenue by PKR 31,200 per acre for Basmati and PKR 63,300 per acre for non-Basmati, as shown in Figure 3.

Gujranwala The HBL-contracted farmer's revenue was 31% higher for Basmati and 16% higher for non-Basmati relative to the regional benchmarks. As seen in Figure 3, the average revenue for HBL-contracted farmers for Basmati was PKR 65,000 compared to the regional benchmark of PKR 49,500. Moreover, HBL-contracted farmers had an average revenue of PKR 63,000 for non-Basmati rice compared to the regional benchmark of PKR 54,200.

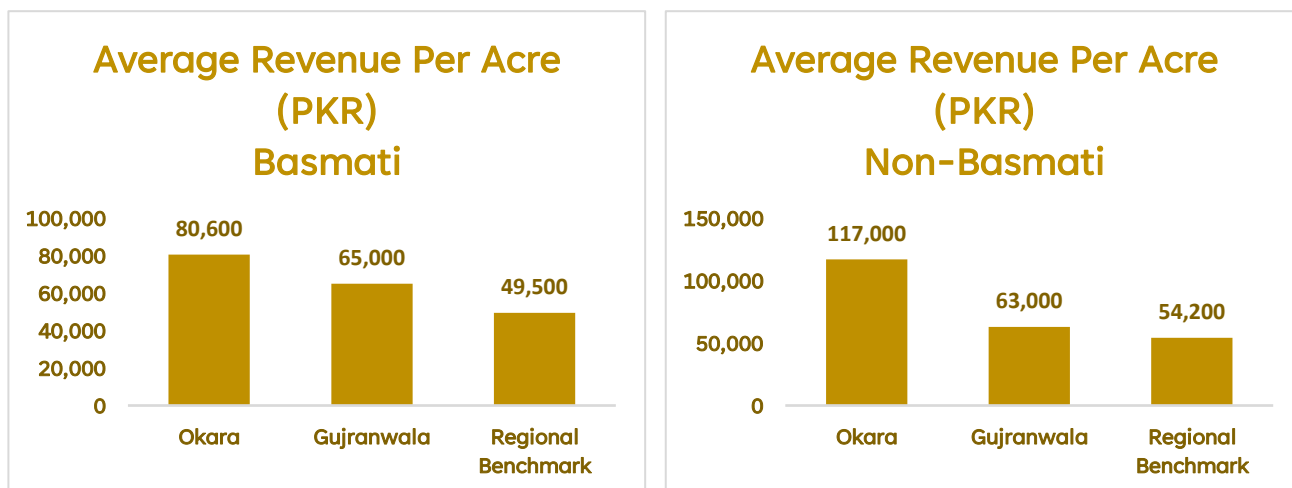


Figure 3 (a & b): Rice Revenue Per Acre

1.3 COST

HBL facilitated the procurement of inputs for contracted farmers at an 8.3% lower price, on average, compared to the market. In other words, if a farmer bought the same product through the market and through HBL's channels, they would receive, on average, an 8.3% lower price from the latter. The lower price was primarily due to HBL's pre-ordering of inputs prior to the crop cycle since agronomists had accurately estimated the expected quantity of inputs needed during the crop cycle.

Even though HBL's partner suppliers provided inputs at a price lower than the market's, the overall cost per acre for HBL-contracted farmers was still 3.7% higher, on average, for both regions than the benchmark. This is likely because HBL-contracted plots are more input-intensive, with farmers using larger inputs per acre than the regional benchmark. Another possible reason could be that HBL-contracted farmers used a higher quality of input products, which are naturally more expensive compared to lower quality products. Therefore, even though HBL's partner suppliers provided identical products at a lower price on average, the input cost per acre for HBL-contracted farmers would still be higher if they bought and used higher quality products, relative to an average farmer in the region. Even though higher quantity and quality of inputs incurred a higher cost for HBL-contracted farmers, it increased their yield and revenue by an even greater proportion, leading to a net benefit. Secondly, the higher cost per acre for HBL-contracted farmers could also be because other costs such as mechanization, transportation, and selling costs were higher than the regional benchmark. Our survey also corroborates this, as farmers expressed reservations about the higher cost of these services, details of which are presented in Section 2.

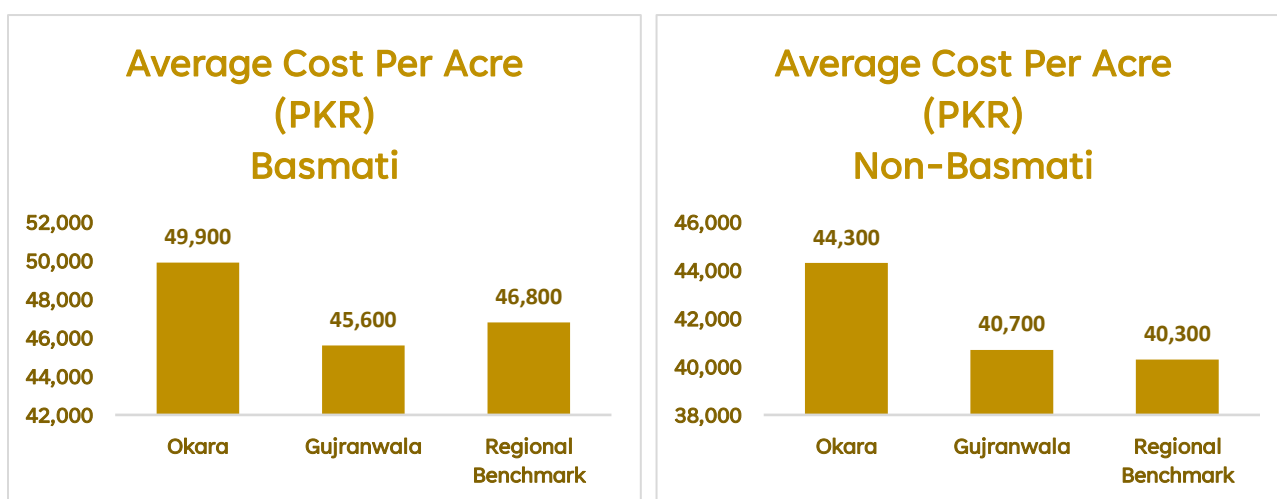


Figure 4 (a & b): Rice Cost Per Acre

Growing Basmati rice is costlier than growing non-Basmati rice, and we observe this difference in our internal calculations and the regional benchmarks as well. We relied on HBL's work orders and farmer-reported figures to calculate the cost per acre for each variety (Basmati and non-Basmati). We used farmer-reported data to incorporate any missing data from the work order or any additional cost that the farmer incurred during the crop cycle. As a result, our numbers for the cost incurred by HBL-contracted farmers for Basmati and non-Basmati rice are consistent with the regional benchmark numbers.

Okara The average cost incurred by an HBL-contracted farmer for Basmati rice was PKR 49,900 per acre compared to PKR 46,800 per acre for the regional benchmark, as displayed in Figure 4. In the case of non-Basmati, the HBL-contracted farmer incurred PKR 44,300 per acre compared to PKR 40,300 per acre for the regional benchmark.

Gujranwala HBL-contracted farmers incurred PKR 45,600 per acre on average for Basmati rice compared to PKR 46,800 per acre for the regional benchmark. For non-Basmati rice, total costs were PKR 40,700 per acre, on average, for an HBL-contracted farmer to grow this variety in comparison to PKR 40,300 per acre for an average farmer in the region.

DROP IN RICE YIELDS – FARMERS MOVING TOWARDS NON-BASMATI RICE?

CRS Punjab's projection for Basmati rice yield (2021-22) was 40.1 maunds per acre. However, the actual Basmati rice yield for the season was only 20.8 maunds per acre in Punjab; around half of the forecasted number. Similarly, for non-Basmati rice, the forecasted yield was 53.9 maunds per acre, while the actual yield was 27.4 maunds per acre in Punjab.

This large decline in yield, compared to expectations, is troubling and worth further investigation. A lower yield was one of the primary reasons why regional benchmark revenue per acre, and hence profit per acre, were extremely low this season, particularly for Basmati rice.

Lower profit opportunities for Basmati rice appear to be shaping farmers' decision-making as well. According to CRS Punjab's annual data, production of Basmati rice decreased by around 4 million tonnes in 2021-22 compared to 2020-21. Meanwhile, the production of non-Basmati rice has almost doubled in 2021-22 from 2020-21. Farmers seem to be moving away from Basmati rice and towards non-Basmati rice in terms of production.

Box 1: Drop in Rice Yields

1.4 PROFIT

On average, HBL-contracted farmers' profits were five-fold those of an average farmer in the region. We calculated profit by deducting the average cost per acre from the average revenue per acre. While the cost per acre for HBL-contracted farmers was marginally higher, the considerably higher yield led to much higher revenues and, hence, higher profits than an average farmer in the region. As referenced in Box 1, rice yield was much lower than the forecasted yield numbers throughout Punjab. As a result, the difference between regional benchmark yield and HBL-contracted yield was substantially large, leading to major revenue and profit differences. Complete calculations for profit per acre are shown in Tables 1 & 2.

Okara HBL-contracted farmers were able to earn a profit of PKR 30,600 for Basmati rice compared to PKR 2,710 per acre for regional benchmarks. For non-Basmati rice, HBL-contracted farmers earned a profit of PKR 73,500 per acre in comparison to PKR 13,800 per acre for an average farmer in the region, as displayed in Figure 5.

Gujranwala The average profit earned by HBL-contracted farmers in the case of Basmati rice was PKR 19,900 compared to PKR 2,710 per acre for regional benchmarks, as seen in Figure 5. For non-Basmati rice, HBL-contracted farmers earned a profit of PKR 22,700 per acre compared to PKR 13,800.

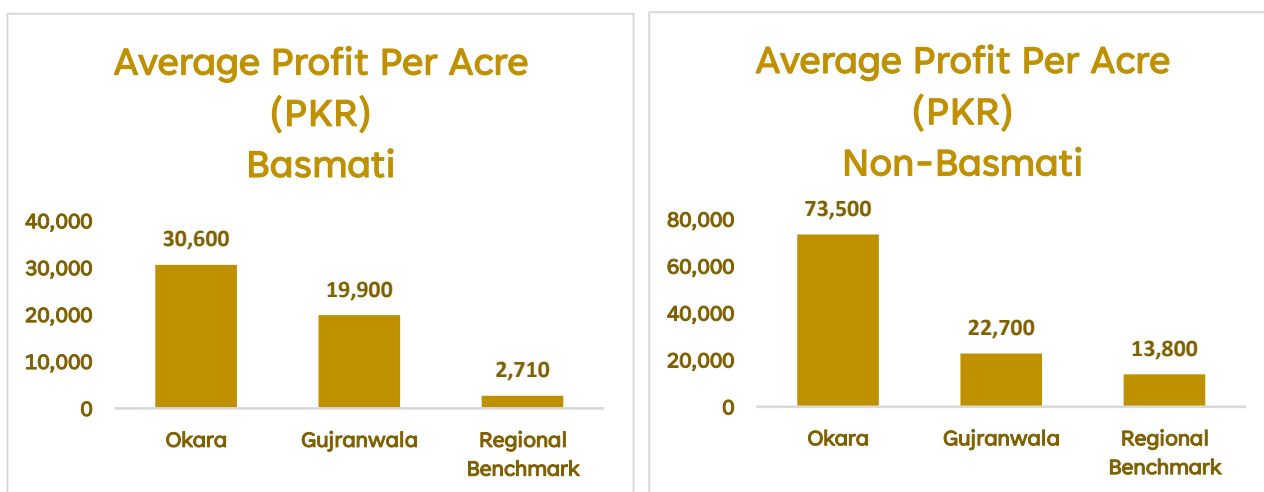


Figure 5 (a & b): Rice Profit Per Acre

Basmati Rice			
Variable	HBL - Okara	HBL - Gujranwala	Regional Benchmark
Yield (Maunds Per Acre)	42.2	32.1	23.8
Price (PKR Per Maund)	1,870	2,030	2,080
Revenue Per Acre (PKR)	80,600	65,000	49,500
Cost Per Acre (PKR)	49,900	45,600	46,800
Profit Per Acre (PKR)	30,600	19,900	2,710

Table 1: Rice Profit Table (Basmati)

Note: Financial metrics presented are averages across all farmers for which the relevant statistic is available. Thus, revenues, costs, and profits may not be arithmetically consistent.

Non-Basmati Rice			
Variable	HBL - Okara	HBL - Gujranwala	Regional Benchmark
Yield (Maunds Per Acre)	84.4	45.9	38.7
Price (PKR Per Maund)	1,310	1,370	1,400
Revenue Per Acre (PKR)	117,000	63,000	54,200
Cost Per Acre (PKR)	44,300	40,700	40,300
Profit Per Acre (PKR)	73,500	22,700	13,800

Table 2: Rice Profit Table (Non-Basmati)

Note: Financial metrics presented are averages across all farmers for which the relevant statistic is available. Thus, revenues, costs, and profits may not be arithmetically consistent.

2. FARMER FEEDBACK

As part of our endline survey, we collected farmer feedback on different aspects of the project to better understand their thoughts and evaluations, focusing on:

- Seeds
- Fertilizer and plant protection
- Machinery
- Experience and suggestions

HBL-contracted farmers gave an average rating of 8.5 out of ten to the project, signaling a high level of satisfaction with the services provided to them by the bank, as shown in Figure 6. Moreover, 32% of farmers gave the project a perfect rating of ten.



Figure 6: Project Satisfaction

Seeds A substantial fraction of farmers (92%) expressed their contentment with the information provided by the bank’s agronomists regarding seeds. However, even though most farmers found the provided seeds beneficial, 20% of farmers reported facing issues. Of those who faced issues, 50% complained about the high cost of the seed or of not getting the expected results. We previously explained how the bank had provided inputs at a lower price than the market, so this may seem contradictory to that. However, farmers’ feedback about the high cost of seeds makes sense if analyzed through the macroeconomic lens of Pakistan; farmers have had to face higher inflationary pressures and a steep PKR devaluation over the last few years. Since many of the HBL-provided inputs are imported, and the final good (i.e., rice crop) is priced in the domestic market, farmers have continued to face the brunt of our macroeconomic problems from both ends. Furthermore, other recurring issues mentioned about the seeds were their late delivery to the farmer, and negligible change experienced compared to seeds used in the previous crop cycle.

Fertilizer and plant protection As with seeds, most farmers (92%) appreciated the agronomists’ advice regarding fertilizers and plant protection inputs. Only a minority of farmers (8%) complained about not getting desired results from both the fertilizers and plant protection inputs. Like seed, the other criticism by the farmers was also about late delivery of inputs (20%) and limited change experienced from the inputs used by the farmer in the last crop cycle (20%).

Machinery Eighty-three percent of the farmers responded in the affirmative when asked whether the bank’s facilitated machinery was useful or not. Twenty percent of farmers reported facing an issue with machinery; 48% of them cited higher costs and dissatisfaction with the mechanization’s

results. 17% of them cited the late availability of machinery as problematic, along with the vendor's non-cooperative behavior.

Experience and suggestions: The farmer's response was largely positive when comparing this crop cycle's yield with the previous crop cycle, as shown in Figure 7. The majority of farmers (66%) said that their yield had increased considerably compared to the last crop cycle. Our analysis also supports this feedback. HBL-contracted farmers had yields far exceeding those of the average farmer in the region. It is important to analyze these findings in light of the farmers' feedback on seeds. As mentioned before, a portion of farmers stated that the current seed did not produce the



Exhibit 1 (a & b): Farmer Surveys

expected results. One possible reason is that some farmers expected even higher yields from the HBL-provided seeds. Furthermore, 6% of farmers said they did not experience any change in yield from the previous batch of rice, 28% of farmers also complained about getting a lower yield during this crop cycle.

Was the yield quality from this batch better, worse or equal to the yield of the last batch of rice?

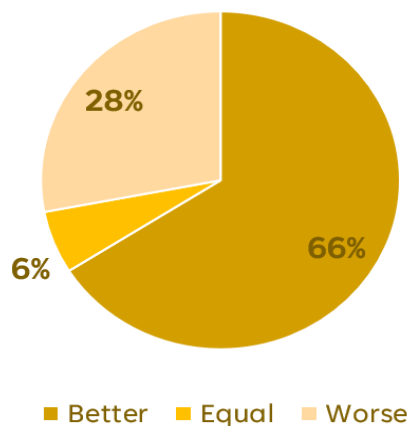


Figure 7: Yield Quality

Based on our survey, we found out that a large number of farmers (61%) had sold some part of their crop in the open market; we propose several ways to address this challenge. Out of these farmers, 51% cited higher rates offered in the open market than the rates offered by the bulk buyer as the reason for selling their crop in the open market. The other 44% stated that it was easier and more convenient to sell their produce in the open market than to sell it to the bulk buyer. The remaining 5% could not sell their crop to the bulk buyer since it did not buy the variety (PK-386) that these farmers had grown. This percentage breakdown is referenced in Figure 8. Based on the farmer feedback and response, we suggest that the post-harvest selling process be more streamlined. Additionally, greater awareness of the selling process needs to be created among farmers to remove any negative impressions associated with it. We also advise informing farmers that open market

Why didn't you sell your produce to the bulk buyer?

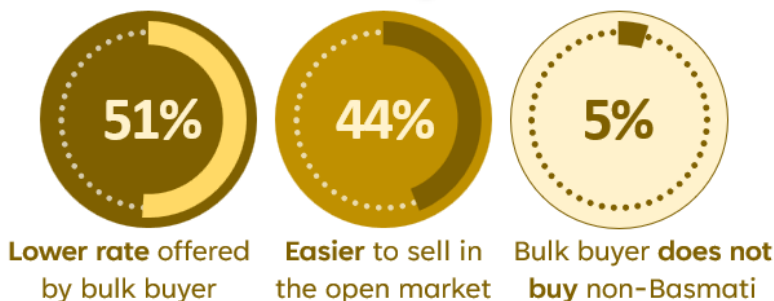


Figure 8: Bulk Buyer Selling

rates represent gross rates that include further deductions, while bulk buyer rates are net rates that do not include any such deductions. Therefore, bulk buyer rates can seem lower at face value even though they might not be in reality.

We also observed that an overwhelming majority of farmers (76%) claimed that their cost of selling (costs incurred from after harvesting till selling of crop, e.g., transportation to market, storage, packaging) had increased compared to the last batch of rice. While 9% of farmers also reported having experienced a lower cost of selling, the remaining 15% reported no change compared to the previous crop cycle. These numbers can be attributed to a high percentage of farmers selling their crop in the open market, which meant they had to bear the additional post-harvest cost of selling. As evidenced by the majority's answer, farmers felt macro-inflationary trends and overall price hikes in all aspects of life. It can be safely assumed that if farmers had sold their crop to the bulk buyer, they would have been able to avoid these additional costs, given that the bulk buyer would have been responsible for carrying out the post-harvest duties.

Did your revenue increase, decrease or remain unchanged compared to the previous crop cycle?

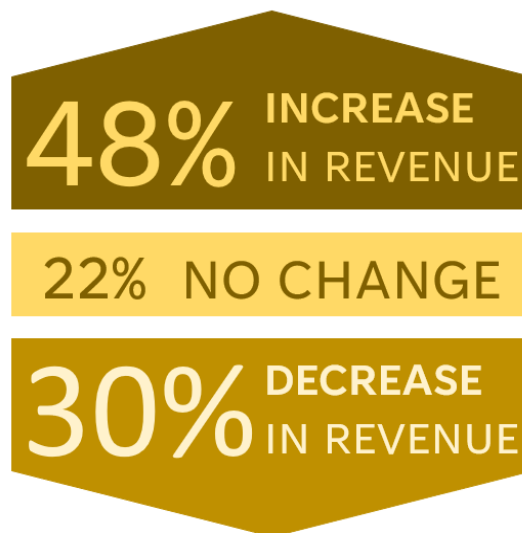


Figure 9: Change in Revenue

When asked to compare the revenue of this crop cycle with the previous one, 48% of the farmers reported an increase, as shown in Figure 9. However, 30% felt their revenue had decreased, while the remaining 22% claimed it was the same as before.

As far as financial markets are concerned, the project has improved financial inclusion, though usage of financial services remains a concern. Bank accounts were opened for 44% of farmers after their enrollment in the project. However, it was somewhat discouraging that 64% of these farmers never used their debit cards. We can expect this number to decrease once farmers understand its utility since farmers who had bank accounts prior to the project reported a lower percentage (45%) of never using their debit cards. Moreover, 34% of farmers shared that they were considering acquiring additional services from the bank. As shown in Figure 10, most of those farmers (69%) stated that they would apply for a personal loan (e.g., pay for weddings), 19% said they would apply for a car loan, while 12% cited various other reasons.

When asked about the onboarding process, we saw farmers' preference for the digital onboarding process since it consisted of less paperwork and consumed less of their time and effort. Moreover, farmers were asked to rate (from one to ten) the overall onboarding process for the rice crop; the average rating was 6.6 out of ten. The next question asked how farmers would rate the digital onboarding process, for which the average rating was 7.3 out of ten.

What type of new loans would you apply for?

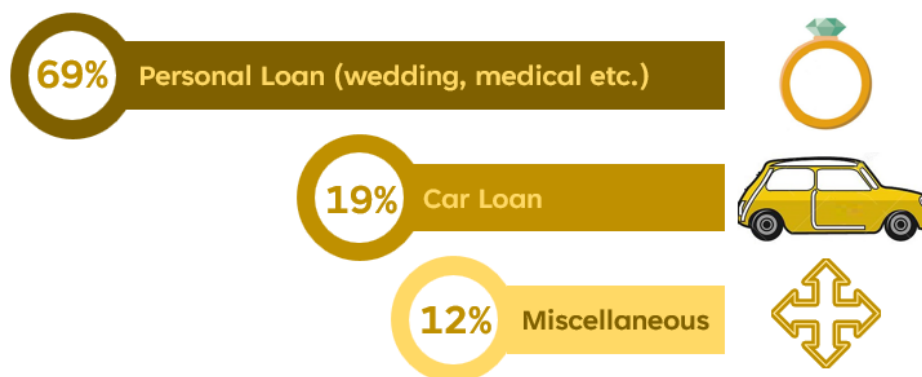


Figure 10: Loan Types

When asked for their suggestions for the project, a majority of farmers mentioned improving the delivery time of inputs. This aligns with farmers' opinions recorded in response to other questions asked in the survey. Late delivery of inputs meant that farmers had to buy the seeds themselves to prepare rice seedlings for timely transplantation. This delay makes farmers feel that the bank was not there to facilitate them at a critical juncture in the crop cycle. Furthermore, another recurring theme observed was farmer demand for low markup rates for financing than those currently offered by the bank. Lastly, farmers also suggested that bulk buyer prices be increased. As mentioned earlier, this highlights a lack of understanding regarding net rates offered by bulk buyers and the additional costs associated with the seemingly high gross rate offered in the open market. Farmers must be made aware of this technicality so their perception of bulk buyers changes. This will increase the amount of crop produce sold to the bulk buyer, improving data collection and record-keeping for the bank. More importantly, since the bank can directly reclaim its principal and interest from the bulk buyer, rather than waiting for the farmer to pay it after selling to the open market, increased bulk buyer selling will also ensure fewer cases of loan defaulters and late repayments.

RECOMMENDATIONS/CONCLUSION

The evidence presented in the report shows that HBL-contracted farmers performed substantially better than an average rice farmer in the region, driven by higher yields and the provision of higher quality inputs. In contrast to our findings from previous crop cycles, where HBL farmers' profit improvements vs. the regional benchmark were driven by lower costs, increases in the rice crop's profitability are largely due to the HBL farmers' superior yield. This result demonstrates that HBL can use multiple levers – be they cost reduction or yield improvement – to improve the income of its client farmers.

Despite these impressive results, there remains an information gap between HBL and its contracted farmers regarding the value of the lending product; addressing this friction should be an important priority for the bank. We report in Section 2 that 61% of farmers sold some part of their group in the open market. Most of these farmers cited higher open market prices as the reason that they sidestepped the bulk buyer. However, as we have noted across multiple reports, the price offered by the bulk buyer is net of any deductions whereas that offered in the market does not reflect these deductions. Given this discrepancy, it is essential that HBL launch an information campaign that educates farmers regarding why its offered prices are (at face value) lower than those in the open market. Once farmers are appropriately explained the reasons for the price differences, perhaps through visual aids or by citing a case study with real price and take-home revenue numbers, the rates of open market selling will likely decline. A reduction in this “non-compliant” behavior is also essential for the project's long-term sustainability, as open market selling increases the risk of late payments and delinquency.

While HBL has managed to improve financial inclusion in principle, the usage of financial products remains low in practice; HBL should address this shortcoming to fully reap the cross-selling benefits that this project can achieve. Around two-thirds of farmers who opened bank accounts as part of the project reported never having used their debit cards. This finding shows that cash reliance for contracted farmers (and in rural Pakistan more broadly) remains a deeply entrenched norm. Moving farmers towards using cash-alternative financial products should continue to be an HBL priority; digital outreach and onboarding can aid this effort. Farmers preferred a digital onboarding process relative to a paper-based one. This result shows that farmers are not averse to using novel technologies per se; rather, if farmers are made to understand the convenience of a product such as a debit card (perhaps as part of the information campaign described above), it might make them more conducive to using it as well as availing alternative lending products offered by HBL.

Non-Basmati rice was consistently more profitable than Basmati, both for HBL-contracted and comparison group farmers; these differences present an important arbitrage opportunity, which if harnessed may reduce credit risk for HBL. As mentioned in Section 1, non-Basmati rice was on average around 1.1-2.4 times more profitable than Basmati rice for client farmers. This significant gap suggests that either: 1) Basmati is in excess supply in the local market which pushes its prices down, or 2) Basmati exporters and/or domestic suppliers have more market power compared to farmers, which they use to keep local Basmati prices low. In either case, at the beginning of a crop cycle, HBL should consider evaluating which rice variety (Basmati or non-Basmati) is likely to be more profitable, and encourage farmers to sow the more lucrative variety, which is likely non-Basmati rice. The resulting improvements in farmer profits will likely increase farmer retention and reduce delinquency risk, both of which are critical objectives for the bank.

