Outcome Evaluation of BCI-GIZ Programme for Promoting Better Cotton Farming Practices in Maharashtra

Draft Final Report

AFC India Limited

Catalyzing Rural Prosperity

A Deemed Govt. Company
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Executive Summary

1. BCI-GIZ Programme Overview and Objective

The BCI-GIZ programme began in July 2019. It involves 140,000 farmers of Nandurbar, Chandrapur and Nagpur districts in the Indian state of Maharashtra. The implementation partners for the programme are Lupin Foundation (Nandurbar) and Ambuja Cement Foundation (Chandrapur and Nagpur).

The programme intended to improve the farming practices employed by Cotton farmers in Maharashtra. In particular, the programme targeted 5 key problems endemic to the cultivation practices of the area: (a) over-irrigation (b) excessive fertilizer application (c) resurgent pest infestations (d) overuse of broad-spectrum pesticides (e) adverse spill-over impact on the health of farm workers. The objectives of the programme in terms of verifiable outcomes were to:

a. Increase yield as a result of improved farming practices
b. Increase farmer income by improving yield and market connectivity
c. Improve environmental and decent work practices

In addition to training and informing farmers about better farming practices, the programme also focused on improving gender equity and reducing child labour.

2. Context and Objectives of Outcome Evaluation

The purpose of this third party evaluation is to assess whether all the programme activities were successfully implemented and to also measure the changes that can be attributed to the current GIZ funded BCI programme for promoting better cotton farming practices in Maharashtra. The evaluation is focussed on end line data collection, drawing comparisons between baseline and end line and compiling the findings in a formal report. The dimensions of the programme covered by this evaluation are:

- Farmer's income
- Cotton productivity
- Cotton cultivation practices
- Knowledge of environmental practices & decent work
- Gender equality
- Capacity building of farmers
- Continuous improvement plans of Producer Units
- Farmer meetings
- Local supply chain & market linkages in cotton
- Farmer data collection

The endline data collection exercise was based on the baseline study. Since the coverage of these dimensions in the baseline was deemed inadequate, additional questions were added to the survey. The final survey comprised of a set of quantitative questions on agronomics and six (6) qualitative questionnaires to gain a comprehensive understanding of the programme outcomes. The baseline survey suffered from data reliability problems and only 1293 respondents (out of the total 2005 respondents covered during the baseline survey) turned out to be the actual participants in the BCI-GIZ programme. Even among those who were a part of the programme, not all could be reached over the telephone.

The questionnaires were addressed to 743 farmers. Each farmer answered the quantitative questionnaire and at the most one (1) qualitative questionnaire. Not all of the 743 farmers could be reached (a second time) for the qualitative questions.

3. Summary of Quantitative Findings

Table 1.1: Status of Key Outcomes / Result Areas

Outcome / Result Areas / Outputs	Programme Endline	Programme Baseline / Validation	Counterfactual / Comparison
Focal Outcome / Result Areas			
Outcome Indicator 1: Pesticide Cost in INR/Hectare	4407	3079	5183
Outcome Indicator 2: Fertilizer Cost in INR/Hectare	6184	8437	9495
Outcome Indicator 3: Yield in Kgs/Hectare	1538	1302	1313
Outcome Indicator 4: Revenue in INR/Hectare	68570	63604	64016
Outcome Indicator 5: Profit in INR/Hectare*	37718 (36393)	28282	(28491)
INTERMEDIATE Outcome / Result Areas			
Intermediate Indicator 1: Pesticide use in Kgs/Hectare	1.89	2.92	2.13
Intermediate Indicator 2: Cost of Weeding in INR/Hectare	3849	6495	5460
Intermediate Indicator 3: Irrigation Cost in INR/Hectare	1870	1596	1543
Intermediate Indicator 4: Cost of Seeds in INR/Hectare	3458	3915	3003

Intermediate Indicator 5: Chemical Fertilizer use in Kgs/Hectare	353.06	NA	532.96
Intermediate Indicator 6: Chemical Fertilizer Cost in INR/Hectare	5316	NA	8639
Intermediate Indicator 7: Organic Fertilizer Cost in INR/Hectare	868	NA	856
Intermediate Indicator 8: Average Selling Price in INR/Quintal	4924	4895	4837
Intermediate Indicator 9: Cost of Storage and Transportation in INR	1652	2343	1916

* The cost of cultivation data available for baseline was not as fine-grained. 2 Different formulae were used to calculate. The profit information in () is more complete and should be used to compare profit of programme endline farmers with counterfactual farmers. Profit information not in brackets is less accurate, but uses the same cost information available for baseline data and can be used to check for year on year change in profit.

C.1. Statistical significance of differences

The figures presented in Table 1.1 show the values of a wide variety of measurable outcomes across 3 samples. These values can be used to calculate the difference across time (by comparing Programme Endline and Programme Baseline) and across a cross-section (by comparing Programme Endline with Counterfactual). However, due to sample size and the variation within these samples, not all of these differences are statistically significant.

The most important outcomes for which the year-on-year difference is statistically different from 0 are pesticide cost (increase by 43.1%), cost of weeding (decrease by 40.7%), cost of fertilizers (decrease by 26.7%) and profit (increase by 33.3%). The profit is, of course, the most important of these, but the cost of pesticide is perhaps more interesting as the increase is despite a 35.1% decrease in the use of pesticide, which was also statistically significant. This seeming paradox is likely a result of an increase in prices of pesticides (e.g. prices of confidor/super confidor rose by 41.9%) illustrating that many aspects of cultivation are beyond the control of an individual farmer.

The most important outcomes for which the difference between an 'in-programme' and 'counterfactual' farmers is statistically different from 0 are the cost of weeding (lower by 29.5%), chemical fertilizer use and cost (lower by 35.7% and 38.4% respectively), cost of seeds (higher by 15.1%), yield (higher by 17.1%), selling price (higher by 1.8%) and profit (higher by 27.7%).

4. Summary of Qualitative Findings

The qualitative aspect of the endline survey aimed to capture the adoption of practices promoted by the program. Some of these practices like attitudes about gender may not directly affect farm outcomes, while others more directly related to cultivation may show up in quantitative measures within 1 year of the initiation of the program.

Capacity building of farmers and Farmer Meetings: The average farmer (AV) surveyed was part of a learning group (LG) that had 26 members. The AV attended 3 LG meetings, 2 training sessions and got 5 personal visits from their field facilitator (FF). 83% of farmers who

were asked to assess the quality of training responded they at least found them somewhat useful (3 on a 5-point scale). Also, 89% were interested in adopting at least some of the changes (3 on a 5-point scale, included some changes, most changes, almost all changes), 77% stated they had the ability to adopt at least some of the changes and 74% claimed to have already adopted some of them.

Cotton cultivation and harvesting practices: New cultivation practices that were reported to have been adopted (3 on a 4-point scale including mostly and always) by the highest proportion of farmers were in the areas of weed management (90%), control of diseases/insects (87%) and balanced nutrition for crops (87%). Changing practices around irrigation found the least traction with 23% of the surveyed farmers responding that they never engage in appropriate irrigation scheduling. Though farmers did report a year on year increase in the number of their LG members who use weather forecasts to plan flexible irrigation schedules. In addition to changes in cultivation practices, between 95 and 98% reported that they always ensure that their cotton does not mix with bark/twigs, is not moist and is not packed in synthetic bags.

Knowledge of environmental practices & decent work: The largest year of year improvement shows up in planning around quantity and timing of fertilizer application with 77% farmers reporting that at least 20 members of their LG engaged in the practice in 2019-20 compared to 33% in 2018-19. However, despite the awareness of soil testing being high (88% report being aware of it) and its relation to fertilizer application, few farmers (around 24%) get their soil tested. There are also improvements in pesticide protection measures with more farmers segregating farm areas and getting training for applying pesticides compared to 2018-19. But despite the increased awareness of dangerous chemicals, monocrotophos continues to be used by 63% of farmers, though its usage has decreased year on year.

Child Labour: On average 0.79 children related to the farmer and 0.69 children who are temporary farm labour work on a farm. This is despite the high level of awareness about Indian laws on child labour (93% compared to 50% in the counterfactual), its adverse consequences for education (91%) and health (96%), and BCI principles. At least part of the reason for the continued prevalence of children unrelated to farmers working in farms would be the high levels of poverty in the region. Most of these children were involved in manual weeding and harvesting, with girls being represented in a higher proportion than boys. Though boys also work on farmyard manure application and irrigation related work.

Gender Equality: Women farmers on average get lower yields and lower profits. However, while their yield is about 200 kg/hectare less than the average for our entire sample, their profits are only about INR 60/hectare lower. They make up for the lower yield partly with the higher selling price that they get in the market (INR 4/quintal higher) and partly due to the lower cost of their cultivation practices. This is perhaps reflected in the temporary farm labour data where the average farm employs 11 women compared to 4 men. There are encouraging signs with 86% of farmers surveyed reporting that the number of women working on their farm has been increasing and only 11% saying that farming is difficult for women. But the perception that women are (and probably should be) paid less than men continues with farmers reporting lower

minimum wage for women than men (legally there is no difference), though the difference report by in-programme farmers is lower than that reported by counterfactual farmers.

Local supply chain & market linkages in cotton: 97% of the farmers surveyed reported that selling cotton was easier in 2019-20 compared to 2018-19. This is despite a majority of them selling to local traders (47%) or APMC traders (27%). Further, 97% think BCI affiliation helps in the sale of cotton and 43% claim BCI farmers get a higher price. The average reported price difference was INR 108 (the difference in average selling price between in-programme and counterfactual asked separately is about INR100). 25% farmer also reported that their loading, unloading, weighing charges had been waived.

5. Conclusions, Lessons Learnt and Recommendations

In-programme farmers in 2019-20 season had higher yields, revenues and profits compared to both non-programme farmers and programme farmers in 2018-19. They also faced lower costs and the overall trend in terms of verifiable outcomes is positive with the programme seeming to achieve its stated objectives. These successes also show up in the increased levels of adoption among programme farmers of improved farming methods and decent work practices. However, our results are based on a small non-random sample (largely due to the restriction imposed by the ongoing pandemic) and there are no statistical methods that we can use to identify the direction of the bias in our data relative to the entire population of in-programme farmers.

During this study, we also found that farmer's ability to record data is still very limited. 93% of them report relying on their FF to record data in their farmer field books. This may be partly driven by the low education attainment of farmers in the programme, but 86% of them also claimed to have received no training on data entry and this is an area that the programmewould do well to invest resources and time in developing training programs to help farmers in this area. This is particularly important in light of the push back we faced from many farmers on the amount of time they had to spend to give us the data we needed. In addition to the farmers, future evaluations of the programmewould benefit greatly from farmers getting more comfortable with data.

We also discovered that farmers see great value in Producer Companies. They believe they will help greatly with marketing along with also helping with almost every stage of cotton cultivation. This might be a dimension that the programme might do well to focus on. This is particularly important as given the remarkable improvements in the last year, it is likely that many of the quick and easy changes have already been adopted. The next stage of improvement will likely be slower and come at a higher marginal cost of effort and resources. This is particularly true of changes in gender equality, child labour and decent work that have a social component. These changes will require more sustained interaction with farmers.

1. Introduction

1.1 Background of the Programme

1.1.1 About BCI

The Better Cotton Initiative (BCI) — a global not-for-profit organisation — is the largest cotton sustainability programme in the world. In the 2018-19 cotton season, 2.3 million BCI Farmers received training on more sustainable farming practices and produced 5.6 million tonnes of Better Cotton – that equates to 22% of global cotton production.

BCI aims to transform cotton production worldwide by developing Better Cotton as a sustainable mainstream commodity. It seeks to train 5 million farmers worldwide on more sustainable agricultural practices, and account for 30% of global cotton production by 2020.

1.1.2 BCI-GIZ Programme in Maharashtra

The BCI-GIZ programme began in July 2019 and is expected to be completed by October 2020. The overall goal of the project is to ensure more sustainable and higher cotton yields leading to improved incomes for 140,000 farmers in for several districts of Maharashtra: Nagpur, Chandrapur, Dhule and Nandurbar. The BCI's implementation partners for this project are Ambuja Cement Foundation and Lupin Foundation.

The programme has a specific focus on:

● Increased yield as a result of improved farming practices
● Increased farmer income due to improved yield and market connectivity
● Improved environmental and decent work practices

1.2 BCI Theory of Change

BCI's mission is to make global cotton production better for the people who produce it, better for the environment it grows in, and better for the sector's future.

BCI's Theory of Change calls for transformation of the cotton production sector, catalysing movement toward sustainability in two spheres: Farm and Market, with changes amplified and sustained by supportive production and consumption policies.

Better for Farmers and the Environment: Farmers adopt more sustainable production systems, leading to farmers having free choice to grow Better Cotton because it is profitable. They can grow it in a way that promotes decent working conditions, enhances the environment, and brings benefit to their communities.

Better for the Sector's Future: Farmers have access to the market—and the market has proven that it values Better Cotton. It is a market that has embedded the costs of externalities into sourcing Better Cotton into its procurement strategies. The entire supply chain is engaged in sourcing Better Cotton. The supporting policy environment supports scale and long-term viability of improved sustainable cotton farming.

A more detailed schematic depicting BCI's Theory of Change is provided below.
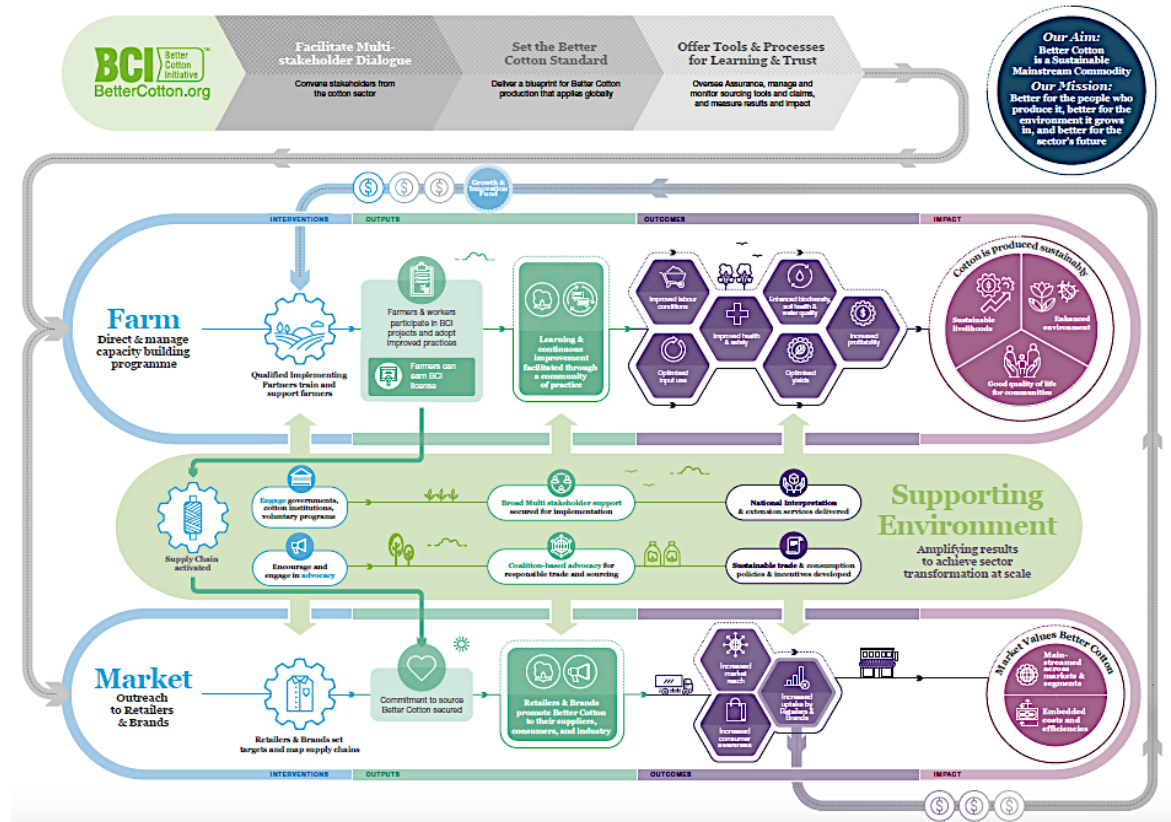
2. Scope and Methods of Evaluation

2.1 Context and Scope of the evaluation

The purpose of this third party outcome evaluation is to assess whether all the programme activities were successfully implemented and measure the changes that can be attributed to the current GIZ funded BCI programme promoting better cotton farming practices in Maharashtra. The evaluation is focussed on end line data collection, drawing comparisons between baseline and end line, and compiling the findings in a formal report. The dimensions of the programme that will be evaluated, as determined by GIZ indicators are:

- Farmer's Income
- Cotton Productivity
- Cotton cultivation practices
- Knowledge of environmental practices & decent work
- Gender equality
- Capacity building of farmers
- Continuous improvement plans of Producer Units
- Farmer meetings
- Local supply chain & market linkages in cotton
- Farmer data collection

Our *apriori* expectation was that one (1) year might be too small a time horizon to observe statistically significant differences in observed outcomes. Therefore the endline survey was designed to also evaluate the adoption of practices recommended to farmers, in addition to collecting information on economic variables pertaining to the various stages of cultivation. The quantitative and qualitative data so collected, were used to evaluate the efficacy of the programme.

The endline survey was carried out remotely with surveyors contacting farmers over the telephone and recording the data using ODK based CAPI (computer-assisted personal interview) tool kobotoolbox. The phone numbers of farmers were provided by the local implementation partners.

2.2 Study area and sample design

2.2 a. Study area and population: The study was limited to the three districts in Maharashtra (India) where the GIZ funded BCI programme was operational: Nandurbar, Chandrapur, and Nagpur. A total of 139,710 farmers were a part of the programme and formed the population that was to be evaluated. 50,666 of these had joined the BCI programme in 2019 and were part

of the programme almost a year at the time of the endline survey. The rest 89,044 farmers had been a part of the BCI programme for longer than 1 year.

2.2.b Sampling design, sample size and questionnaires: The initial sampling design for this study was a replica of the one purportedly used for the baseline survey carried out in July, 2019. The baseline sample had 2005 farmers, 1403 of whom had joined the programme in 2019 and 602 had joined earlier. However, we could not proceed with this approach of replicating the sample used in the baseline as the baseline data was deemed unreliable and it was found that only 1293 out of the 2005 farmers in the baseline sample were part of the BCI programme.

This smaller sample of 1293 was then randomly assigned to 6 stratified sub-samples, where each sub-sample had 216 farmers (167 farmers who had joined in 2019 and 49 farmers who had been in the programme for longer than 1 year). The segregation of the larger sample was necessitated by the problems of asking each farmer to answer all the qualitative questions. The qualitative questions were therefore organised into 6 separate questionnaires, with each of them to be addressed to the 216 farmers in every sub-sample. Each questionnaire focussed on collecting information on one specific aspect of the programme:

- Set 1 – Soil Health and Biodiversity related Agronomic Practices
- Set 2 – Environment-Friendly Practices
- Set 3 – Farmers' Capacity Building, Family Participation, and Cultivation Practices
- Set 4 – Employment Conditions and Social Aspects
- Set 5 – Better Cotton Harvesting and Value Chain Upgrading
- Set 6 – Better Cotton Value Chain Innovations and Data Management

In addition to qualitative questions, each of the 1293 farmers were to be asked a set of quantitative questions on the economics of cotton farming – input usage, costs, yield, revenue etc. There was a separate questionnaire for the control group of farmers who were not part of the programme. This questionnaire included all the quantitative questions asked of the farmers in the programmeand a few of the qualitative questions to assess the attitude of the non-programme farmers on issues like gender equality and child labour.

Endline In-Programme Sample: Out of the 1293 farmers who were called, we were able to get responses from 743 (661 from Nandurbar, 47 from Nagpur, and 35 from Chandrapur) on the quantitative questions. This despite the initial problems we faced in terms of incorrect phone numbers and the unwillingness on part of farmers to disclose information. These troubles were partially overcome by increasing cooperation with implementation partners in the data collections process by requesting them to - update farmer's phone numbers, communicate to farmers about the ongoing exercise and ask field facilitators to help with our efforts to reach the farmers. In this sample of 743 farmers, 632 joined the programme in 2019 and 111 joined earlier. Most of the farmers in our sample are small or marginal farmers, but it includes a few landless and large farmers.

Land Holding	Number	Proportion

Landless	6	1%
Marginal (<1 ha)	379	51%
Small (1-2 ha)	211	28%
Semi-Medium (2-4 ha)	98	13%
Medium (4-10 ha)	51	7%
Large (>10 ha)	4	1%

We were not able to reach all of the 1293 farmers that we called and consequently, there is a strong likelihood that our final sample suffers from a selection bias. Further, we were not able to get the responses from all 743 farmers on qualitative questionnaires. This was because of the approach (based on the feedback from our initial calls) to ask quantitative and qualitative in separate calls to ensure that we do engage farmers in very lengthy phone calls. The number of responses we were able to collect for the 6 sets are:

- Set 1 data - 59 farmers
- Set 2 data - 36 farmers
- Set 3 data - 47 farmers
- Set 4 data - 57 farmers
- Set 5 data - 60 farmers
- Set 6 data - 43 farmers

Counterfactual / Control group: We were able to reach 176 farmers (out of 526 farmers that we tried to reach) who were not part of the BCI programme. 65 of these farmers were from Nandurbar district, 42 from Nagpur while 70 were from the non-programme but nearby district on Dhule. The control group was provided by IPs and were defined as farmers who farm in the vicinity of farmers in the BCI programme, but are not a part of the programme. The pattern of landholding of farmers in this sample is similar to the in-programme sample, though a larger proportion are semi-medium farmers making up for the fewer marginal farmers.

Landholding	**Number**	**Proportion**
Landless	0	0%
Marginal (<1 ha)	55	31%
Small (1-2 ha)	49	28%
Semi-Medium (2-4 ha)	43	24%
Medium (4-10 ha)	25	14%
Large (>10 ha)	5	3%

2.3 Evaluation Design and Statistical Analysis

The design of the evaluation relies on two sets of comparisons. (1) Intertemporal comparison of in-programme farmers between baseline (2018-19 season) and endline (2019-20 season) (2) Cross-sectional comparison between in-programme and control group farmers (both for 2019-20 season). The two comparisons provide information on changes in important indicators

across time and to check if these changes are driven by farmer's participation in the BCI programme. As the samples that we have data for are a small proportion of the population, some observed differences across the two pairs may not be statistically significant. We identify the cases in which they are not significant and therefore not useful in drawing inferences about the population.

The evaluation design is limited in its ability to make or evaluate claims about the "causal" impact of the programme due to insufficient data. Firstly, we do not have data on the control group from the 2018-19 season and therefore cannot implement a pre-post design. Secondly, the non-random nature of our final sample will invalidate any causal claims even if derived from more sophisticated statistical methods. Thirdly and perhaps most importantly, as data from the baseline survey was deemed unreliable, we have relied on information collected in a validation study for information about 2018-19 season. This study only had 172 observations.

We had considered both a fixed-effects regression specification to identify the effect of the study over time and a matching estimator for comparison across the cross-section. But we could not reach all 172 farmers surveyed in the validation study during the endline implying that the fixed effects analysis would not be very useful. The matching estimator also would not be very illuminating given that neither our in-programme nor the control group sample was random. Therefore, we have limited ourselves to providing information on differences across the two pairs of comparisons and checking if the hypothesis that they (the sample averages) are drawn from the same population is accepted or not accepted. Consequently, the primary statistical analysis of data for any given indicator involves a two-sided *t*-test of two samples with unknown population variances at 5% level of significance. The null hypothesis for each of these test was $H_0: \overline{x_{ep}} = \overline{x_s}$, where x is the indicator of interest and $\overline{x_{ep}}$ is the sample mean for endline in-programme farmer $\overline{x_s}$ is the sample mean for either control group or the validation study sample.

2.4 List of Indicators

The quantitative indicators measured in the endline survey are presented in Table 2.1

Table 2.1: Indicators to be measured through End Line Telephonic Survey

Pesticides	
Use of Pesticides (along with brand of pesticide)	In Kgs per Hectare
Cost of Pesticides (along with brand of pesticide)	In INR per Hectare
Fertilizers	
Use of Fertilizers (along with type of fertilizer)	In Kgs per Hectare

Cost of Fertilizers (along with type of fertilizer)	In INR per Hectare
Water Usage	
Proxy – Cost of Diesel, Electricity and Water to irrigate	In INR per Hectare
Yield and Revenue	
Output of Seed and Lint Cotton	In Kgs per Hectare
Selling price	In INR per Quintal
Profit	
Cost of Land Preparation (cost of labour and machinery for tilling, ploughing and furrowing)	In INR per Hectare
Cost of Weeding (cost of labour + cost of weedicides)	In INR per Hectare
Cost of Harvesting (cost of labour and machinery)	In INR per Hectare
Cost of Storage and Transport	In INR per Kg
Cost of maintaining and using owned Machinery	In INR per year
Crop Insurance Premium	In INR per year
Interest paid on Loans	In INR per year

The most important indicator that determined many of the intermediated indicators for which data was collected was farmer's profit in the season of 2019-20. Profit was calculated as the Revenue from Sale of Cotton - Cost of Inputs in the cultivation of cotton, where the cost included cost of land preparation, weeding, seeds, pesticides, fertilizers, harvesting, storage, transport, maintaining owned machinery, crop insurance premium and interest paid on loans taken. The last three intermediate indicators were not a part of the baseline (validation study) and therefore the final profit will differ when calculated to be compared to baseline and when it will be compared to the control group.

The qualitative questions evaluate awareness of practices recommended by BCI and their adoption. In order to check if there have changes across time, some of the qualitative questions ask farmers to identify the number of the members in their learning group (LG) that they believe engaged in a particular practice in 2018-19 and in 2019-20. Some of the other questions that were not programme specific were also asked of control group farmers to check if there is any difference in the level of awareness across. The qualitative questions focussed on the following indicators:

- Evaluation of training methods – interest in, ability to adopt and adoption of suggested practices, efficacy of learning group and field facilitators, usefulness of different strategies used to disseminate information

- Specific agricultural Practices – Soil health management and other recommended cultivation and harvesting practices
- Environment friendly cultivation – bio-diversity management, water stewardship and use-management, soil testing
- Decent work and Gender equality– Use of harmful chemical, protection measures against harmful chemicals and child labour
- Benefits of being a BCI member – ability to access the market, selling price differences, waiving off of loading and weighing fees
- Data Management – how farmers record data, perceived usefulness of recording data

2.5 Data Collection

A phone-based data collection method was used for the endline survey. The phone surveys lasted between 35 and 45 minutes for quantitative questionnaires and ranged from 20-30 mins for qualitative questionnaires. We discovered during the course of the data collection that the farmers were busy with harvesting in the early part of the study and, with harvesting and festivities in the later part. This probably explains some of their reluctance in the engaging in long conversations. However, we also got multiple reports of farmers complaining about the frequency of research studies for which they are expected to provide information.

3. Results and Findings

The aims of the BCI programme were to increase farmer's yield of cotton and income from cotton cultivation by improving farming practices, along with improving compliance with decent work and environment friendly practices. At the beginning of the study, our expectation was that interventions that require farmers to change their behaviour take time to manifest as verifiable changes. However, we found remarkable changes in different parts of the cultivation process that show up as difference across time (2018-19 to 2019-20) and difference between in-programme and control group farmers. We also found that we can at least map at least some of the change we observe in the quantitative data onto the increased adoption of practices captured in qualitative information.

3.1 Analysis of Quantitative Outcome Indicators

Component 1: Pesticide Usage

The BCI programme intended to reduce overuse of broad-spectrum pesticides while also helping farmers control resurgent pest infestations. We measure the change in use of pesticides to report their pesticides usage by naming all the brands of pesticides they have used, area they have used them on and the cost of these pesticides.

	Endline In-programme	Control Group	Validation Study
Average Pesticide Use (Kgs/Ha)	1.89	2.13	2.92
Average Pesticide Cost (INR/Ha)	4407	5183	3079

We find that the pesticide usage is lower in the endline in-programme (EiP) sample. But only the difference with respect to Validation study is statistically significant. It is also large in value at 35.1%. However, paradoxically the cost of pesticide is 43.1% higher in the EiP sample compared to validation study. This is explained by the increase in price of pesticides, where the price of popular pesticides like confidor and super-confidor rose by 41.9%.

Component 2: Fertilizer Usage

Reducing excessive fertilizer usage was another important aspect of improving farming practices in the BCI programme. The data was collected following the same pattern as that for pesticides. Fertilizer prices are actively subsidized in India and therefore do not suffer the prices vagaries that pesticides do. Therefore a comparison of cost of fertilizers is sufficient to capture

information about fertilizer usage. This is particularly important, the validation study does not distinguish between chemical and organic fertilizers as clearly as the endline survey.

	Endline In-programme	Control Group	Baseline Validation
Average Fertilizer Cost (INR/Ha)	6184	9495	8437
Average Chemical Fertilizer Use (Kgs/Ha)	353	533	NA
Average Chemical Fertilizer Cost (INR/Ha)	5316	8639	NA
Average Organic Fertilizer Cost (INR/Ha)	868	856	NA

The cost of fertilizer is the lowest in the EiP sample and the differences are statistically significant (26.7% lower than validation study and 34.8% lower than the control group). It seems that not all of the benefits of the programme have accrued in 2019-20 season as the in-programme farmers had lower cost than control group in the previous season. The average chemical fertilizer use and cost is lower (and statistically significant) in the EiP sample than in the control group, whereas the cost of organic fertilizer and its usage does not vary significantly.

Component 3: Water Usage

Over-irrigation is another common problem among farmers that BCI programme aimed at reducing. Getting accurate information from farmers about the amount of water they have used over a phone is a very difficult task. Therefore, in order to avoid getting inaccurate data, we instead asked farmers about the cost they have incurred on buying diesel, electricity and/or water to irrigate their fields.

	Endline In-programme	Control Group	Baseline Validation
Average Irrigation Cost (in INR/Ha)	1870	1543	1596

Despite the cost of irrigation in EiP sample seeming to be quite high compared to the other two, the differences are not statistically significant.

Component 4: Yield

One of the primary objectives of the programme was to increase the cotton yield for farmers in the program. In the endline survey farmers were asked to report the number of quintals of seed and lint cotton they produced in the 2019-20 season.

	Endline In-programme	Control Group	Baseline Validation
Average Cotton Yield (in Kgs/Ha)	1538	1313	1302

Yield of the EiP is the highest of the three and it is statistically different (17.1% higher) from the control group. There were some reports of some areas being affected by the pink bollworm in the 2019-20 and this is perhaps a reasonable post-hoc explanation for the lack statistically significant year on year growth. But our results do show that the EiP farmers were likely less affected by the infestation than the control group farmers.

Component 5: Revenue

An increase in yield benefits the farmer if it translates into revenue. We calculated the revenue of each farmer by asking them to report the price at which they were able to sell their produce in the market.

	Endline In-programme	Control Group	Baseline Validation
Average Selling Price (in INR/Quintal)	4924	4895	4837
Average Revenue (in INR/Ha)	68570	63604	64016

The average selling price and revenue is the highest in the EiP sample, but in the both the outcome the year-on-year changes are not statistically significant. However, the difference with respect to the control group is significant and is 1.8% higher for average selling price and 7.1% for average revenue.

Component 6: Profit

Profit is the single most important indicator in terms of the benefits that accrue to farmers from being part of the BCI programme. We do not ask farmers to report their profits, instead we collect information on the cost incurred for almost every part of cultivation process. This means that we end up collecting a lot of information on intermediate indicators.

	Endline In-programme	Control Group	Baseline Validation
Average Cost of Land Preparation (in INR/Ha)	2981	3167	3987
Average Cost of Land Preparation + Cost of Owned Machinery (in INR/Ha)	5091	6856	NA
Cost of Seeds (in INR/Ha)	3458	3003	3915
Cost of Weeding (in INR/Ha)	3849	5460	6495
Cost of Harvesting (in INR/Ha)	6494	6027	9511
Cost of Storage and Transportation (in INR/Ha)	1652	1916	2343

Average Profit with all costs (in INR/Ha)	36393	28491	NA
Average Profit with some costs missing (in INR/Ha)	37718	NA	28282

The cost of land preparation and almost every other cost is lower in the EiP sample, except for the cost of seeds. Though the statistically significant difference in the cost of seeds in EiP and control group is hard to explain given the data we have, but we know that more EiP farmer use hybrid seeds and fewer of them use BT seeds. The other statistically significant and large differences are in the cost of weeding (in EiP 29.5% lower than control group and 40.7% lower than validation study sample) and the difference in the cost of harvesting with respect to validation study. Profit has two separate figures as profit is calculated without the cost of owned machinery, cost of crop insurance and interest payments on loans to ensure that it can be compared to profit data from the validation study showing a 33.3% year on year increase. The profit calculations to compare EiP and control group is more comprehensive and here the profit is 27.7% higher than the control group.

3.2 Analysis of Qualitative Outcome Indicators

The qualitative outcomes focus more on the reported adoption of suggested practices. Therefore, the results on these outcomes are reported as proportion of surveyed farmers which should be understood as a measure of the level of awareness.

Component 1: Evaluation of Training Methods

The average surveyed farmer is part of a Learning Group (LG) that has 26 members, and in the 2019-20 season attended 3 meetings, 2 training session and received 5 home visits by field facilitators. 83% of farmers who were asked to assess the quality of training responded they at least found them somewhat useful (3 on a 5-point scale). Also, the surveyed farmers reported high levels of interest and ability to adopt the changes being recommended by BCI.

Assessment of Training	% reporting atleast some, many/most, almost all
Interest in adopting changes	89%
Ability to adopt changes	77%
Changes actually adopted	74%

BCI has also been trying out innovative methods to disseminate information and when asked to evaluate these methods farmers showed a strong preference for videos but seemed to suggest that street plays may not be very effective.

Assessment of Awareness Drives	Videos	Songs	Street Plays	Loudspeaker Message
Very useful	43%	17%	11%	32%
Could be much better	23%	13%	9%	23%
Do not remember	11%	28%	21%	21%

Have not seen / heard	23%	43%	60%	23%

Component 2: Specific Agricultural Practices

The BCI programme reported to hold multiple training sessions on cultivation practice. We identified few of issues that these training sessions were focused check if these trainings translated into practice. The most striking results were on weed management and balanced nutrition for the crop which seems to reflect some of the cost savings on weeding and fertilizer use observed in quantitative data.

Cultivation Practices	Never / Rarely	Sometimes	Mostly	Always
Variety of cotton for climate and date	2%	30%	43%	26%
Planting date for conditions	11%	28%	32%	30%
Row spacing based on variety & conditions	9%	26%	26%	40%
Balanced nutrition for the crop	0%	13%	47%	40%
Appropriate irrigation scheduling	23%	11%	19%	47%
Control of disease/insect	0%	13%	36%	51%
Weed management	0%	11%	43%	47%

In addition to cultivation practices, the BCI programme also emphasized harvesting practices that help improve the price that farmers can get in the market. Most farmers seem to be following these harvesting related practices.

Harvesting Practices	Cotton does not get mixed with dirt/twigs	Cotton does not get moist	Cotton not packed in synthetic bags
Never	0%	0%	2%
Sometimes	2%	2%	3%
Always	98%	98%	95%

Component 3: Environment-Friendly Cultivation

Encouraging farmers to engage in more environment friendly practices has been an important focus of the training sessions in the BCI programme. We identified practices related to soil and water management to check the rate of adoption of these practices. In the questions on soil health management practices, we asked the farmers to compare the number of members in their LG who adopted the practices in 2018-19 and in 2019-20. This allows us to get some sense of how things are changing over time. The most remarkable improvement is the area of planning the quantity and timing of fertilizer application, which again maps on the tremendous cost savings that EiP farmers make on fertilizer cost.

Soil Health Management	2019-20 (High >30 + Moderately High 20-30 Members in LG)	2018-19 (High >30 + Moderately High 20-30 Members in LG)
Use of soil test reports for nutrients	35%	27%
Use of lime/gypsum to correct soil pH	17%	15%
Not burning cotton plant residues	28%	35%
Improving soil organic matter	27%	22%
Quantity and timing of fertilizer application	78%	33%
Minimum tillage system	27%	22%

But not all the data points are as easy to interpret. For instance, 88% of the farmers said that they were aware of soil testing and 60% of them reported that it is particularly useful in planning fertilizer use. But, in the quantitative section only 24% farmers said that they had conducted soil testing (not related to BCI soil testing criteria). It seems like this is partly due to the delays in getting results of soil testing.

Water Stewardship Measures	2019-20 (High >30 + Moderately High 20-30 Members in LG)	2018-19 (High >30 + Moderately High 20-30 Members in LG)
Weather forecasts and irrigation	31%	14%
Flexible Irrigation schedule	50%	42%
Recording data in Farmer Field Book	8%	8%
Using data to improve efficiency	17%	14%
Monitoring & maintaining water storage structures	36%	33%
Recording water quantity & quality issues	19%	14%

Water stewardship measures are particularly important as we did not find any statistically significant change in the cost of irrigation from the quantitative question. The results of the qualitative questions also show this to the extent that the adoption of stewardship measures have not increase substantially year on year. Though, there does seem to a large increase in the awareness of using weather forecasts to plan irrigation schedule. Further, in terms of water use management spreading compost is most favored method used by 53% of the surveyed farmers.

Water Use Management	% of Respondents

Mulching	6%
Spreading Compost	53%
Alternate Furrow	39%
Drip/Sprinkler	28%

Component 3: Decent Work and Gender Equality

The BCI programme also aimed at reducing the adverse spillover effects of farming practices on the health of harm workers. We assessed the increase in adoption of better practices in this regard by asking farmers about the measures they take to protect themselves from the harmful effects of chemicals used in the cultivation process.

Protection Measures	2019-20 (High >30 + Moderately High 20-30 Members in LG)	2018-19 (High >30 + Moderately High 20-30 Members in LG)
Segregating Farm Areas	28%	14%
Regular monitoring of crops	22%	22%
Increasing beneficial insects	6%	3%
Use of border crops	33%	19%
Training to use pesticides	42%	31%
Not reusing pesticide containers	11%	6%

We found the adoption of protective practices to be low, even though there has been some year-on-year improvement in the farmer segregating farm areas and increasing the use of border crops. This lack of perceived importance of decent work practices also shows in the relatively low usage of protective equipment with 67% of farmers using some protective equipment when spraying pesticides but only 36% using PPE kits. The lack of safety measures is of particular concern due to the continued usage of banned chemicals like Imidacloprid which is still used by 63.8% of farmers (down from 66% in 2018-19).

Average usage (no. of times per farm)	Imidacloprid (Imida)
2019-20	1.81
2018-19	1.78

The difficulty of changing attitudes on decent work also shows up in the data on farm workers. Though small in small numbers, children continue to work in farms both as part of family labour and as temporary farm labour. Our surveyors reported that children, particularly girls are mostly involved in manual weeding and harvesting. Boys are also involved in farmyard manure application and irrigation (particularly supervising flood irrigation).

Average Numbers per Farm in 2019-20 Season	Men	Women	Children
Number of family members engaged as labour on your cotton farm(s)	1.94	1.19	0.79
Number of permanent farm labourers	0.06	0.02	0.00
Number of temporary farm labourers	4.09	11.06	0.62

What is surprising is that the practice continues despite higher levels of awareness of government laws against child labour in the EiP sample (93%) compared to the control group (50%). The farmers also seem to be cognizant of the ill-effects of working on children and of BCI's principles on the issue.

Attitudes and Awareness about Child Labour	EiP
Child Labour affects Education	91%
Child Labour affects Health	96%
Children should not expose to high temp, noise or vibrations	95%
Children should not lift or transport heavy loads	89%
Children should not be exposed to dangerous machinery	91%
Children should not be exposed to dangerous chemicals	96%

We conclude that awareness is a necessary but insufficient for eliminating child labour, and it is very likely that incomes in the area will need to increase further before progress can be made in this area. On the other hand, awareness of gender equality seems to have translated better into actions. The farm labour data shows that about 11 women work on the average farm compared to 4 men. We wanted to check if these women workers are treated fairly and checked the perceptions of farmers about minimum wages laws (and practice).

Minimum wage	Control Group	EiP
Awareness about Minimum Wage	33.90%	71.93%
Average Current Minimum Wage (in INR/day)	148	167
Average Current Minimum Wage for Women (in INR/day)	128	152

We found that compared to the control group, EiP farmers were more aware of minimum wage laws. This increased awareness also showed up when we checked if farmers thought there was a difference between minimum wages for men and women (there is no difference between the two in Indian law). Both groups of farmers thought that minimum wage for women was lower, but the difference was lower in the case of EiP farmers. In addition to their perception of wages, we also asked them questions to check if they are aware of the problems that women face in working on farms.

Challenges facing female farmers/far workers	Control Group	EiP
Women are paid less than males	56%	63%
Tougher to get wage increase for women	47%	56%
Views of women are usually overlooked	61%	56%

Women perform unwanted, tiring tasks like picking and weeding	79%	46%

Compared to control group, EiP farmers display a better understanding of wage related issues that women workers face. They are less likely to think that women's views are ignored or that they perform more tiring tasks. This is perhaps as 86% of the EiP farmers think that increased sensitivity towards women problems is helping them participate more in farming. In fact, 86% of them (compared to 63% in control group) said that the number of female workers has been increasing on their farms and only 11% (27% in control group) of them thought that it is difficult for women to participate in agriculture.

Women Farmers	EiP Sample	Women in EiP
Average Yield (in Kgs/Ha)	1538	1359
Average Profit (in INR/Ha)	36393	36329
Average Selling Price (in INR/Quintal)	4924	4928

We also checked if an echo of these encouraging results shows up in our quantitative data that had information on 27 women farmers. Women farmers have a lower average yield than the average of the EiP sample, but the difference is yield is much larger (181 Kgs/Ha) than the difference in profits (INR 64/Ha). They make up for the lower yield to a small degree by getting higher prices (INR 4/Quintal extra) for their cotton. The rest they make up for by being more frugal in their cultivation practices.

Component 4: Benefits of being a BCI member
The BCI programme also intended to improve farmers' market connectivity. We asked farmers who they sold their produce to in 2019-20 season and found that most them sell to the local trader. While our questionnaire did not specifically ask farmer about BCI ginners, but we did find that a quarter of them sold their cotton directly to ginners.

Sale to	% of Respondents
Local Trader	47%
Trader in APMC	27%
Ginner	23%
Industrial Buyer	3%

97% of farmers also reported that it was easier to sell their produce in 2019-20 compared to 2018-19. A similar proportion of farmers responded that BCI affiliation helps with sale of cotton and on average gets them an additional INR 108/quintal on the market. This number is in line with INR 87/quintal difference (relative to control group) we found in our quantitative questions. This is difference is perhaps explained by the high adoption of better harvesting practices reported by EiP farmers in separating cotton from twigs and dirt, ensuring that it is not moist and not packing it in synthetic bags. 25% of farmer also reported that their loading, unloading, weighing charges had been waived on account of being BCI farmers. It seems that while some progress has been made in terms of connecting farmers with market, a lot more can

be done to improve the prices they get on the market. A fact that shows in the enthusiasm shown by farmers for producer companies. A very large proportion of the farmers think that producer companies will help them in every stage of the cultivation process, including in accessing markets for their final output.

Feedback on Producer Companies	Disagree	Partially Disagree	Agree
PC can help improve access to better quality agri-inputs	5%	3%	92%
PC can help access better crop and weather advisory	8%	2%	88%
PC can help access agricultural machinery	7%	0%	93%
PC can help reduce dependence on middlemen	3%	0%	97%
PC can help aggregate, store and transport	18%	2%	80%
PC can help set up ginning units	18%	2%	80%

Component 5: Data Management

Being able to record farming related data and use it forms a key part of building farmers' capacity to improve practices. As all BCI farmers are required to maintain a field book, we inquired with farmers to check if they are able to meet this requirement.

Do you fill your farmer field book	% of Respondents
Yes	19%
No	77%
Mostly	5%

We found that most farmers do not fill their field books. But that was not the most surprising part of our findings. When asked how often they updated their field books, an overwhelming 93% of them responded that they do not fill their books. This number is much higher than 77% that reported not filling in their field books.

Who records field book data	% of Respondents
Don't know	44%
Field facilitator records the data	35%
I record all the data myself	16%
I record with help from the FF (Field Facilitator)	5%

In response to another question that asked farmers to report who fills in their field books, 35% of them reported than their field facilitator (FF) fills their books and another 5% fill their book with the help of the FF. A high proportion, 44% reported that they do not know who records data in their field books. The inconsistent responses with regards to question on data management also show up in another question asked to check if farmers think there is any benefit of recording data.

Benefits of recording data	% of Respondents
I do not record data	51%
It is somewhat useful	14%
It is highly useful	35%
It has improved my cotton farming in a major way	0%

51% report that they do not record data, though 49% seem to think that it is at least somewhat useful. Some of the conflicting responses are perhaps due to lack of training. 86% of the farmers reported that they have not received any training on recording data. The low educational attainment of the average farmer means that it would be difficult to train farmers, but this is an aspect of the programme that needs significant improvement.

3.3 Conclusions, Lessons Learnt and Recommendations

One of the objectives of the GIZ funded BCI programme was to increase farmers' income by increasing yields, improving farming practices and increasing market connectivity. In terms of measurable final outcomes, we find that the programme has met most of its objectives. Farmers in our EiP sample had higher yields, income and profits compared to 2018-19 and our control group. Some of the differences were not statistically significant, for instance the year-on-year change in yield, but even so the trend seems to point to improvements. In particular, we observe that EiP farmers face lower cost of cultivation – weeding, fertilizers, harvesting, storage and transportation. The underlying reasons for some of these changes show up in qualitative data on adoption of cultivation and harvesting practices. In fact, the across time and cross-section that we observe are truly remarkable and belie our *apriori* expectation that 1 year may not be sufficient time to observe measurable difference in outcome. However, we must caution that our comparisons are based on a small non-random sample (largely due to the restriction imposed by the ongoing pandemic) and that there are no statistical methods that we can use to identify the direction of the bias in our data relative to the entire population of in-programme farmers.

The other objective of the programme was to inculcate decent work and environment friendly practices among farmers. In this regards it has not done as well as it has on improvements in final outcomes. The adoption of many of the suggested changes is still relatively low, though we do find some year-on-year improvement and EiP farmers are on average better informed than our control group. An important caveat to our findings in this regard is the discrepancy between self-reported data and data from farmers reporting on other members in their LG. Self-reported adoption is consistently higher than the adoption rates that can be inferred from data on LG members. This might suggest some bias in reporting and the limitations of self-reported information.

During this study, we also found that farmer's ability to record data is still very limited. This is an area that the programmewould do well to invest resources and time in developing training programs to help farmers in this area. This is particularly important in light of the push back

we faced from many farmers on the amount of time they had to spend to give us the data we needed. In addition to the farmers, future evaluations of the programme would benefit greatly from farmers getting more comfortable with data.

We also discovered that farmers see great value in producer companies. They believe they will help greatly with marketing along with also helping with almost every stage of cotton cultivation. This might be a dimension that the programmemight do well to focus on. This is particularly important as given the remarkable improvements in the last year, it is likely that many of the quick and easy changes have already been adopted. The next stage of improvement will likely be slower and come at a higher marginal cost of effort and resources. This is particularly true of changes in gender equality, child labour and decent work that have a social component. These changes will require more sustained interaction with farmers

Annexures

A1. Terms of Reference for Outcome Evaluation

1. Purpose and Scope of the assessment

The purpose of this assignment is to assess whether all the project activities were successfully implemented and measure the changes that can be attributed to the current GIZ funded BCI programme promoting better cotton farming practices in Maharashtra, through an independent third-party evaluation.

The assignment shall focus on conducting end line data collection, draw a comparison between the baseline and endline observations and present the findings in the form of a formal report.

A baseline study was conducted for a sample of **2000 farmers** in October 2019. For the purpose of this evaluation, the endline data collection should ideally include the same 2000 farmers.

In line with the GIZ programme indicators, we expect the data collection and the final report to include the following dimensions,

- Farmer's Income
- Cotton Productivity
- Cotton cultivation practices
- Knowledge of environmental practices & decent work
- Employment generation
- Gender equality
- Capacity building of Implementation partner's staff
- Capacity building of farmers
- Continuous improvement plans of Producer Units
- Farmer meetings
- Local supply chain & market linkages in cotton
- Farmer data collection

Available documents are: Project documents, Farmer lists, raw baseline data, draft and final baseline reports.

2. Methodology

The Evaluation consultant will be responsible for the design of the evaluation methodology, which should be detailed in the **technical proposal**. This must include sampling methodology, sample size*, data collection approach, data validation and quality checks, analysis, etc.

*Note: It is advisable to use the complete sample set of the baseline study for conducting the endline, unless sampling methodology clearly ensures that new sample set shall not bias the findings.

3. Criteria and key questions

The following criteria will guide the key questions to be asked:

Relevance: How well has BCI-GIZ response been meeting the needs of the affected population? How well is the program adapting to changing needs over time?

Effectiveness: Whether the planned activities and expected benefits have been delivered and received, as perceived by all key stakeholders.

Results: To what extent the planned goals have been achieved, and how far that was directly due to the project; if there were unplanned results, how they affected the overall results;

Sustainability: The extent to which the benefits are likely to continue after the project.

Efficiency: How well the various activities transformed the available resources into the intended outputs, in terms of quantity, quality and timeliness? What are the recommendations?

4. Reporting, Duration & Location:

During the course of the assignment, the organization shall report to Mr. Mithilesh Kandalkar, BCI-GIZ Programme Coordinator.

Activity	Tentative Timeline
Deadline for submission of proposals	04 August 2020
Selection of consultant	07 August 2020
Start of assignment	19 August 2020
Inception Report	04 September 2020
First draft of the endline report sent to BCI	16 October 2020
Final version of the endline report sent to BCI	31 October 2020

Final timeline shall be specified in the contract.
Location: Maharashtra, India – Specifically multiple villages of Nagpur, Chandrapur, Dhule & Nandurbar districts

5. Deliverables:

Deliverables should include the following:

- An evaluation work plan, including planned timeline, methodology / approach, planned stakeholders to be consulted and sampling framework, data collection and analysis tools, qualitative and quantitative protocols for data collection and analysis
- Any suggested improvements to existing evaluation scope, as outlined in this document
- Presentation of preliminary findings
- Draft evaluation report written in English that meets the requirements outlined below
- One (1) electronic file of the clean (final) qualitative and quantitative data collected
- Final evaluation report
- Case Studies: At least 6-7 case studies of beneficiaries, briefly assess the influence on individual beneficiaries through better cotton farming practices, represented in the form of qualitative paragraphs with "success stories".
- Interviews with stakeholders: Interviews of the IP Coordinators/PU managers can be conducted. The main purpose for employing this methodology is to understand

the outcomes of BCI-GIZ programme both from the perspective of those involved and how they have benefited or been affected by these interventions of this programme.

The final evaluation report should be jargon free, clear and simply written. We encourage short but precise content; heavy textual reporting should be avoided. Technical information should be included in appendices only. Analysis of project achievements should always be backed up with relevant data, with reference to the data source. Recommendations should be specific and include relevant details for how they might be implemented

The suggested structure of the report is as following:

- Executive summary
- Brief project background
- Methodology
- Main findings relating to the evaluation questions and including detail of comparison of the baseline to end-line farmer status
- Conclusions, lesson learned and recommendations
- Case Studies

In addition, following Annexes are expected

- Terms of Reference for final evaluation
- Itinerary
- List of meetings attended
- List of persons interviewed
- Details of evaluation methodology
- Summary of field visits
- List of documents reviewed
- Any other relevant material, including data collection tools

Above list is suggestive, any additional relevant information is acceptable.

In addition to the report in Word version, a summarized version of the report in the form of presentation would be welcome.

6. Profile of Consultancy team

Team Leader:
- Must hold a postgraduate degree in education, research, Project Management or any other relevant field;
- Must have at least 8 years professional work experience in the areas of programme evaluation, especially in agronomy, ecology, training & capacity building measures and rural development.
- Extensive conceptual and methodological skills and experience in applying qualitative and quantitative research evaluation methods;
- Prior impact assessment experience is required;
- Experience in organizational management, structures and systems, operations, capacity development, reporting, and monitoring is desired but not essential
- In country or regional similar work experience will be an added advantage

- Excellent communication skills necessary for building rapport with stakeholders, facilitating participation and effective presentation of result to diverse audience.

Team Members
- Proven practical experience in project/program evaluation particularly in participatory evaluation.
- Shelter background and experience evaluating similar projects.
- Advanced degree (preferred) in Social Development/Statistics/Economics or related field.
- Minimum 3 years of experience with quantitative and qualitative research and experience in the agricultural supply value chain project.
- Ability to analyze, synthesize and to write clear reports.
- Good knowledge of the NGOs management in general and familiarity with organizational development.
- Enough knowledge of the political and socio-economic situation in Maharashtra

7. Payment Terms

30% of the budget as advance after signing of the contract and submission of advance invoice	Upon signing of Contract
70% of the budget after completion of the assignment period	Upon submission of approved report, as per the timeline

8. Confidentiality

All information and documentation given to the Consultant is strictly confidential and may be used only for the purposes of completing this assignment.

9. Proposal Submission and Contact Details

In the proposal, please provide the following:
- A succinct, well-documented technical proposal covering
  o Clear description of the project team, relevant experience of team members
  o Research methodology,
  o Activities and corresponding timeline
  o Budget with a break-down in personnel-wise applicable man days & honorarium, proposed travel including travel & daily allowances. *A financial proposal format is attached for your reference*
- References and sample of previous work

A2. Questionnaires for Data Collection

Set 0: Better Cotton Agronomics

Project Participant (Treatment Group) Questionnaire

0. Interview Details		
S. No.	**Question**	**Response**
0.1	Date of Interview	
0.2	Name of Enumerator	
0.3	District	01- Chandrapur — 02- Nagpur — 03- Nandurbar
0.4	Block	01- Badrawati — 05- Hingna — 08- Akkalkuwa
		02- Chandrapur — 06- Kalameshwar — 09- Nandurbar
		03- Chimur — 07- Nagpur (Rural) — 10- Navapur
		04- Warora
0.5	Village name	
0.6	Respondent Baseline Data Sl. No.	
0.7	PU Code	
0.8	Respondent Farmer Code	
0.9	Respondent Mobile Code	
0.10	Respondent Full Name (In Capital Letters)	(First Name) / (Middle Name) / (Last Name)
0.11	Respondent Age	
0.12	Year of enrolment	

1. Landholding & Cropping Details (in Acre)									
Crop	Owned			Leased-In			Total		
	Irrigated	Rain-fed	Total	Irrigated	Rain-fed	Total	Irrigated	Rain-fed	Total
Cotton									
Intercrop, if any									
Kharif 1 Crop									
Kharif 2 Crop									
Rabi 1 Crop									
Rabi 2 Crop									
ADDITIONAL REMARKS									

Intercrop with Cotton
Crop Name:

Rabi Crop in Rotation with Cotton
Crop Name:

Remarks:	Remarks:

*Irrigated land – which is irrigated manually through borewell, tube-well, canal etc.

1.1 What irrigation practice do you follow for cotton?	
Type of Irrigation	**Area (in Acre)**
Flood Irrigation	
Furrow Irrigation	
Drip Irrigation	
Sprinkler Irrigation	

2. Farm Assets Ownership and Testing			
2.1	Which of these farm machines do you own? (multi-code)		01- Tractor 02- Cultivator 03- Harrower 04- Seed/fertiliser drill 05- Thresher 06- Harvester 07- Baler 08-Mulcher 09- Other (Please specify) _____
2.2	How much have you spent on the machines you own in the last year? (loan interest, maintenance, fuel etc.)		
2.2.1	Do you get soil testing done for your farm?		01- Yes 02- No
2.2.2	How much it cost you your soil tested?		

3. Cotton Cultivation Details

3.1 Land Preparation Cost

Operation	No. of Labourer Used (per Acre)	No. of Days Worked (per Acre)	Cost per Labour (INR per Day)	Farm Machinery Used (hired, not owned)	No. of Days	Cost of Machinery per Day (INR)
Ploughing						
Tilling						
Making Ridges / Furrows						

1. Tilling machines run their blades through the soil. On the other hand, ploughing flips the soil
3. Farm machinery cost includes the cost of the person operating it

3.2 Irrigation Cost

Cost of Diesel per Acre	Cost of Electricity per Acre	Cost of Water per Acre	Total (INR)

3.3 Seed Details & Cost

Type & Name of Seed Variety	Area planted with Variety (Acre)	Seed Rate (Kg/Acre)	Cost of seed (INR Per Kg)	Whether Seed Treated by Self	Cost of Seed Treatment (INR)
Hybrid Variety					
BT Variety					

Local Variety						

	3.4 Weeding Practice & Cost			
3.4.1	What type of Weeding Practice do you adopt for Cotton? (Multi-code)	01-Manual 02- Weedicide / Herbicide		
3.4.2	If Manual Labour used for Weeding, please provide the Cost Details-			

Number of Labourers Used	Number of Days Worked	Cost per Labour per Day (INR)

	3.4.3	If Weedicide/Herbicide used for Weeding please provide the Cost Details

Brand Name of Weedicide / Herbicide	Area on which Used (in Acre)	Quantity used per Acre (Litre or KG)	Cost per Litre or KG (INR)

	3.5 Pesticide Usage & Cost		
3.5.1	What do you use as Pesticide for your Cotton? (Single Code)	01- Chemical Pesticide 02- Organic / Bio-Pesticide 03- Both	

3.5.2	Please provide details of the Cost of Pesticide used for Cotton?

Pesticide Used	Amount Used (in Litre OR Kg)	Cost per Kg OR Litre (INR)

3.5.3	Do you use IPM techniques such as Pheromone Traps / Sticky Traps etc. for Cotton?	01- Yes, 02- No
3.5.4	If Yes, please provide details of the Cost?	

Sticky Trap (Total Cost in INR)	Pheromone Trap (Total Cost in INR)

3.5.5	How important do you think are the bio-control methods	01 – Critical, 02 – Supplementary

Integrated Pest Management (IPM) is an integrated approach to tackle pest and reduce usage of chemical pesticide by using a combination of cultural, mechanical and biological technique

	3.6 Fertiliser Practices	
3.6.1	What do you use as Manure / Fertiliser for Cotton (Multi code)	01- Cow Dung; 02- Vermicompost; 03- Chemical Fertiliser (DAP, Urea, SAP etc); 04- Others
3.6.2	Please provide details of the Cost of Fertilizers in Cotton?	

Fertilizer Used	Area (In Acre)	Amount Used per Acre (in KG)	Cost per Kg
DAP			
Urea			
Other Fertilizer Complex (NPK)			
Organic Manure			

	3.7 Harvesting Practices (Cost & Revenue)
3.7.1	Please provide details of your Revenues from Cotton

	Seed Cotton per Acre (in Quintals)	Selling Price of Seed Cotton (per Quintal)	Lint Cotton per Acre (In Quintal)	Selling Price of Lint Cotton (per Quintal)

3.7.2	Please provide details of Cost of Harvesting Cotton				
	No. of Labourers Engaged	No. of Days	Cost of Labourer per Day	Machinery Used	No. of Days of Machinery Use	Cost / Rent of Machinery per Day

3.7.3	Please provide the details of other Costs incurred during Sale of Harvested Produce

Cost of Storage (per Quintal)	Cost of Transportation (per Quintal)

3.7.4	Do you have crop insurance? (single code)	01 - Yes, 02 - No
3.7.4.1	How much did you pay towards crop insurance premium for the year 2019-20?	
3.7.5	Have you taking any loans for farming related activities?	01 - Yes, 02 - No
3.7.5.1	How much interest did you pay for this loan in the year 2019-20	

Counterfactual Group Questionnaire

0. Interview Details				
S. No.	**Question**	**Response**		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**01- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			
1. Landholding & Cropping Details (in Acre)				

Crop	Owned			Leased-In			Total		
	Irrigated	Rain-fed	Total	Irrigated	Rain-fed	Total	Irrigated	Rain-fed	Total
Cotton									
Intercrop, if any									

Kharif 1 Crop									
Kharif 2 Crop									
Rabi 1 Crop									
Rabi 2 Crop									

ADDITIONAL REMARKS	
Intercrop with Cotton	**Rabi Crop in Rotation with Cotton**
Crop Name:	Crop Name:
Remarks:	Remarks:

*Irrigated land – which is irrigated manually through borewell, tube-well, canal etc.

1.1 **What irrigation practice do you follow for cotton?**	
Type of Irrigation	Area (in Acre)
Flood Irrigation	
Furrow Irrigation	
Drip Irrigation	
Sprinkler Irrigation	

2. Farm Assets ownership and Testing		
2.1	Which of these farm machines do you own? (multi-code)	01- Tractor 02- Cultivator 03- Harrower 04- Seed/fertiliser drill 05- Thresher 06- Harvester 07- Baler 08-Mulcher 09- Other (Please specify)
2.2	How much have you spent on the machines you own in the last year? (loan interest, maintenance, fuel etc.)	
2.2.1	Do you get soil testing done for your farm?	01- Yes 02- No
2.2.2	How much it cost you your soil tested?	

3. Cotton Cultivation Details						
3.1 Land Preparation Cost						
Operation	No. of Labourer Used (per Acre)	No. of Days Worked (per Acre)	Cost per Labour (INR per Day)	Farm Machinery Used (hired, not owned)	No. of Days	Cost of Machinery per Day (INR)
Ploughing						
Tilling						
Making Ridges / Furrows						

1. Tilling machines run their blades through the soil. On the other hand, ploughing flips the soil
3. Farm machinery cost includes the cost of the person operating it

3.2 Irrigation Cost

Cost of Diesel per Acre	Cost of Electricity per Acre	Cost of Water per Acre	Total (INR)

3.3 Seed Details & Cost

Type & Name of Seed Variety	Area planted with Variety (Acre)	Seed Rate (Kg/Acre)	Cost of seed (INR Per Kg)	Whether Seed Treated by Self	Cost of Seed Treatment (INR)
Hybrid Variety					
BT Variety					
Local Variety					

3.4 Weeding Practice & Cost

3.4.1	What type of Weeding Practice do you adopt for Cotton? (Multi-code)	01-Manual 02- Weedicide / Herbicide
3.4.2	If Manual Labour used for Weeding, please provide the Cost Details-	

Number of Labourers Used	Number of Days Worked	Cost per Labour per Day (INR)

3.4.3	If Weedicide/Herbicide used for Weeding please provide the Cost Details

Brand Name of Weedicide / Herbicide	Area on which Used (in Acre)	Quantity used per Acre (Litre or KG)	Cost per Litre or KG (INR)

3.5 Pesticide Usage & Cost

3.5.1	What do you use as Pesticide for your Cotton? (Single Code)	01- Chemical Pesticide 02- Organic / Bio-Pesticide 03- Both
3.5.2	Please provide details of the Cost of Pesticide used for Cotton?	

Pesticide Used	Amount Used (in Litre OR Kg)	Cost per Kg OR Litre (INR)

3.5.3	Do you use IPM techniques such as Pheromone Traps / Sticky Traps etc. for Cotton?	01- Yes, 02- No
3.5.4	If Yes, please provide details of the Cost?	

Sticky Trap (Total Cost in INR)	Pheromone Trap (Total Cost in INR)

3.5.5	How important do you think are the bio-control methods	01 – Critical, 02 – Supplementary

Integrated Pest Management (IPM) is an integrated approach to tackle pest and reduce usage of chemical pesticide by using a combination of cultural, mechanical and biological technique

3.6 Fertiliser Practices

3.6.1	What do you use as Manure / Fertiliser for Cotton (Multi code)	01- Cow Dung; 02- Vermicompost; 03- Chemical Fertiliser (DAP, Urea, SAP etc); 04- Others _____
3.6.2	Please provide details of the Cost of Fertilizers in Cotton?	

Fertilizer Used	Area (In Acre)	Amount Used per Acre (in KG)	Cost per Kg
DAP			
Urea			

	Other Fertilizer Complex (NPK)			
	Organic Manure			
	Vermi-compost			

3.7 Harvesting Practices (Cost & Revenue)

3.7.1		Please provide details of your Revenues from Cotton			
		Seed Cotton per Acre (in Quintals)	Selling Price of Seed Cotton (per Quintal)	Lint Cotton per Acre (In Quintal)	Selling Price of Lint Cotton (per Quintal)

3.7.2		Please provide details of Cost of Harvesting Cotton					
		No. of Labourers Engaged	No. of Days	Cost of Labourer per Day	Machinery Used (hired/not owned)	No. of Days of Machinery Use	Cost / Rent of Machinery per Day

3.7.3		Please provide the details of other Costs incurred during Sale of Harvested Produce	
		Cost of Storage (per Quintal)	Cost of Transportation (per Quintal)
3.7.4		Do you have crop insurance? (single code)	01 - Yes, 02 - No
3.7.4.1		How much did you pay towards crop insurance premium for the year 2019-20?	
3.7.5		Have you taking any loans for farming related activities?	01 - Yes, 02 - No
3.7.5.1		How much interest did you pay for this loan in the year 2019-20	

4.2 Employment Conditions

4.2.1	Are you aware about the legally applicable minimum wage?	01- Yes; 02- No; 03- Don't know
4.2.2	What is the current minimum wage? (INR per Day)	
4.2.3	What is the current minimum wage for women? (INR per Day)	
4.2.4	Is there any difference in local wage rate across men and women?	01- Yes ; 02- No; 03- Don't know
4.2.5	Is there is a difference in wage rate for a man aged 20 and aged 30?	01- Yes; 02- No; 03- Don't know
4.2.6	Is there is a difference in wage rate for a woman aged 20 and aged 30?	01- Yes; 02- No; 03- Don't know

4.3 No Forced/ Child Labour (below 14 years)

4.3.1	Are you aware of the law which prohibits employment of child labour with age below 14 years?	01- Yes; 02- No; 03- Don't know
4.3.2.1	Are you aware of any member of your learning group employing child labour with age lower than 14 years?	01- Yes; 02- No; 03- Don't know
4.3.2.2	If yes, have these children received appropriate training for the work?	01- Yes; 02- No; 03- Don't know

4.4 Inclusion and Equitable Participation of Women

4.4.1	Please provide your response to the following statements related to inclusion of women in cotton cultivation.					
	Statement	Disagree	Largely Disagree	Partially Disagree / Agree	Largely Agree	Agree
	Women provide substantial labour input in cotton cultivation as 'unpaid' family labour or low-paid day labourers					

	Women commonly perform some of the most unwanted or tiring tasks, with high representation in manual work such as picking and weeding				
	Women are frequently paid less than their male counterparts, despite the crucial role they play in the labour force				
	Women are less likely to be considered for wage increases & other work-based benefits				
	Views of women are usually overlooked in decision-making on economic, financial or technical matters				
	It is very difficult for women to be involved in cotton cultivation				
	The number of women involved in my cotton farm(s) is increasing over time				
	Things are becoming easier for women working in cotton cultivation due to higher sensitivity of Producers about their issues				

Set 1: Better Cotton Environmental & Agronomic Practices

Project Participant (Treatment Group) Questionnaire

0. Interview Details				
S. No.	**Question**	**Response**		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**01- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			

1. Other Information on Cultivation Practice		
S. No.	**Question**	**Response**
1.1 Soil testing		
1.1.1	Are you aware about soil testing?	01- Yes 02- No
1.1.2	Do you get soil testing done for your farm?	01- Yes 02- No
1.1.3	When was the most recent soil testing done for your farm? **(Single code)**	01- After March 2019 02- Between March 2018 and March 2019 03- Before March 2018 04- Never
1.1.4	What do you consider to be the idle frequency for soil testing?	01- Before Every Crop Season 02- Once Every Year 03- Once Every Two Years

		04- Once Every Three Years
1.1.5	How do you make use of soil testing report? **(Multiple code)**	01- To plan usage of NPK fertilizers 02- To plan usage of compost / manure 03- To plan other measures for soil improvement 04- Not sure / Don't know

1.2 Intercropping

1.2.1	Do you practice intercropping with Cotton? **(Single code)**	01- Yes 02- No
1.2.2	If Yes, please provide the details of crops and area in which intercropping or crop rotation with Cotton is done-	

Crop Name	Area Intercropped with Cotton (in Acre)	Area in Rotation with Cotton (in Acre)

2. Soil Health Management

2.1	Kindly indicate the level of adoption of the following soil health management measures within your learning group									

Soil Health Management Measure	Your Practice	No. of Members Adopting within Learning Group							
		High		Moderately High		Medium		Low	
		>30		20-30		10-20		<10	
		CY	PY	CY	PY	CY	PY	CY	PY
Use of soil test reports in planning application of different nutrients									
Use of lime / gypsum to correct the pH value of soil									
Discontinuation of burning of cotton plant residues									
Focus on improving soil organic matter									
Appropriate quantity and timing of application of any fertilizer									
Zero or no tillage conservation tillage or minimum tillage system									

3. Biodiversity Enhancement

3.1	Kindly indicate the level of adoption of the following biodiversity enhancement measures within your learning group									

Biodiversity Enhancement Measure	Your Practice	No. of Members Adopting within Learning Group							
		High		Moderately High		Medium		Low	
		>30		20-30		10-20		<10	
		CY	PY	CY	PY	CY	PY	CY	PY
Integration of planting methods with IPM to support biodiversity									
Protection of riparian areas by setting buffers									

4. Open-ended Questions on Capacity-Building

4.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1.

	2.
	3.

Set 2: Better Cotton Environmental Practices

Project Participant (Treatment Group) Questionnaire

0. Interview Details				
S. No.	Question	Response		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**02- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			

2. Pesticide Protection Measures	
2.1	Kindly indicate the number of applications (no. of times) of the following protection chemicals during the previous two seasons:

Season	Imidacloprid (Imida)	Fipronil	Monocrotophos	Dasparni Ark
2019-20				
2018-19				

2.2	Kindly indicate the level of adoption of the following pesticide protection measures within your learning group

Pesticide Protection Measure	Your Practice	No. of Members Adopting within Learning Group							
		High		Moderately High		Medium		Low	
		>30		20-30		10-20		<10	
		CY	PY	CY	PY	CY	PY	CY	PY

Dedicated areas on farm for storing, mixing, handling pesticides, and for cleaning containers & equipment									
Regular monitoring of crops for pests and crop damage									
Improving beneficial insects by gap filling with castor / sunflower									
Use of border crops (e.g. maize, sorghum etc.) around cotton fields									
Workers using pesticides are trained									
No pesticide containers are used for any household / other purposes									

CY: 2019-20; PY: 2018-19

2.3	Did the pesticide applier use any of the following protective gear? **(Multi-code)**	01- Gloves 02- Mask 03- Cloth for Mask 04- Goggles 05- Safety Kit / PPE 06- Boots 07- Any other (Plz. specify)
2.2.1	Were any of the following health affects reported by applier after pesticide application? **(Multi-code)**	01- Dizziness 02- Headache 03- Nausea 04-Vomiting 05- Fever 06- Eye/Skin irritation 07- Any other (Plz. specify)

3. Irrigation Practices & Water Stewardship

3.1	What is your source of irrigation **(Multi-code)**	01-Tube-well 02- Open/Dug well 03- Canal 04- River 05- Pond 06- Nallah 06- Others (Plz. Specify) _____
3.2	What irrigation practice do you follow for cotton?	

Type of Irrigation	Area (in Acre)
Flood Irrigation	
Furrow Irrigation	
Drip Irrigation	
Sprinkler Irrigation	

3.3	What measures do you adopt for on farm water usage management?	01- Mulching 02- Spreading manure or compost over the soil 03- Alternate furrow irrigation 04- Drip/sprinkler irrigation 05- Any other (Please specify) _____

3.4	Kindly indicate the level of adoption of the following water stewardship measures within your learning group

	Your Practice	No. of Members Adopting within Learning Group							
Water Stewardship Measure		High		Moderately High		Medium		Low	
		>30		20-30		10-20		<10	
		CY	PY	CY	PY	CY	PY	CY	PY
Use of weather forecasts in planning of irrigation									
Irrigation is not carried out as per a rigid, pre-determined schedule									
Recording of irrigation water utilized in Farmer Field Book									

	Analysis / usage of irrigation water usage data to plan water productivity / efficiency methods								
	Monitoring & maintaining water conveyance / storage structures to reduce water wastages								
	Documentation / recording of local water quantity & quality issues								

CY: 2019-20; PY: 2018-19

4. Open-ended Questions on Capacity-Building

4.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1. 2. 3.

Set 3: Farmers' Capacity Building, Family Participation and Cultivation Practices

Project Participant (Treatment Group) Questionnaire

0. Interview Details

S. No.	Question	Response		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**03- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			

1. Capacity Building and Awareness

1.1	Please provide information related to the Capacity Building of Farmers under GIZ-BCI Project

Question	Response

1.1.1	How many members in your learning group?	
1.1.2	How many Learning Group meetings have you attended in the last year?	
1.1.3	How many of the meetings included training or demonstration?	
1.1.4	How many times has your field facilitator visited you?	
1.1.5	How useful do you think is the training provided to you? (can identify specific programs from the document sent by IPs for this question)	01- Did not attend any 02- Not useful at all 03- Somewhat useful 04- Mostly useful 05- Highly / Very useful
1.2	Please indicate your assessment of tools for sensitization and awareness on Better Cotton	

Assessment	Better Cotton Video(s)	Better Cotton Song(s)	Better Cotton Street Play(s)	Dissemination by Loudspeaker
Have not seen / heard				
Do not remember				
Could be much better				
Very helpful / informative				

1.3	Please indicate the level of your interest-to-adopt, ability-to-adopt and actual adoption of the changes in practices suggested by BCI Project?

Level	Interest to Adopt Suggested Changes	Ability to Adopt Suggested Changes	Level of Changes Actually Adopted
Practically none			
A little			
Some			
Many / Most			
Almost All			

1.4	Do you think you use better methods to farm now than 1 year ago? If yes, please indicate why you think so. **(Open-ended question)**

2. Family Members and Labourers in Cotton Cultivation				
2.1	Labour Support on Cotton Farm(s)	Men	Women	Children
	Number of family members engaged as labour on your cotton farm(s)			
	Number of permanent farm labourers			
	Number of temporary farm labourers (in 2019-20 Season)			
3. Cultivation Practices				
3.1	Are you able to ensure the following cultivation practices in cotton crop?			

Better Cotton Cultivation Practices	Never / Rarely	Sometimes	Mostly	Always
Right variety of cotton based on local climatic condition and planting date				
Right planting date based on seasonal conditions and pest behaviour / incidence				
Appropriate seed / planting rate and row spacing based on the variety, soil type and seasonal condition				
Balanced nutrition for the crop in terms of chemical fertilizers and organic matter (manure / compost)				
Appropriate irrigation scheduling				

	Control of disease/insect attack on the crop				
	Weed management				

4. Open-ended Questions on Capacity-Building

4.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1. 2. 3.

Set 4: Farmers' Capacity Building, Employment Conditions and Social Aspects

Project Participant (Treatment Group) Questionnaire

0. Interview Details

S. No.	Question	Response		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**01- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of enrolment			

1. Decent Work Practices

1.1 Non-Discrimination

1.1.1	Have you or anyone in your learning group (LG) suffered any discrimination based on:			
	Basis / Criteria	**Yes**	**No**	**Don't Know**

	Caste			
	Gender			
	Group / Political Association			
1.1.2	How serious is the problem of discrimination in your learning group?	01- I have not seen/heard any 02- Few incidents, minor problem 03- Frequent incidents, regular problem 04- Very frequent incidents, serious problem 05- Something needs to be done urgently		
1.1.3	Was a complaint filed with the producer unit?	01- Yes; 02- No; 03- Don't know		
1.1.4	Are you aware of any action taken by your producer unit against discrimination?	01- Yes; 02- No; 03- Don't know		

2.2 Employment Conditions		
2.2.1	Are you aware about the legally applicable minimum wage?	01- Yes; 02- No; 03- Don't know
2.2.2	What is the current minimum wage? (INR per Day)	
2.2.3	What is the current minimum wage for women? (INR per Day)	
2.2.4	Do you pay your farm workers the minimum wage?	01- Yes ; 02- No; 03- Don't know
2.2.5	Are there any labor used by you whom you do not need to pay but they are also not your family members?	01- Yes; 02- No; 03- Don't know
2.2.6	Are there any labor used by other farmers in your learning group that are not needed to be paid and are also not their family members?	01- Yes; 02- No; 03- Don't know

2.3 No Forced/ Child Labour (below 14 years)		
2.3.1	Are you aware of the law which prohibits employment of child labour with age below 14 years?	01- Yes; 02- No; 03- Don't know
2.3.2.1	Are you aware of any member of your learning group employing child labour with age lower than 14 years?	01- Yes; 02- No; 03- Don't know
2.3.2.2	If yes, have these children received appropriate training for the work?	01- Yes; 02- No; 03- Don't know
2.3.3	Please provide your response to the following statements related to child labour:	

Statement	Yes	No	Don't Know
Working on farms affects the education of children (below 14 years)			
Working on farms affects the health and safety of children (below 14 years)			
BCI principles require the Producer to ensure that children below 18 years do not work in an environment that may expose them to temperatures, noise levels or vibrations which could potentially damage their health			
BCI principles require the Producer to ensure that children below 18 years are not used for lifting or transporting heavy loads			
BCI principles require the Producer to ensure that children below 18 years are not used to work with dangerous machinery			
BCI principles require the Producer to ensure that children below 18 years are not exposed to dangerous chemicals			
Are you aware of the conditions under which Govt. of India allows the use of children to help their family in fields, forests and home-based work?* *After school hours or during vacations, or while attending technical institutions (ITI etc.) such that their education isn't hampered			

2.3.4.1	How many training sessions did you have since April 2019 in which you have received some information on child labour?	
2.3.4.2	Are you aware of the BCI principles / guidelines related to use of child labour on cotton farms?	01- I have not seen/heard any 02- I do not remember most of it 03- I remember the basics 04- I remember most of them 05- I know them and also keep sharing them to inform others

2.4 Inclusion and Equitable Participation of Women		

2.4.1	Please provide your response to the following statements related to inclusion of women in cotton cultivation.					

Statement	Disagree	Largely Disagree	Partially Disagree / Agree	Largely Agree	Agree
Women provide substantial labour input in cotton cultivation as 'unpaid' family labour or low-paid day labourers					
Women commonly perform some of the most unwanted or tiring tasks, with high representation in manual work such as picking and weeding					
Women are frequently paid less than their male counterparts, despite the crucial role they play in the labour force					
Women are less likely to be considered for wage increases & other work-based benefits					
Views of women are usually overlooked in decision-making on economic, financial or technical matters					
It is very difficult for women to be involved in cotton cultivation					
The number of women involved in my cotton farm(s) is increasing over time					
Things are becoming easier for women working in cotton cultivation due to higher sensitivity of Producers about their issues					

2.4.2.1	How many training sessions did you have since April 2019 in which you have received information on fair participation and inclusion of women in cotton cultivation?	
2.4.2.2	Are you aware of the BCI principles / guidelines related to fair participation or inclusion of women on cotton farms?	01- I have not seen/heard any 02- I do not remember most of it 03- I remember the basics 04- I remember most of them 05- I know them and also keep sharing them to inform others

3. Open-ended Questions on Capacity-Building	

3.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1. 2. 3.

Project Participant (Treatment Group) Questionnaire

0. Interview Details				
S. No.	**Question**	**Response**		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**01-Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar
		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			

1. Harvesting Practices (to ensure fibre quality)				
1.1	Are you able to ensure the following during harvesting/storage/transportation of cotton?			

Better Cotton Harvesting Practices	Never	Sometimes	Always
Cotton does not get mixed with dirt / twigs / bark			
Cotton does not get moist			
Cotton is not packed in polythene / plastic / synthetic bags			

2. Market Linkage		
	Question	Response
2.1	Were you able to sell your cotton more easily in 2019-20 compared to the previous year (2018-19)?	01- Yes; 02- No; 03- Can't say
2.2	Do you think it is easier to sell your cotton because you are a better cotton farmer?	01- Yes; 02- No; 03- Can't say
2.3	Whom do you sell your cotton to?	01- Local Trader in Village; 02- Trader in APMC; 03- Ginner; 04- Industrial Buyer
2.4	How much average price (INR per Quintal) did you realize for your seed cotton in 2019-20 season?	
2.5	How much average price (INR per Quintal) did you realize for your seed cotton in 2018-19 season?	
2.4.1	Do you think you could realize higher prices for your cotton produce than farmers who are not part of BCI?	01- Yes; 02- No; 03- Can't say
2.4.2	How much could be the approximate difference in prices (INR per Quintal) for BCI farmers compared to non-BCI farmers?	
2.5	Did any of your buyers waive off loading, unloading and/or weighing charges for BC farmers?	01- Yes; 02- No; 03- Can't say
2.6	What would like to know from your field facilitator to get a better price for your produce? (open ended)	Open ended

	3. Producer Organisations for Collective Marketing						
3.1	Are you aware of Producer Companies being set up for collective marketing of cotton produce by BCI farmers?	01- Yes; 02- No					
3.2	Please provide your response to the following statements which indicate the role of Producer Companies in supporting cotton farmers across a range of activities						

Statement	Disagree	Largely Disagree	Partially Disagree / Agree	Largely Agree	Agree
Producer companies can help cotton farmers to access better quality agri-inputs such as seeds, nutrients and protection chemicals					
Producer companies can help cotton farmers to access higher quality crop and weather advisory services delivered through mobile phones					
Producer companies can help cotton farmers to access agricultural machinery for key operations such as land preparation, sowing, harvesting etc.					
Producer companies can help cotton farmers in reducing or minimizing dependence on middlemen for buying agri-inputs and selling cotton produce thus helping to save margins taken away by these middlemen					
Producer companies can help cotton farmers to aggregate and store cotton after harvest and later transport it to buyers for realizing higher prices					
Producer companies can help cotton farmers to set up ginning units as these producer companies gain better understanding of post-harvest processes					

3.3.1	How many training sessions did you have since April 2019 in which you have received information on role of producer companies and other collective organisations in better marketing of cotton?	
3.3.2	Are you aware of cotton cooperatives in Maharashtra which are into ginning and spinning of cotton?	01- Yes; 02- No

	4. Open-ended Questions on Capacity-Building
4.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1. 2. 3.

Set 6: Better Cotton Value Chain Upgrading and Data Management

Project Participant (Treatment Group) Questionnaire

0. Interview Details				
S. No.	**Question**	**Response**		
0.1	Date of Interview			
0.2	Name of Enumerator			
0.3	District	**01- Chandrapur**	**02- Nagpur**	**03- Nandurbar**
0.4	Block	01- Badrawati	05- Hingna	08- Akkalkuwa
		02- Chandrapur	06- Kalameshwar	09- Nandurbar

		03- Chimur	07- Nagpur (Rural)	10- Navapur
		04- Warora		
0.5	Village name			
0.6	Respondent Baseline Data Sl. No.			
0.7	PU Code			
0.8	Respondent Farmer Code			
0.9	Respondent Mobile Code			
0.10	Respondent Full Name **(In Capital Letters)**	(First Name) / (Middle Name) / (Last Name)		
0.11	Respondent Age			
0.12	Year of Enrolment			

1. Innovations

1.1	Are you aware of the use of technology by Field Facilitators for providing training to you on better cotton practices	01- Yes; 02- No
1.2	If yes, can you recall the name of the mobile app used by Field Facilitators	
1.3	Have you been imparted training on how you can make use of the mobile app for learning and revision of better cotton practices	01- Yes; 02- No
1.4	Do you believe that provision of training through videos on mobile phone or through mobile apps can reduce your dependence on field facilitators?	
1.5	Do you believe that provision of advisory services through mobile phone videos or apps would help in doing away with your dependence on field facilitators for training, advisory and technical support?	01- Yes; 02- No; 03- Can't say
1.6	What are the major benefits of training, advisory & technical support through mobile phone videos or apps? **(Multiple code)**	01- Effectiveness of adoption 02- Speed of adoption 03- Ease / convenience of location 04- Timeliness of access 05- Consistency / clarity of advisory and training content

2. Data Management

2.1.1	Do you fill in your farmer field book (FFB) / farmer diary on time?	01- Yes;　02- No;　03- Mostly; 04- Generally; 05-Sometimes
2.1.2	When / how frequently do you maintain data for FFB or update the FFB?	01- I do not update my FFB and depend on the FF (Field Facilitator) 01- Within 2-3 days of completing any important activity on my cotton farm(s) 02- Every week 03- Every fifteen days 04- Every month 05- Before the visit of Field Facilitator / LG Meeting 06- Once before the end of season
2.1.3	Who records data in the FFB / farmer diary?	01- Don't know 02- Field facilitator records the data 03- I record all the data myself 04- I record with help from the FF (Field Facilitator)

2.1.4	Do you think there are any benefits of recording farm data in FFB?	01- I do not record data 02- It is somewhat useful 03- It is highly useful 04- It has improved my cotton farming in a major way			
2.1.5	How much do you think recording farm data helps with these activities				

	Benefits	Doesn't Help	Helps a Little	Helps Somewhat	Helps a Lot
	Do better planning of crop production				
	Keep track of usage of inputs and resources				
	Keep track of dues, earning and payments				
	Get better and more personalized technical advisory and training based on data of my cotton cultivation				
	Improve income from cotton farming through better management of key financial / economic information				

2.1.5	Did you get any training on how to record data?	01- Yes 02- No 03- Don't know
2.1.6	How many training sessions did you have since April 2019 in which you have received information and guidance on Farmer Field Book?	

3. Open-ended Questions on Capacity-Building

3.1	Do you think you and your fellow farmers have higher capacities to undertake better cotton cultivation today compared to April 2019? If yes, please share some supporting reasons. 1. 2. 3.

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