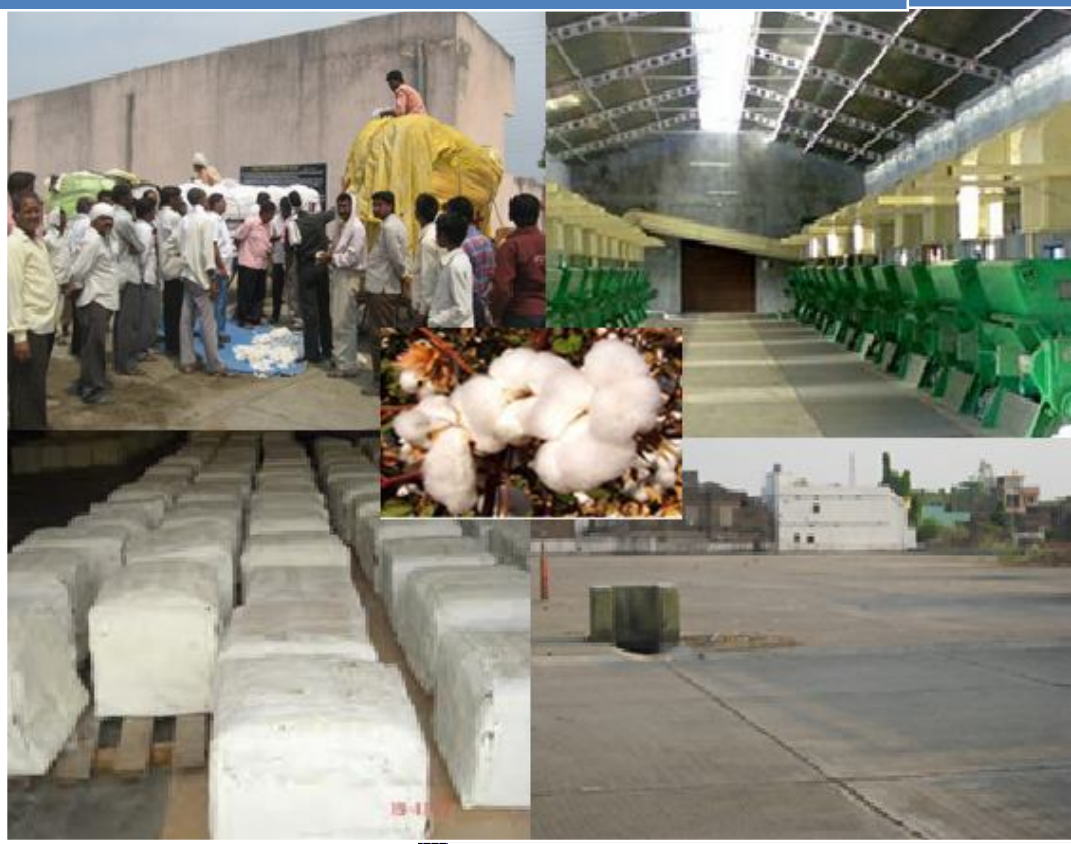
2011

*Final Report*

# Evaluation of Mini Mission III & IV of Technology Mission on Cotton



**ICRA Management Consulting Services Limited**

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# 1. Background of the Study

Cotton is one of the principal crops of the country, and plays a vital role in the Indian economy, providing employment to around 6 million farmers. In addition, around 40-50 million people depend on activities related to cotton cultivation, cotton trade and its processing, for their livelihood[1]. The fibre accounts for nearly 59% of India's total fibre consumption and substantially higher share of India's total textile and clothing exports.

India ranks first in cotton-cultivated area, with around 10.3 million hectares, during 2009-10 Cotton season. The country has witnessed a qualitative and quantitative transformation in the production of cotton since independence. Domestic cotton production has increased substantially to 325 lakh bales (of 170 kg each) in 2010-11 from 30.6 lakh bales in 1950-51, making India the second-largest producer of cotton in the world, after China. Cotton yield in India has improved remarkably to around 503 kg/hectare in 2009-10 (October-September) Cotton Season as against 303.75 kg/hectare in 1999-2000. However, India is far behind the world average of 726 kg/hectare.

The Indian Cotton sector suffered from various deficiencies in the past, including poor quality of seeds, low productivity (yield per hectare), high cost of cultivation, multiplicity of cotton varieties leading to rampant mixing, poor fibre attributes of most varieties, lack of transfer of agricultural technologies to the farmers' fields, poor infrastructure at Market Yards, high trash content in cotton despite being handpicked from the farm, wide range of contaminants in cotton, etc. In order to address these issues in cotton production and processing, and to place the cotton economy on a sound footing, Technology Mission on Cotton was launched in February 2000.

Technology Mission on Cotton (TMC) was launched with the objective of addressing issues related to the increase in productivity, improvement of quality and reduction in the cost of production, thus providing the much-needed competitive advantage to the Textile industry along with ensuring attractive returns to the farmers. The Mission comprised of four Mini Missions (MM) – MM-I, aimed at research and development on cotton, and MM-II, aimed at dissemination of technology to farmers - undertaken by the Ministry of Agriculture; whereas MM-III, aimed at improvement of marketing infrastructure through setting up new Market Yards and activation/improvement of existing Market Yards, and MM-IV, aimed at modernization and technological upgradation of Ginning & Pressing factories - undertaken by the Ministry of Textiles as the Nodal Agency. The Cotton Corporation of India Limited (CCI), a Government of India undertaking, and a leading trading organization dealing in procurement of raw cotton (kapas) and marketing of cotton, was nominated as the implementing agency for Mini Missions III & IV.

The scheme was launched in February 2000 and was initially meant for a term of three years. This term was later extended to March 31, 2007 to coincide with the end of X Five Year Plan, and then again to March 31, 2009 for facilitating the approval of more projects to achieve the targets, and for the completion of slow-going projects. Subsequently, the scheme was accorded a further extension to March 31, 2010 and then till December 12, 2010 to enable the implementing agency to release the TMC shares to all eligible beneficiaries of Mini Missions III & IV as well as to submit the Report.

[1]Source: Ministry of Textiles Annual Report, 2009-10

Mini Mission III of the TMC targeted to develop 250 Market Yards of which 246 projects were completed. Mini Mission IV was assigned a target to modernise 1000 G & P factories of which 859 projects were completed. Funds of Rs. 450.64 crore were released by the Government of India to TMC/CCI of which funds of Rs. 420.65 crore were disbursed by TMC for the purpose of implementation of the scheme. The scheme ended on December 31, 2010.

In order to take a policy decision on continuing the scheme, Ministry of Textiles intend to assess the impact of modernization of Market Yards and Ginning & Pressing factories, and the extent of benefits accrued to various stakeholders of the Cotton sector from the investment made by the Government of India. For the purpose, Ministry of Textiles have commissioned an 'Evaluation study on impact of Mini Mission III &IV of Technology Mission on Cotton', and have engaged the services of ICRA Management Consulting Services Ltd. (IMaCS) to conduct the study.

## 2. Engagement objective

The terms of reference (TOR) for impact evaluation of Mini Mission III & IV of TMC, as given by the Office of Textile Commissioner, Ministry of Textiles, are reproduced below for easy reference:

**Specific to Mini Mission III (development of Market Yard)**

(i) Assess whether there has been any decrease in contamination/foreign materials level due to upgradation/improvements in market yards in the form of pucca roads, pucca platforms, covered sheds for storage of kapas, parking space for carts/vehicles, weighbridge, rest rooms, farmers information centre and cleanliness, etc.

(ii) Assess the level of quality improvement (colour, metal/wire, leaves, feathers, paper, leather, strings made of jute/hessian, fabric made of jute/hessian, woven plastic, sand/dust and moisture content) achieved through creating covered sheds and awareness amongst farmers and market committee officials.

(iii) Evaluate whether there has been better transparency at the market yard level in auction/tender, weighment and grading of kapas.

(iv) Assess whether the farmers have benefited in getting better information regarding use of inputs, transfer of technology, information regarding pricing, etc. wherever the Farmers information Centre (FICs) has been set up.

(v) Assess the quality awareness among farmers through availability of testing facilities for kapas/cotton samples, wherever the Grading Laboratory including HVI has been set up.

(vi) Analyse the increase in kapas arrivals in APMC market yards over corresponding period of previous seasons after improvement in facilities due to awareness.

(vii) Evaluate the impact of setting up of FIC and Grading Laboratory including HVI based on the farmers' awareness and testing of sample received from them.

(viii) Quantify the proportion of village sale vis-à-vis market arrival during the pre and post TMC period.

**Specific to Mini Mission IV (modernisation/upgrading and setting up of new Ginning & Pressing factories)**

(i) Assess the decrease in trash level and other impurities like cut seeds, etc., in percentage in cotton processed in modern G & P factories.

(ii) Assess the decrease in contamination level in percentage/weight in grams per bale in cotton processed in modern G & P factories.

(iii) Analyse whether there has been definite improvement in the cotton processed in terms of uniformity of quality due to removal of short fibre content, kowdy, etc. with the help of kapas cleaner, modern gins and lint cleaners.

(iv) Assess whether the efficiency of packing of bales had become better due to modernized press, pucca platform for storage of bales, etc.

(v) Assess the change in per unit cost per shift for processing kapas into bales.

(vi) Analyse the reduction in man power requirement and contamination/trash content due to automation.

(vii) Analyse the increase in number of bales processed on per shift basis.

(viii) Assess whether the G & P factory owners, who have installed HVI labs, benefited in terms of grading their cotton before sales as compared to those who are not having this facility, and succeeded in realizing better price and higher margin.

**General**

(i) Evaluate the cost benefit ratio of the implementation of MM-III and MM-IV of TMC.

(ii) Assess whether the selection of components of development/modernisation been appropriate/adequate for market yards and ginneries. Which of the components have contributed for quality improvement?

(iii) Suggest any new components for further improvement of market yard and modernization of G & P factories.

(iv) Analyse whether the quantum of financial assistance offered to the Market Yards and ginneries adequate. If not, the justification thereof.

(v) Assess the extent of benefits accrued to the cotton growers, private ginners, cotton merchants, institutions like CCI, State Marketing Federation and Agriculture Department, CIRCOT and TRAs, etc. and the user industry i.e. Textile mills.

(vi) Evaluate whether the expectation of Textile mills in terms of quality of processing and contamination-free cotton been achieved and to what extent.

(vii) Assess whether there is a need to improve the existing Indian Standard, COTTON BALES – SPECIFICATION IS 12171:1999 of BIS.

(viii) Recommend any changes/modifications in the MM-III & IV required to urge the market yards and ginneries that have not shown interest in modernization so far to come forward for modernization.

(ix) Suggest whether there is a need to keep MM-III & MM-IV of TMC in operation in view of likely continuation of MM-I & MM-II of TMC and adoption of mechanical harvesting practices in future.

# 3. Methodology for the study

IMaCS has carried out this study through a mix of primary and secondary research.

## 3.1. Primary research

IMaCS conducted a primary survey of Market Yards and Ginning & Pressing (G & P) factories to evaluate the impact of modernisation. Further, we conducted meetings with various stakeholders of the Cotton industry, including Textile mills, cotton traders, cotton research institutions, textile research institutions, government agencies such as State Marketing Boards, etc. The methodology adopted for the primary research is detailed in the following section.

### Primary survey of Market Yards and G & P factories

The primary survey entailed discussions with Market Yard officials, farmers and management of the G & P factories using semi-structured questionnaires provided as **Annexure 1**.The survey was conducted based on a sample including actual visits and discussions with all the beneficiary Market Yards and G & P factories in the states where number of completed projects was within the range from 1 to 10, and 50% of the total number of beneficiary Market Yards and G & P factories in the states, where the number of completed projects was between 11 and above. Exhibit 1 and Exhibit 2 detail the sampling plan for the primary survey of beneficiary Market Yards and G & P factories, respectively. The data for the remaining beneficiary Market Yards and G & P factories was obtained by email and telephonic discussions.

**Exhibit 1: Sampling plan for the beneficiary Market Yards**

| State | Market Yards developed under MM-III | Coverage during the primary survey |
|---|---|---|
| **Punjab** | 19 | 10 |
| **Haryana** | 20 | 10 |
| **Rajasthan** | 14 | 7 |
| **Madhya Pradesh** | 28 | 14 |
| **Gujarat** | 42 | 21 |
| **Andhra Pradesh** | 48 | 24 |
| **Karnataka** | 13 | 7 |
| **Tamil Nadu** | 4 | 4 |
| **Orissa** | 9 | 9 |
| **Maharashtra** | 49 | 25 |
| **Total** | **246** | **131** |

**Exhibit 2: Sampling plan for the beneficiary G & P factories**

| State | G & P units developed under MM-IV | Coverage during the primary survey |
|---|---|---|
| **Punjab** | 11 | 6 |
| **Haryana** | 5 | 5 |
| **Rajasthan** | 0 | 0 |
| **Madhya Pradesh** | 46 | 23 |
| **Gujarat** | 506 | 253 |
| **Andhra Pradesh** | 22 | 11 |
| **Karnataka** | 13 | 7 |
| **Tamil Nadu** | 1 | 1 |
| **Orissa** | 6 | 6 |
| **Maharashtra** | 248 | 124 |
| **Diu (U.T)** | 1 | 1 |
| **Total** | **859** | **437** |

In addition to the beneficiary Market Yards and G & P factories, IMaCS conducted sample survey of 12 non-beneficiary Market Yards and 15 non-beneficiary G & P factories, ensuring equal representation from all the states. The survey entailed discussions with Market Yard officials and the management of the G & P factories using semi-structured questionnaires provided as **Annexure 1**.

## Discussion with stakeholders of the Cotton industry

IMaCS conducted discussions with various stakeholders of the Cotton industry including Textile mills, cotton traders, cotton research institutions, textile research institutions, government agencies such as State Agricultural Marketing Boards (SAMB), etc. using semi-structured questionnaire provided as **Annexure 1**. The contacts covered during the primary research are given as Exhibit 3.

**Exhibit 3: Stakeholders covered during the primary research**

| S. No. | Organisation | Person contacted | Designation |
|---|---|---|---|
| | **Government agencies** | | |
| **1** | Maharashtra SAMB | Mr. S. P. Sangle | MD |
| **2** | Gujarat SAMB | Ms. Dipti S | GM-Marketing |
| **3** | Karnataka SAMB | Mr. G. Ramachandra | MD |
| **4** | Haryana SAMB | Mr. S. K. Goel | Zonal Marketing Head |
| **5** | Haryana SAMB | Mr. Amar Singh | Sup. Engineer |
| **5** | Punjab SAMB | Mr. G. P. Randhawa | GM-Project |
| **6** | Punjab SAMB | Mr. S. K. Arora | Superintendent Engineer |
| | **Cotton traders and Textile mills** | | |
| **7** | Kotak Cotton & Co. | Mr. Suresh Kotak | Chairman |
| **8** | Sagar Group | Mr. S.S. Stalekar | Vice President-Cotton |
| **9** | Manjeet Cotton | Mr. Saumil Parikh | Head-Exports |
| **10** | Bhaidas Cursondas Co. | Mr. Shirish R. Shah | Partner |
| **11** | MITTATEX | Mr. Anuj Mittal | MD |

| S. No. | Organisation | Person contacted | Designation |
|---|---|---|---|
| **12** | Premier Mills | Mr. Kamala Kannan | Senior Manager |
| **13** | Gill & Co. | Mr. Sudhir Shah | Export Manager |
| **14** | Gill & Co. | Mr. Afsal | Senior Manager |
| **15** | Alok Industries Ltd. | Mr. Anil Nair | VP-Marketing |
| **16** | Alok Industries Ltd. | Mr. Sapan Mukerjee | CEO-Spinning |
| **17** | GTN Textiles Ltd. | Mr. B.K. Patodia | Chairman & MD |
| **18** | GTN Textiles Ltd. | Mr. M.P. Gajaria | Advisor |
| **Industry associations, Export promotion council and Industry experts** | | | |
| **19** | Cotton Association of India | Mr. Dhiren Seth | President |
| **20** | The South Indian Cotton Association | Mr. A. Ramani | President |
| **21** | All Gujarat Cotton Ginners Association | Mr. Dilip Patel | President |
| **22** | Madhya Pradesh Association of Cotton | Mr. Kailash Agarwal | President |
| **23** | Andhra Pradesh Cotton Association | Mr. Punnia Chaudhary | President |
| **24** | Khandesh Gin Press & Traders Development Association | Mr. Pradeep Jain | President |
| **25** | Confederation of Indian Textile Industry (CITI) | Mr. D. K. Nair | Secretary General |
| **26** | Industry expert | Mr. K. R. Krishna Iyer | Ex-TMC Cell Member |
| **27** | Industry expert | Dr. B.M. Vithal | Ex-TMC Cell Member |
| **28** | TEXPROCIL | Mr. Amit Ruparelia | Chairman |
| **Research institutions and Cotton testing laboratories** | | | |
| **29** | ATIRA | Dr. Chikani | Head-Instrumentation |
| **30** | ATIRA | Ms. Seema Patel | Head-Textile Testing |
| **31** | CIRCOT | Dr. Jadhav | Scientist |
| **32** | Wakefield Inspection Services | Mr. Suresh Dholakia | Director |
| **Machinery manufacturers** | | | |
| **33** | Bajaj Steel Industries | Mr M. K. Sharma | President |

## 3.2. Secondary research

IMaCS analysed the scheme documents and information provided by CCI and the Office of the Textile Commissioner. We also analysed the information obtained from various associations of the user industries and research reports of reliable agencies.

***Section I***

# Evaluation of Mini Mission-III of Technology Mission of Cotton

# 4. Evaluation of Mini Mission-III of Technology Mission on Cotton

## 4.1. Introduction

Mini Mission-III was launched with the objective to improve the quality of cotton through development of proper infrastructure facilities in cotton Market Yards whereby contamination of cotton could be averted. Agricultural Produce Market Committees (APMCs) with an annual minimum arrival or production of 75,000 quintals of cotton in the catchment area of the Market Yard were eligible for availing the same.

Under Mini Mission-III, TMC provided financial assistance for Market Yard development to achieve the standards of an ideal Market Yard specified by TMC, as detailed in the following section. The cost for Market Yard development was shared in the ratio of 60:40 between Government of India (GoI) and the concerned APMC/State Government, with the share of GoI having a ceiling of Rs. 90 lakh for "Improvement" category and Rs. 150 lakh for "New Market" category. During IX Plan, another type of development was "Activation" of dormant Market Yard with a cap of Rs. 25 lakh as GoI share.

**Components of an ideal Market Yard**

**A. Essential infrastructure**

1. ***Large area:*** Every Market Yard was required to have sufficiently large area to permit easy movement of trucks, carts, etc. and for constructing all required civil infrastructure.
2. ***Pucca roads:*** It was necessary for a Market Yard to have pucca roads for easy movement of carts, tractor trolleys and lorries for bringing cotton to the Market Yard.
3. ***Pucca platforms:*** Concrete platforms of adequate area were to be provided for stacking different lots of kapas and keeping them till they are finally sold.
4. ***Large capacity weigh bridge:*** There was need to have a weigh bridge with large capacity (preferably electronic) at the entrance to the Market Yard where cotton in tractor trolleys/trucks could be weighed to enable the farmer to know how much cotton he has brought for sale.
5. ***Small capacity weigh bridges****:* Market Yard preferably should have sufficient number of small weigh bridges for instant weighment of cotton brought in bullock carts.
6. ***Parking place:*** Parking place for trucks, tractors, bullock-carts, etc. was an essential requirement in every market. The parking lots were to be far away from kapas platforms such that contamination was rendered unlikely.
7. ***Grading laboratory:*** Small laboratories equipped with trash analysers, small gins and ginning percentage balances were provided in all cotton markets. Some large markets were also provided with HVI/MVI machine for fibre quality testing, in addition to other machines.
8. ***Input supply shops:*** These shops were intended to provide reasonably priced good quality farm inputs like seeds, pesticides, fertilizers, bio-agents etc. for the benefit of farmers.
9. ***Farmers' Information Centre (FIC):*** Equipment provided in FICs included computer with internet access, kiosk with software package in local languages and Interactive Voice Response System (IVRS). FICs provide information on the availability and application of seeds, fertilizers, pesticides, bio-agents, farm operations, pest management, market information, etc.

**Subsequently this item was shifted to optional category.**

10. ***Fire fighting system:*** To ensure fire safety, every cotton market was required to have adequate number of fire hydrants with hosepipe and nozzles at strategic locations, water tank and electric pump besides a standby diesel pump.

**B. Essential amenities:**

Amenities like rest house, canteen and drinking water for farmers and also water and fodder for their cattle were also provided in Market Yards.

**C. Optional/desirable infrastructure:**

1. ***Sheds:*** Roofed sheds were provided in Market Yards to help overnight storage of cotton in case the farmer is unable to sell the material on a particular day.

2. ***Warehouse facility:*** Creation of warehouse for storing unsold cotton was also included in Market Yard projects under MM-III.

**D. Other requirements of an ideal Market Yard:**

1. ***Daily auction system:*** Daily auction system was required to be introduced by the Market Committee wherever it did not exist already.

2. ***Maintenance of records:*** The Market Committee is required to maintain all records concerning transactions and submit prescribed returns to the concerned State authorities.

3. ***Elected Market Committee:*** Every market should have a functioning, elected Market Committee.

4. ***Timely payment to farmers:*** APMC's should ensure that farmers receive the payment for their produce within one week of open auction.

5. ***Insurance scheme:*** Kapas brought by farmers for sale are required to be covered under insurance scheme for a period till its ownership is transferred to the buyer.

6. ***Sufficient staff:*** APMC should engage sufficient staff for day-to-day activities in the Market Yard.

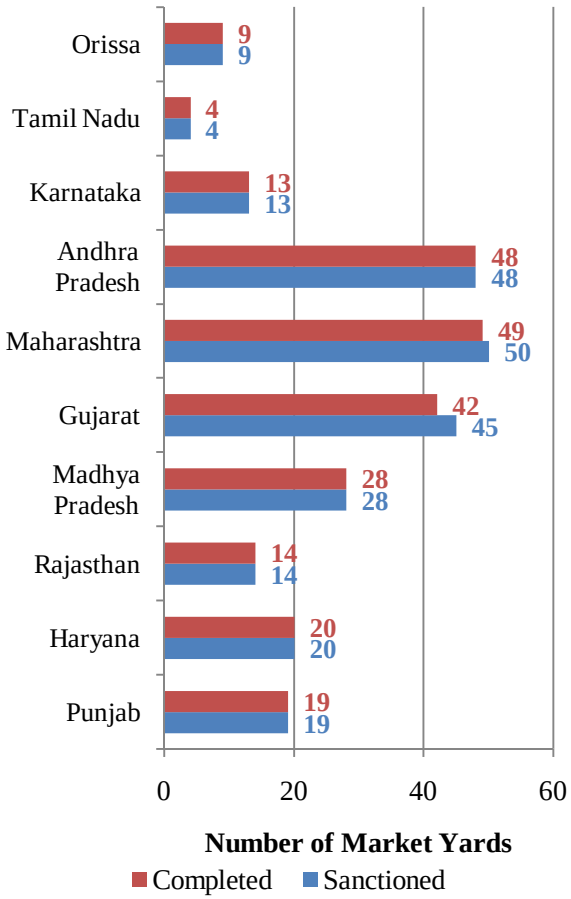
7. ***Cleanliness/maintenance:*** APMC should own the responsibility for maintenance of the infrastructure set up in the market yard and ensure cleanliness in the premises.

## Performance of the scheme

Mini Mission-III achieved development/ modernisation of 246 Market Yards, achieving 98.4% of the set target of 250 Market Yards; 242 projects reported completion whereas four reported partial completion, and were considered as "deemed complete". The remaining four APMCs (one in Maharashtra and three in Gujarat) had not done any work and their projects were treated as cancelled. Exhibit 4 gives the state-wise implementation of the scheme. The said development/modernisation was achieved with a financial outlay of Rs. 231.42 crore.

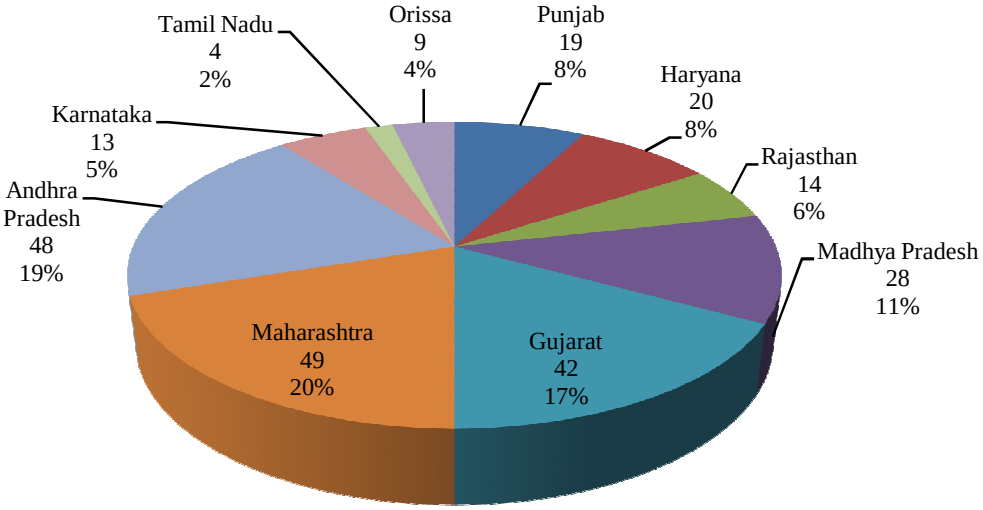
Of the total Market Yards benefited under the scheme, Maharashtra accounted for the largest share of 20% (50 Market Yards), followed by Andhra Pradesh (19%, 48 Market Yards) and Gujarat (18%, 45 Market Yards), as seen in Exhibit 5.

**Exhibit 4: State-wise implementation of MM-III**




*Source: TMC*

**Exhibit 5: State-wise share of Market Yards upgraded/modernised under MM-III**




*Source: TMC*

## 4.2. Assessment of impact of MM-III

In accordance with the terms of reference, IMaCS evaluated MM-III on the following three facets:

### 1. Benefits accrued from the Scheme

This encompassed impact of the Scheme on the following parameters:

- Cotton quality, including
  - whether there has been any decrease in contamination/foreign materials level due to upgradation/improvements in market yards in the form of pucca roads, pucca platforms, covered sheds for storage of kapas, parking space for carts/vehicles, weighbridge, rest rooms, farmers information centre and cleanliness, etc.
  - level of quality improvement (colour, metal/wire, leaves, feathers, paper, leather, strings made of jute/hessian, fabric made of jute/hessian, woven plastic, sand/dust and moisture content) achieved through creating covered sheds and awareness amongst farmers and market committee officials.
- Transparency at the market yard, with regards
  - auction/tender
  - weighment
  - grading
- Farmer awareness
- Utilisation of Farmer Information Centre (FICs), and its impact on farmer awareness
- Utilisation of grading laboratory, and its impact on farmer awareness
- Cotton arrivals in Market Yard vis-à-vis village sale of cotton
- Availability of good quality, contamination-free cotton for the Textile industry

### 2. Appropriateness of the Scheme

This encompassed the following parameters:

- Appropriateness of the components of the Scheme, including,
  - Whether the selection of components of development/modernisation were appropriate/adequate for Market Yards?
  - Which of the components have contributed for quality improvement?
  - Whether any new components are required for further improvement of Market Yard?
- Appropriateness of financial assistance given under the Scheme
- Appropriateness of the Scheme in light of adoption of mechanical harvesting in future

### 3. Need for continuation of the Scheme

This encompassed assessment of the need to keep MM-III of TMC in operation in view of likely continuation of MM-I & MM-II of TMC.

### 4.2.1. Benefits accrued from the Scheme

#### 4.2.1.1. Impact on cotton quality

IMaCS analysed the impact of upgradation/improvement in Market Yards on the overall cotton quality including contamination, moisture content and colour of cotton.

**Level of contamination**

Upgradation/improvement in Market Yards in the form of pucca roads, pucca platforms, covered sheds for storage of kapas, parking space for carts/vehicles, weigh bridge, etc. has decreased the level of contamination that was initially added at the Market Yards. Over 40% of the Market Yard officials confirmed that improvement/upgradation has led to reduction in contamination to a great extent, whereas over 50% confirmed that contamination has reduced to some extent, as evident from Exhibit 6.

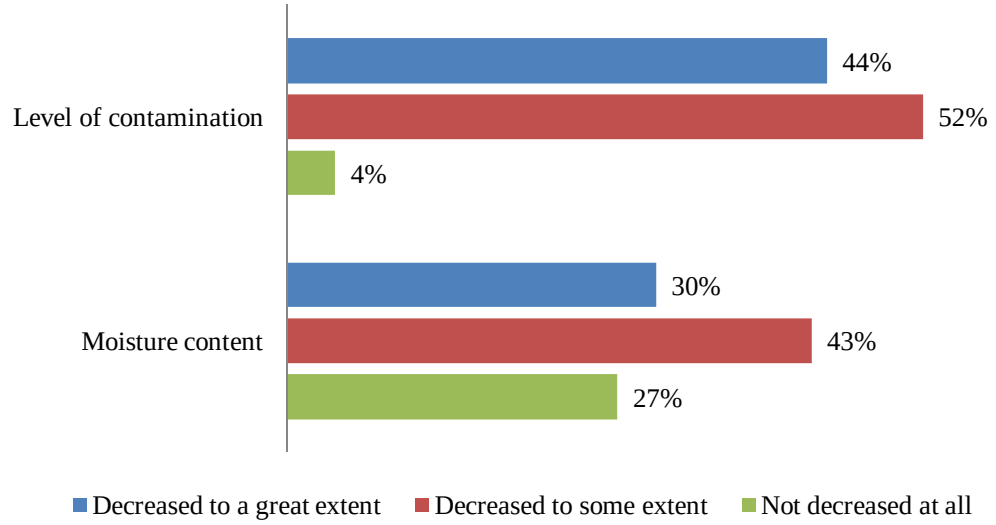
Improvement in Market Yards has also impacted the type of contamination found in cotton. The contamination in terms of soil and dust has greatly reduced. Moreover, the possibility of cotton getting mixed with other commodities and foreign material has also reduced. Further, separate parking place has reduced the contamination from vehicular pollution.

Though contamination that was added at the Market Yard level before the modernisation has decreased, cotton continues to suffer from farm level contamination. Majority of farmers store cotton at their residence before bringing the cotton to Market Yards; lack of precautions during storage at the farm level result in high levels of contamination in the form of human hair, animal waste and other foreign materials. Further, majority of farmers continue to use polypropylene bags (old fertiliser bags) and jute bags for transporting cotton to Market Yards which, results in severe contamination.

**Colour and moisture content**

Survey findings reveal that Market Yard infrastructure has not contributed to improvement in colour of cotton as well as improvement in moisture content in cotton since cotton is not stored in the Market Yards for long duration. However, these factors are adversely impacted at the farm level owing to prolonged storage of cotton at the farmer's residence. Further, the malpractices followed by farmers with regards spraying salt and water on cotton with the objective to increase the weight of cotton also affect the colour and moisture content.

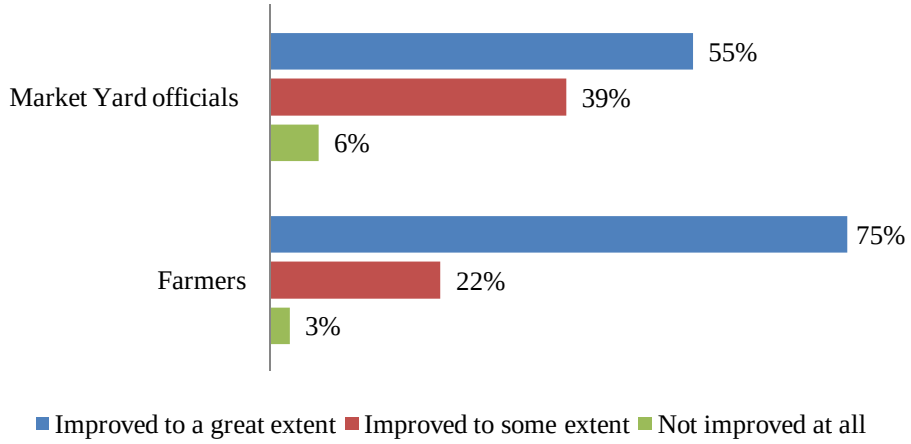
**Exhibit 6: Impact of upgradation/improvement in Market Yards as per Market Yard officials on contamination and moisture content**




*Source: Primary survey*

Owing to improvement in contamination, the overall cotton quality has improved post the modernisation of the Market Yards, as evident from Exhibit 7.

**Exhibit 7: Level of overall quality improvement in cotton as per Market Yard officials and farmers**




*Source: Primary survey*

Around 55% of the market committee officials have seen improvement in quality to a great extent and about 39% of them have witnessed the improvement in quality to some extent. Among the farmers, 75% have agreed that overall cotton quality has improved to a great extent.

### 4.2.1.2. Transparency at Market Yards

IMaCS evaluated the process of auction/tender, weighment and grading of kapas to ascertain the transparency levels at the Market Yard.

**Auction process**

All the surveyed Market Yards have confirmed that they follow open auction system. Modernisation of Market Yards under MM-III has resulted in increase in the number of farmers and traders coming to the Market Yards. The increased participation from farmers and traders has helped in reducing the information asymmetry within the system and benefitted the farmers to get better price for their cotton produce.

**Auction process in TMC Market Yard (Selu, Maharashtra)**

**Weighment process**

Improvement in weighment process because of installation of electronic weigh bridges has increased the transparency to a great extent in most of the Market Yards. Farmers are more comfortable with electronic weighing machines as they are assured that electronic system is not easy to fiddle with and will always display the accurate weight.

As seen in Exhibit 8, over 55% of the officials in the Market Yards covered during the primary survey have acknowledged that weighment process has improved to a great extent and has benefitted all the stakeholders. Furthermore, as seen in Exhibit 9 around 70% of the surveyed farmers have agreed that weighment process has improved to a great extent, which has benefitted them in getting the right weight and price for their cotton.

**Weighbridge at TMC Market Yard (Wardha, Maharashtra)**

However, there are instances when farmers directly sell their produce to cotton traders and G & P units owing to increased demand for cotton or remoteness to Market Yards. In such cases weighment is done at the G & P units.

## Grading process

The process of instrumental grading of kapas through labs has seen limited improvement owing to factors like paucity of time with farmers and traders, non-availability of skilled manpower to conduct the tests, equipment breakdown and maintenance issues and poor awareness among farmers about the benefits of instrumental grading[2].

All the Market Yards covered during the primary survey reported that grading of cotton before the auction is being done visually. Instrumental grading is carried out only in few cases of disputes between farmers and traders regarding the quality of kapas. Around 49% of the market committee officials agreed that the grading process has not improved at all; around 40% of the farmers also shared the same opinion as seen in Exhibit 8 and Exhibit 9.

Instrumental grading process offers significant potential to increase the transparency at the Market Yards, however, diligent execution at the ground level is required for widespread adoption of this system.

**Exhibit 8: Improvement in weighment and grading process as per Market Yard officials**

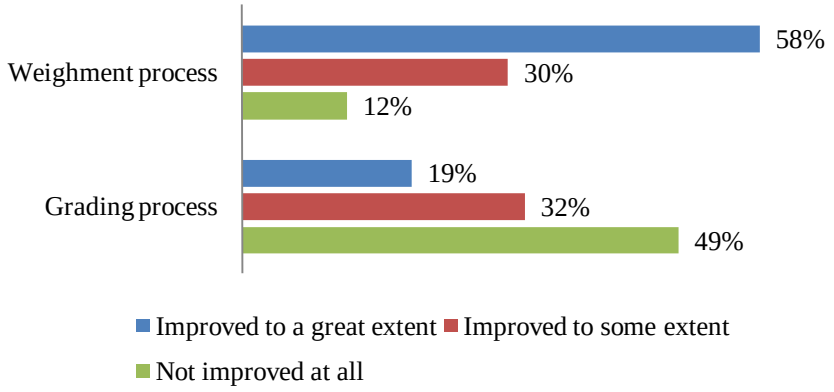
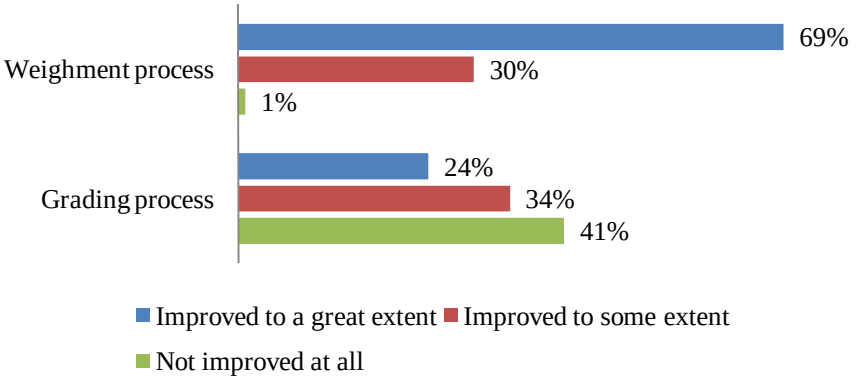



**Exhibit 9: Improvement in weighment and grading process as per farmers**




*Source: Primary survey*

[2] Refer Section 4.2.1.5 for details

### 4.2.1.3. Farmer awareness

Partial improvement has been seen with regards farmer awareness about cotton quality and best crop management practices. Majority of the farmers are aware of Bt. Cotton and its advantages owing to continuous training imparted by private seed companies, however, they have limited awareness about good harvesting, storage and transportation practices. The farmers also lack the understanding of the value of good quality cotton as some sections of farmers still mix different varieties of cotton with the objective that they will get better price realisation, oblivious to the fact that the grade of mix cotton is demoted. Furthermore, farmers still continue the malpractices of spraying salt and water on cotton with the objective to increase the weight of cotton; this adversely impacts the colour and moisture content of cotton.

IMaCS believes that there is a lot of scope for education and training of farmers in the areas of best farm practices, usage of new technologies and better picking, storage and transportation practices, which can reduce the farm level contamination.

### 4.2.1.4. Utilisation of Farmer Information Centre (FICs), and its impact on farmer awareness

Farmers' Information Centre (FIC) were installed in the Market Yards as a part of MM-III with the objective to provide information on the availability and application of seeds, fertilizers, pesticides, bio-agents, farm operations, pest management, market information, etc., through equipment like kiosk, large display board, Interactive Voice Response System (IVRS) and website. Initially FIC was a part of the '*essential infrastructure*' under the Scheme, however, subsequently it was made optional.

As a part of the study, IMaCS evaluated the utilisation of FICs in the Market Yards as well as their impact on farmer awareness about key factors i.e. cotton seeds and quality, pricing information, precautions to avoid contamination, technology transfer, appropriate picking and storage methods, etc.

**Utilisation of FICs**

Utilisation of FICs has been unsatisfactory at the Market Yards covered during the primary survey. This can be attributed to various factors such as inadequate promotion of the benefits of FICs among farmers, no updating of data and information in the FICs as well as non-availability of dedicated and technically qualified manpower to maintain the FICs.

As a part of the Scheme, FICs were installed at the Market Yards by Electronics Corporation of India Limited (ECIL); the company was also responsible for


**Farmer Information Centre (FIC) at TMC Market Yard (Julana, Haryana)**

maintenance of FICs for one year period, which was later extended to two years from the date of set up of FICs. Only 15-20 out of 90 FICs set up under the Phase 2 of the Scheme are still under the contract period and are thus, operational. Rest of the FICs have completed the two years' period and now the Market Yards find it difficult to update the information related to prices, cotton arrivals and other best crop management practices. As a result, majority of them are not operational. Lack of dedicated trained staff for FIC at the Market Yards is the other reason for non-updating of information. Though training was provided to Market Yard personnel under agreement with ECIL, trained personnel who can operate the FIC independently are not available in most of the Market Yards owing to transfers and other reasons such as employee attrition.

Amid limited utilisation, the Market Yard officials shared that farmers visit the FICs mostly during the start of crop cultivation and during the time of harvesting. During the crop cultivation period, farmers usually seek information about good quality inputs - seeds and fertilisers, through kiosks. The information regarding seeds is also provided by the private companies who promote their seeds at the Market Yards. During the harvest time, farmers seek price information for nearby Market Yards through display boards.

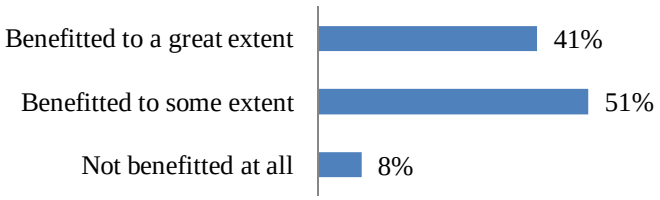
Owing to rise in usage of telecom devices in rural areas, there is an increasing trend among farmers to access price related information through mobile phones by contacting the Market Yard officials. Farmers tend to sell their produce whenever they get a high price. As a result, they prefer information exchange through mobile phones as they are able to access price information at home without incurring transportation cost and can carry their produce to the Market Yard that offers the highest price. This has further declined the utilisation of the current FIC infrastructure in recent years.

**Impact of FICs on farmer awareness**

IMaCS analysed the benefits accrued to the farmers from FICs with regards accessibility to better information, transfer of technology, pricing information, etc. In addition, we analysed the level of awareness of key factors i.e. cotton seeds and quality, pricing information, precautions to avoid contamination, technology transfer, appropriate picking and storage methods created through FICs.

According to inputs received during the primary survey, FICs have played a role in dissemination of information and creating awareness about best crop management practices, which has benefitted the farmers by reducing information asymmetry especially on quality inputs like cotton seeds, fertilizers, pesticides as well as pricing of kapas. Around 40% of the farmers confirmed that they have benefitted from FICs to a large extent and 51% confirmed that then have benefitted to some extent, as seen in Exhibit 10.

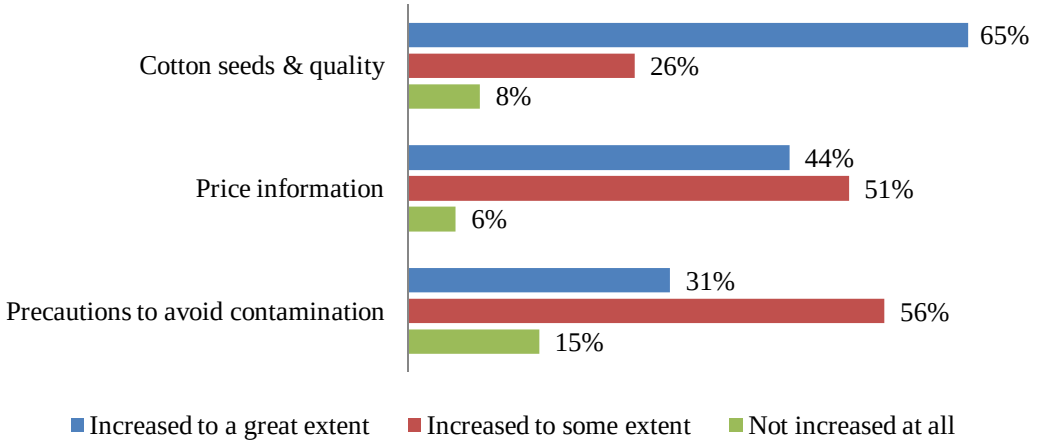
**Exhibit 10: Benefits accrued from FICs as per farmers**




*Source: Primary survey*

Farmers have mostly benefitted with regards information on seed quality and pricing. Around 65% of the farmers confirmed that FICs have helped in increasing awareness about the cotton seeds to a great extent. In addition, over 40% of the farmers acknowledged the benefit of FICs in providing pricing information to a great extent, whereas over 50% confirmed the benefit to some extent, as evident from Exhibit 11.

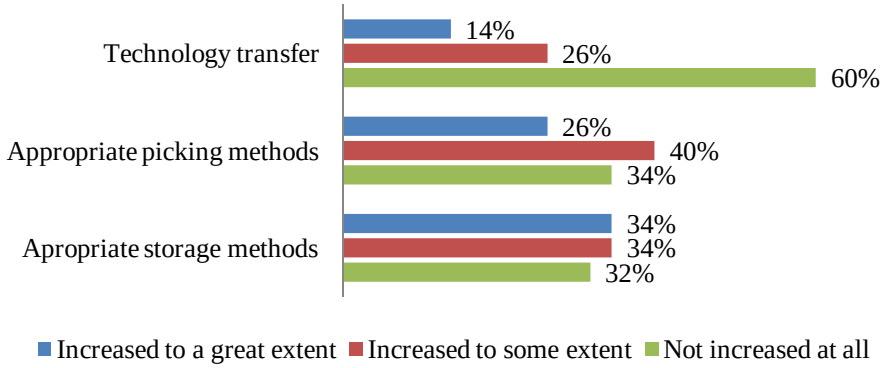
**Exhibit 11: Level of awareness created among farmers through FICs**




*Source: Primary survey*

However, benefit of FICs in creating awareness about technology transfer, best harvesting practices and storage practices has been limited. About 60% of the farmers confirmed that they got no awareness about technology transfer from the FICs. Furthermore, farmers have not been able to take advantage of FICs to increase their awareness about best harvesting, picking and storage practices, which leads to farm level contamination.

**Exhibit 12: Level of awareness created among farmers through FICs**




*Source: Primary survey*

IMaCS strongly believes that FICs can benefit the farmers by bridging the information gap, which can help farmers improve cotton productivity, improve cotton quality and get better price realisation. However, amid the changing lifestyle and preferences, FICs need innovative approach to disseminate the desired information to the farmers.

### 4.2.1.5. Utilisation of grading laboratory and its impact on farmer awareness

Grading laboratories, equipped with trash analysers, small gins and ginning percentage balances were provided in all cotton Market Yards under the MM-III with an objective to ensure correct assessment of cotton quality before the auction so that the farmers get fair price for their produce. It was also intended to reduce the malpractices by creating ground level awareness among the farmers about various quality parameters of cotton. Some large Market Yards were also provided with HVI/MVI machine for fibre quality testing, in addition to other machines.

As a part of the study, IMaCS evaluated the utilisation of the grading laboratory as well as its impact on quality related awareness among the farmers.

**Utilisation of grading laboratory**

Grading laboratories are functional in less than 30% of the surveyed Market Yards. These laboratories are used to test cotton only in few cases of disputes between farmers and traders regarding the quality of kapas, whereas grading of cotton before auction is conducted visually. Poor utilisation of laboratories can be attributed to unavailability of skilled manpower to conduct the tests, inadequate maintenance of the lab equipment as well as lack of demand for tests from the cotton traders and farmers. During cotton season, huge quantities of kapas is auctioned on each day; farmers as well as cotton traders prefer visual grading of cotton before auction owing to paucity of time to conduct instrumental grading.

**Test lab at TMC Market Yard (Akola, Maharashtra)**

Furthermore, Market Yards do not have dedicated trained staff to run the test laboratory. Though training for Market Yard personnel was conducted by CIRCOT or ATIRA, the staff has either got transferred or left and Market Yards do not have a formal mechanism for knowledge transfer to the new staff. Moreover, there is no standardisation of testing equipment across the Market Yards. As a result, various Market Yards have different type of machines and this results in difficulties in providing training to the staff. Maintenance of the lab equipment is another major concern for non-functionality of labs. There is no trained manpower to rectify/repair the equipment, which finally results in non-usage of the equipment.

IMaCS believes that instrumental grading before auction of cotton offers significant potential to increase the transparency at the Market Yards. Furthermore, grading laboratories can provide testing services to the cotton traders and nearby G & P factories, which otherwise send their samples to far locations for testing. However, owing to the issues detailed in previous section, the laboratories are not being utilised optimally. Efforts are required by both Ministry of Textiles and the APMCs to ensure optimal utilisation of the testing infrastructure created at the Market Yards.

**Impact of grading laboratory on farmer awareness**

Majority of the farmers are not fully aware about the benefits of test laboratory; the usage of test laboratory among the surveyed farmers is meagre 12% as shown in Exhibit 13. The farmers still rely on visual grading of kapas done by the traders and accept their judgement.

**Exhibit 13: Usage of grading laboratory among farmers**


*Source: Primary survey*

### 4.2.1.6. Cotton arrivals in Market Yard vis-à-vis village sale of cotton

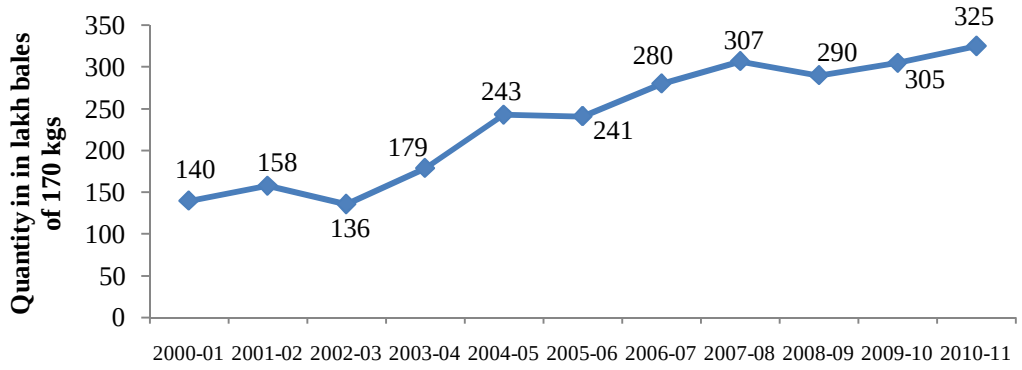
Farmers generally sell cotton at the Market Yards through open auction. In some cases, farmers sell cotton to traders/G & P units at the farm level; this sale is intimated to the APMC and the cess is paid. However, there are instances when farmers sell cotton directly to the traders/G & P units and the sale is not recorded under APMC.

As a part of the study, IMaCS analysed the kapas arrivals in Market Yards as well as the proportion of village sales (sale at the farm level) in the catchment area post the modernisation of the Yards. Trend in cotton arrivals in select TMC Market Yards is detailed in **Annexure 4**.

Cotton arrivals in majority of the Market Yards have increased over the years. This can be attributed to improvement in the Market Yard infrastructure achieved under MM-III to some extent. According to inputs received during the primary survey, farmers prefer going to TMC Market Yard because of better facilities and transparency in pricing. Furthermore, Market Yards attract large number of traders, which results in fair pricing. The availability of better infrastructure like pucca roads, platforms and parking place also draws farmers to TMC Market Yards, resulting in increased arrivals of cotton at the Market Yards.

Cotton arrivals in Market Yards have also been positively impacted by the increase in productivity of cotton owing to the impact of Mini Mission I and II of the TMC. Production of cotton in India has more than doubled in the last 10 years, as seen in Exhibit 14, owing to improvement in seed and adoption of Bt. Cotton. Increase in production of cotton has also resulted in increase in cotton arrivals in the Market Yards.

**Exhibit 14: Production of cotton in India (lakh bales of 170 kgs)**




*Source: The Cotton Corporation of India*

Farmers who produce very less quantity of cotton and are located far from the Market Yards prefer to sell their produce to the local traders or G & P units. Most of these sales are captured by the Market Yard officials but, in few cases they don't get recorded. IMaCS tried to quantify the village sales based on the cotton production in the catchment area and the respective Market Yard cotton arrivals. According to inputs received during the primary survey, farmers sell their produce to different Market Yards and not necessarily to the Market Yard in their catchment area. Therefore, it's difficult to quantify the village sales. However, as per the Market Yard officials, the trend of village sales has reduced over the years.

In certain large cotton producing regions like Gujarat and Maharashtra there is an increasing trend towards direct buying of raw cotton by G & P units and leading cotton traders and this purchase is under direct marketing licence. This procurement method has twin advantages to the buyer - firstly, buyers avoid contamination that happens at the farm level because of prolonged and improper storage of cotton by the farmers, and secondly, buyers have control over adulteration (mixing of various varieties of cotton) as they can verify the quality of the cotton at the farm level itself and discourage the farmers who may mix various varieties of cotton.

#### 4.2.1.7. Availability of good quality, contamination-free cotton for the Textile industry

Indian Textile industry has acknowledged the role played by MM-III in the improvement in cotton quality in terms of reduced contamination. According to the primary survey and stakeholder meetings with various Industry Associations and leading Textile mills, improvement in Market Yards in terms of physical infrastructure has helped to a great extent in arresting the contamination of cotton that was introduced at the Market Yard level. However, the Industry is of the view that there is still enormous scope for further improvement in terms of reducing contamination and improving other quality parameters of cotton as the contamination that happens at the farm level is still persistent and is a major quality issue. Moreover, the malpractices related to adulteration, adding salt and water to cotton further impair the quality of the fibre. Further improvement in cotton quality can be achieved through creating awareness among the farmers and providing adequate training to them about best crop management and harvesting practices.

Further, Industry personnel confirmed that installation of FICs and grading laboratories have played limited role in enhancing the quality related awareness among the farmers. There is a need for radical approach towards improving quality awareness at the farm level. To achieve these goals, Market Yards should act as facilitators and extend all the support in building awareness and improving the capability of the farmers. There is need to develop better mechanisms to impart training and knowledge to the farmers to ensure that improvement in cotton quality is sustainable.

### 4.2.2. Appropriateness of the Scheme

#### 4.2.2.1. Appropriateness of the components of the Scheme

Over 85% of the Market Yard officials confirmed that the components of the Scheme are appropriate and it has helped the Market Yards to provide better services to the farmers.

According to inputs received during the primary survey, all the essential infrastructure components like pucca roads, pucca platforms, weigh bridge, parking place, are appropriate to reduce the contamination of cotton. Benefit of this infrastructure is extended to other food commodities also as improved infrastructure facilities draw more farmers and traders to the Market Yard. However, majority of the Markey Yard officials confirmed that FICs and grading laboratories are not being utilised appropriately; these facilities need to be operationalised to ensure that the farmers are benefitted.

**Pucca roads and pucca platforms at TMC Market Yard (Wardha, Maharashtra)**

The components built under essential amenities have also helped in meeting the basic needs of farmers like food, restroom and drinking water. These facilities indirectly impact the satisfaction level of farmers and provide basic hygiene aspects to the Market Yards. These components do impact the farmer's willingness to come to particular Market Yard. Moreover, the components under optional infrastructure and other components are found to be appropriate as they are necessary to ensure that the Market Yard operates in professional and transparent manner and the farmers are benefitted.

**Drinking water facility at TMC Market Yard (Akola, Maharashtra)**

As a part of the study, IMaCS also analysed the benefits accrued to the farmers from the various components of the Scheme. Among the components of essential infrastructure, pucca roads, pucca platform and parking place has benefited in restricting the contamination to a great extent, as seen in Exhibit 15. Over 70% of the surveyed farmers confirmed that pucca roads has benefited to a great extent in reducing contamination.

The components under essential amenities i.e. availability of rest house, drinking water and canteen has also benefited the farmers, as seen in Exhibit 16. Amid optional infrastructure and other components, the sheds and warehouse facilities have contributed by restricting the contamination from foreign commodities and the boundary wall has helped by restricting the entry of animals, which add to the contamination in the Market Yards.

**Exhibit 15: Benefits accrued to the farmers from essential infrastructure components**

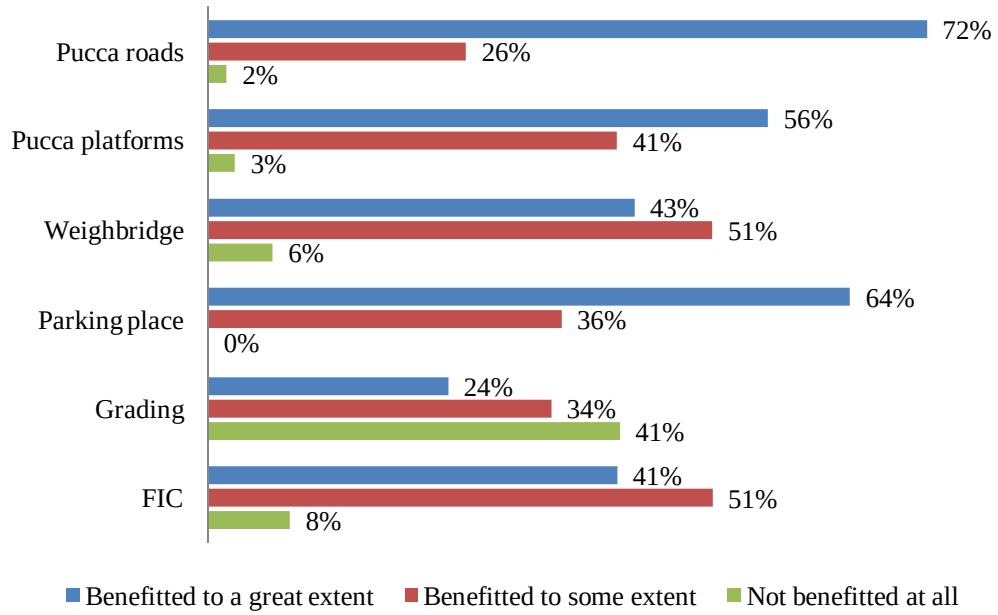
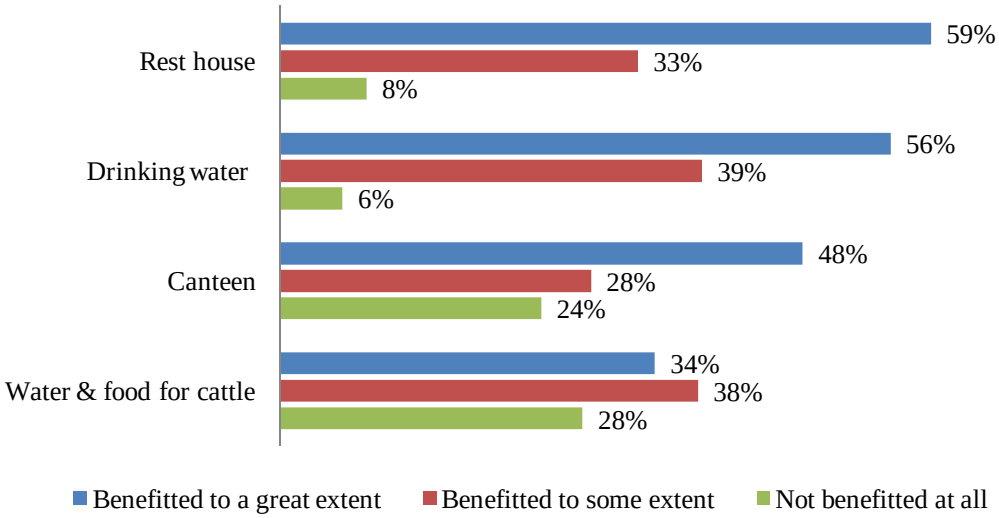
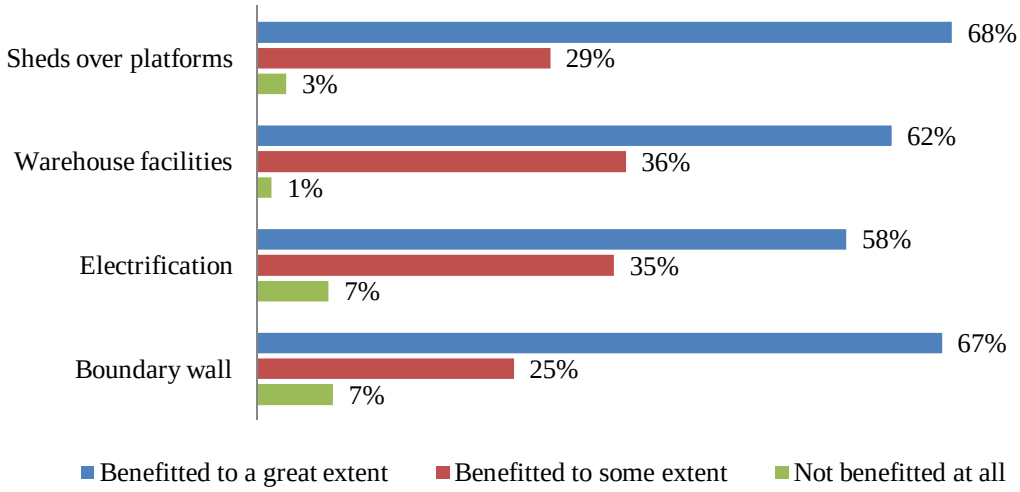



**Exhibit 16: Benefits accrued to the farmers from essential amenities**




*Source: Primary survey*

**Exhibit 17: Benefits accrued to the farmers from optional infrastructure and other components**




*Source: Primary survey*

#### 4.2.2.2. Appropriateness of financial assistance given under the Scheme

IMaCS analysed the financial assistance provided to the Market Yards under the Scheme from two perspectives - quantum of financial assistance and the mechanism of financial assistance.

The quantum of financial assistance provided under MM-III was found to be adequate as per Market Yards officials, though certain Market Yards have made large amount of investments from their own side. With reference to mechanism of financial assistance, the Market Yard officials were content with the process of approvals and reimbursement.

#### 4.2.2.3. Appropriateness of Scheme in light of adoption of mechanical harvesting

Mechanical harvester is a machine that automates cotton harvesting in a way that reduces harvest time and maximizes efficiency. Mechanical harvesting is popular in the US and Australia owing to unavailability of cheap farm labour. Mechanical harvesters require uniform plants and rows, larger fields and technical expertise. They usually leave 5% to 20% of the cotton un-harvested and require special chemical for ball openers and defoliants to reduce leaf trash from the process[3].

Mechanical harvesting is being explored in the Indian context since last few years owing to shortage of farm labour. In light of the measures being taken to adopt mechanical harvesting in India, IMaCS analysed the appropriateness of the Scheme for mechanically harvested cotton.

[3] Source: "Technology Advancement that Improve Fiber Quality" by Kater Hake, International Cotton Advisory Committee.

Majority of the Market Yard officials covered during the primary survey were not fully aware of the implications of mechanical harvesting for the Market Yards. In case of mechanically harvested cotton, the Market Yards need to be equipped with large area to handle large volume of cotton as mechanical harvesting requires only one picking as against manual picking, which requires picking of cotton for three to four times.

In case mechanical harvesting is adopted in India, MM-III should support development of large Market Yards with sufficient area to store large volume of cotton. Furthermore, support should be extended to the existing TMC Market Yards in the catchment area to increase the capacity of the infrastructure already created under the MM-III i.e. pucca platforms, sheds and warehouse facility.

### 4.2.3. Need for continuation of the Scheme

MM-III of TMC has resulted in multiple benefits for the Cotton industry. TMC Market Yards are able to attract large number of farmers and traders because of improved facilities and increased transparency in transactions, which has resulted in increased earnings for the Yards. Owing to increased participation by traders in the auction, farmers are able to get fair price for their produce and this has motivated the farmers to come to Market Yards for selling their cotton produce. Moreover, the Textile industry has benefited from reduction in contamination levels at the Market Yards. Further, MM-III has been partially successful in increasing awareness about quality as well as best harvesting practices among the farmers.

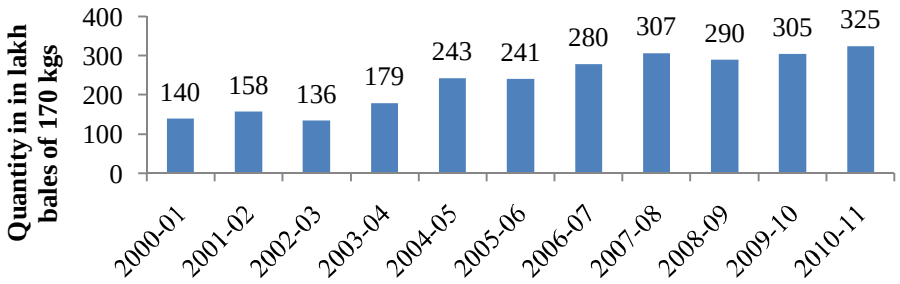
With the Scheme being concluded in December 2010, there is a need to evaluate the requirement for continuation of this Scheme going forward in light of the changing dynamics of the Cotton industry. IMaCS has analysed the need for continuation of MM-III from the following perspectives:

- Sufficiency of the infrastructure created so far
- Inclusive benefit under the Scheme
- Change in market dynamics

**Sufficiency of the infrastructure created so far**

MM-III had a target of modernising 250 Market Yards and it has successfully developed/modernised 246 Market Yards. The target was set against the level of cotton production of approximately 170 lakh bales. Owing to effective implementation of programmes under MM-I and MM-II as well as farmers' willingness to adopt Bt. Cotton, cotton production in the country has increased over the years to reach 325 lakh bales in 2010-11, as detailed in Exhibit 18.

**Exhibit 18: Cotton production in India**




*Source: The Cotton Corporation of India*

Considering the issues pertaining to food security and land pressures, the area under cotton production is likely to be largely constant at the current level. Thus, the future production is expected to be driven by improvement in cotton yield. In the case of MM-I and MM-II likely to be continued in any form, the cotton productivity is likely to improve further, going forward; the draft National Fibre Policy has assumed that yield of cotton will grow at a rate 4.7% over the next 10 years resulting in cotton production to reach 483 lakh bales by 2019-20, as detailed in Exhibit 19.

**Exhibit 19: Projections for cotton production and consumption (in lakh bales)**

| Year | Production | Consumption |
|---|---|---|
| **2014-15** | 384 | 323 |
| **2019-20** | 483 | 413 |

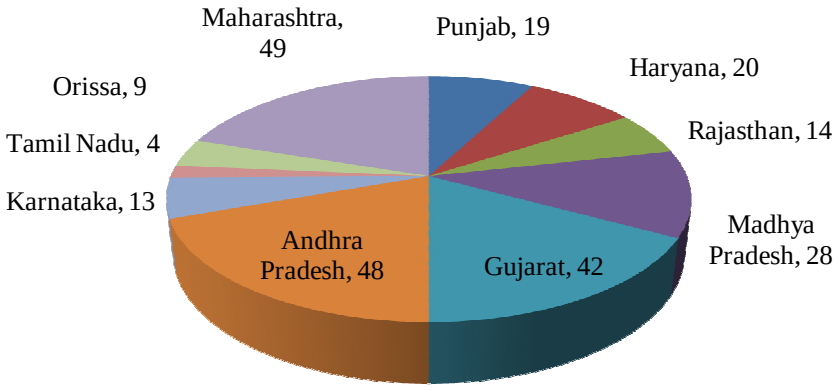
*Source: Draft National Fibre Policy, 2010-11(Scenario II)*

IMaCS is of the view that the current area and infrastructure developed under MM-III may not be adequate to cater to the projected increase in the volume of cotton.

## Inclusive benefit under the Scheme

During the period from 2000 to 2010, 246 Market Yards have been modernised under MM-III as against the total of approximate 477 cotton Market Yards operating in the country[4]. Maharashtra, Andhra Pradesh and Gujarat have been the front runners in availing the scheme, with development/modernisation of 49, 48 and 42 Market Yards, respectively, as seen in Exhibit 20.

**Exhibit 20: State-wise number of Market Yards developed/modernised under MM-III**

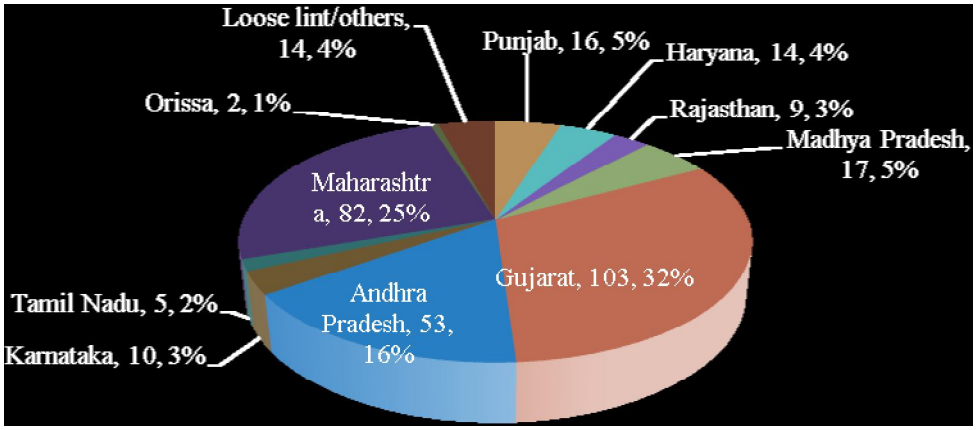



*Source: TMC*

All the three states are the leading producers of cotton, with Gujarat having a share of 33%, Maharashtra having a share of 26% and Andhra Pradesh having a share of 17% in the country's cotton production, as seen in Exhibit 21.

[4] Source: State Agricultural Marketing Boards of respective states

**Exhibit 21: State-wise cotton production in lakh bales and share of various states in cotton production (2010-11)**




*Source: The Cotton Corporation of India*

With regards state-wise penetration of the Scheme, both the Northern and Central cotton growing regions have well adopted the scheme. The penetration in the Northern region especially in States of Haryana and Rajasthan is more than 70%. Among the Central region, Maharashtra has been the forerunner in terms of penetration and has modernised over 75% of the total cotton Market Yards. Among the Southern states, only Andhra Pradesh Market Yards have well received the Scheme, with around 77% of the total cotton Market Yards modernised under the Scheme.

However, some of the key cotton growing states such as Punjab and Gujarat have modernised around 50% of the cotton Market Yards. Moreover, penetration of the Scheme in the states of Karnataka and Tamil Nadu has been significantly low at 18% and 6%, respectively. IMaCS believes that measures are required to ensure modernisation of Market Yards in the cotton producing states where the penetration of the Scheme is low.

**Exhibit 22: Penetration of the Scheme in the Market Yards of major cotton producing states**

| State | TMC Market Yards | Estimated number of cotton Market Yards* | Percentage of cotton Market Yards under TMC |
|---|---|---|---|
| **Punjab** | 19 | 35 | 54% |
| **Haryana** | 20 | 28 | 71% |
| **Rajasthan** | 14 | 17 | 82% |
| **Madhya Pradesh** | 28 | 37 | 76% |
| **Gujarat** | 42 | 79 | 53% |
| **Maharashtra** | 49 | 64 | 77% |
| **Andhra Pradesh** | 48 | 62 | 77% |
| **Karnataka** | 13 | 71 | 18% |
| **Tamil Nadu** | 4 | 64 | 6% |
| **Orissa** | 9 | 20 | 45% |
| **Total** | **246** | **477** | 52% |

**Source: State Agricultural Marketing Boards of respective states*

### Change in market dynamics

In the current economic scenario, there has been an increasing convergence on the need for reforms in agricultural marketing as pervasive regulations have resulted in increased marketing costs. As a result, efforts are being made to bring reforms in agricultural marketing practices across the country in order to enable farmers to get better prices for their produce.

The Central Government has formulated and circulated a Model Act on the State Agriculture Produce Marketing, which promotes public-private partnership in management and development of agricultural markets as well as permits the farmers, local authorities and others to establish new markets, set up purchase centers, farmer/consumer markets for direct sale in any area. Furthermore Government of India's National Agricultural Policy 2000 envisages promoting private sector participation through contract farming and land leasing arrangements to allow accelerated technology transfer, capital in-flow and assured market for crop production, especially of bio oil seeds, cotton, and horticultural crops[5]. Some of the State Governments have already amended their APMC Act and made a provision for introduction of direct marketing as evident from Exhibit 23.

**Exhibit 23: Progress of reforms in agricultural markets (APMC Act) as on 31.03.2009**

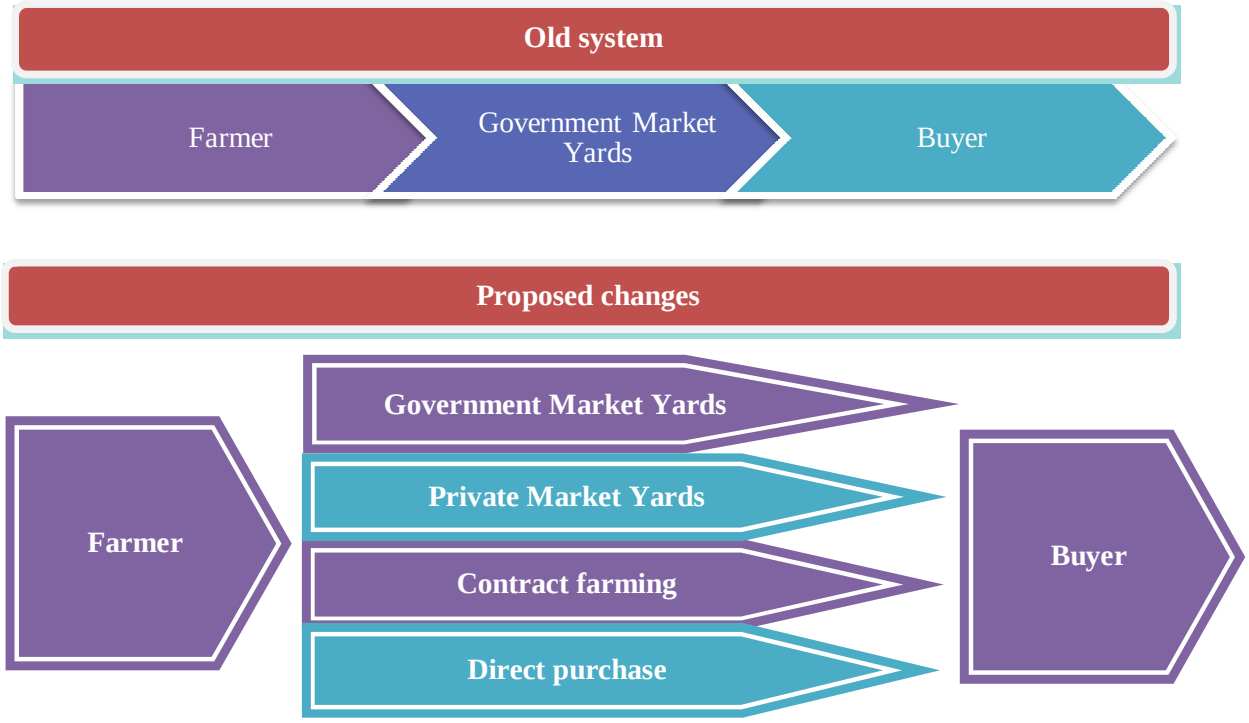
| Progress of Reforms | States/Union Territories |
|---|---|
| **States/UTs where reforms to APMC Act have been done for direct marketing; contract farming and markets in private/cooperative sectors** | Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Rajasthan, Sikkim and Tripura |
| **States/UTs where reforms to APMC Act have been done partially** | a) Direct marketing : NCT of Delhi<br>b) Contract farming: Haryana, Punjab and Chandigarh<br>c) Private markets: Punjab and Chandigarh |
| **States/UTs where there is no APMC Act and hence not requiring reforms** | Bihar, Kerala, Manipur, Andaman & Nicobar Islands, Dadra & Nagar Haveli, Daman & Diu & Lakshadweep |
| **States/UTs where APMC Act already provides for reforms** | Tamil Nadu |
| **States/UTs where administrative action is initiated for reforms** | Mizoram, Meghalaya, Haryana, J&K, Uttarakhand, West Bengal, Pudduchery, NCT of Delhi and Uttar Pradesh |

*Source: www. agricoop.nic.in*

[5] Source: http://www.nabard.org/farm_sector/contract_farm.asp

With the new APMC reforms in place, the agriculture marketing system is expected to undergo change as detailed in Exhibit 24.

**Exhibit 24: Proposed changes in agriculture marketing**




Maharashtra State Government has already issued 72 direct marketing licenses and given approvals for 7 private Market Yards[6]; private Market Yards have started operating in Dharangaon, Chopda, Shendurani and about to start in Jalgaon. The cess charged by these Market Yards is almost one-fourth of that charged by Government Market Yards[7]. Further, NABARD in collaboration with National Institute of Agricultural Marketing has a scheme for development of agriculture marketing infrastructure, which includes development of private Market Yards. Under the scheme, private entrepreneurs are entitled to 25% of the cost of the unit as subsidy with an upper limit of Rs. 50 lakh[8].

Considering the recent trends in agriculture marketing it is expected that the number of private Market Yards will increase going forward. Competitive service charges offered by the private Market Yards may result in preference for these Yards over Government Yards, unless the latter offer competitive advantage to the farmers and traders in terms of low transaction cost, better transaction facilities, improved storage and infrastructure facilities.

In addition, contract farming is also becoming an increasingly important part of agribusiness, in which the produce is purchased from farmers by multinationals or by smaller companies under bipartite agreements made between the farmer and the company, and the latter contributes directly to the management of the

[6] Source: Rashtriya Krishi Vikas Yojana
[7] Source: Primary survey
[8] Source: NABARD

farm through input supply as well as technical guidance and also markets the produce. The Model Act on the State Agriculture Produce Marketing has introduced a new chapter on contract farming that exempts produce covered by contract farming agreements from levy of market fee as well as provides for indemnity to producers' title/possession over his land from any claim arising out of the agreement, among others. Provision has also been made for direct sale of farm produce to contract farming sponsor from farmers' field without the necessity of routing it through notified markets.

Under these circumstances, cotton marketing from farm to buyer will be routed through various channels other than the Government Market Yards. Thus, IMaCS believes that any further financial support for Government Market Yards needs to be comprehensively examined.

## 4.3. Recommendations

Upgradation/improvement in the Market Yards with regards infrastructure such as pucca roads, pucca platforms, covered sheds for storage of kapas, parking space for carts/vehicles, boundary wall, etc., has arrested the level of contamination added at the Market Yards to a great extent. Better facilities at the Market Yards attract larger number of farmers and traders to the Market Yards, resulting in increased participation in the auction of cotton and thus, fair price realization to the farmers. In addition, availability of weigh bridges ensures transparency in the sale as the farmers can check the accurate weight of their produce rather than relying on the factories/traders. Owing to these benefits offered by modernized Market Yards, cotton arrivals in Market Yards have increased over the years, thus, resulting in increased earnings for the modernized Yards as against the conventional Yards. Furthermore, the G & P industry as well as the Textile industry has also benefited to certain extent from the reduced contamination level in the cotton.

In addition to development of infrastructure to reduce cotton contamination, MM-III also catalysed the development of essential amenities such as rest house, canteen and drinking water for farmers and water and fodder for their cattle. These facilities have positively impacted the satisfaction level of farmers and provide basic hygiene aspects to the Market Yards.

Though, MM-III was successful in arresting contamination at the Yard level as well as providing better working environment to the farmers, the Scheme achieved sub-optimal success with regards FICs and grading laboratories. As a part of the Scheme, attempt was made to enhance farmer awareness about the best harvesting practices through setting up FICs in the Market Yards. However, majority of the Market Yards could not realize full potential of the FICs. Likewise, efforts were also made to introduce instrumental grading of kapas as well as improve farmer awareness about cotton quality through setting up grading laboratory in the Market Yards. However, none of the Market Yards reported instrumental grading before auction. Moreover, laboratories in less than 30% of the surveyed Market Yards were found operational. Considering the potential of FICs and grading laboratories with regards benefits to the farmers, these facilities need renewed focus and innovative approach for widespread usage. The respective State Government may amend the existing APMC Act whereby the agriculture produce (in this scenario-kapas) are segregated as per the fibre quality norms and moisture content; so that farmers and buyers have the freedom to sell and buy as they wish at the price they think best.

As of December 2010, MM-III has modernized 246 Market Yards out of the total of over 470 cotton Market Yards existing in the 10 states under consideration. Moreover, Market Yards in some states such as Tamil Nadu, Karnataka and Orissa have less than 50% penetration of the Scheme. This indicates that cotton in several Market Yards is subject to sub-optimal conditions leading to increased contamination.

Furthermore, the target of 250 Market Yards under MM-III was set against the level of cotton production of approximately 170 lakh bales. However, cotton production has increased over the years to 325 lakh bales in 2010-11, and is estimated to increase to 483 lakh bales by 2019-20. In case the additional cotton produce is not provided adequate marketing infrastructure, it will lead to significant contamination of cotton thus, impairing the cotton quality. This demands continued focus on adequate marketing of cotton.

Agricultural marketing practices are undergoing significant change in the country. With the new Model Act proposed by the Central Government, marketing of agriculture produce including cotton is likely to have more options other than Government Market Yards, such as private Market Yards, contract farming, and direct purchase, as detailed in Section 4.2.3. Some of the states have already implemented agriculture reforms for instance, Maharashtra State Government has already issued 72 direct marketing licenses and given approvals for 7 private Market Yards; private Market Yards have started operating in Dharangaon, Chopda, Shendurani and about to start in Jalgaon. In addition, Maharashtra has farmer-consumer markets at 33 locations and one lakh hectare of land in the State is under contract farming under various crops[9]. These agriculture marketing reforms are likely to reduce the dependence on Government Market Yards going forward.

Under these circumstances, modernization of additional Market Yards would be required to ensure adequate marketing infrastructure for cotton. Furthermore, strategic initiatives need to be taken to ensure optimal utilization of FICs and grading laboratories set up at the Market Yards. Efforts are also required to upgrade the level of awareness among the farmers with regards importance of good cotton quality and best harvesting practices. However, any further financial assistance for Government Market Yards needs to be comprehensively examined in light of the evolving agricultural marketing practices. **Thus, MM-III should be continued in the next plan period, with modifications in the Scheme as detailed in the following sections[10].**

### 4.3.1. Modification in the eligibility criteria for awarding financial assistance for upgradation/setting up of Market Yards

MM-III has modernized around 50% of the Market Yards in the 10 states under consideration. Going forward, some of the existing Market Yards may need to be modernized. Moreover, considering the shifting pattern of crops, additional Market Yards may need to be established in areas where cotton production as of now is not enough to justify the modernization of Market Yards as per the TMC norms. However, considering the changing agriculture marketing practices that offer alternative routes such as contract farming, private Market Yards, farmer-consumer markets, direct purchase, etc., creation of additional infrastructure needs to be examined thoroughly to avoid redundancy. This demands a modification in the norms and mechanism of MM-III.

The original eligibility criteria for Market Yards to be developed under MM-III demand that there should be an annual minimum arrival or production of 75,000 quintals of cotton in the catchment area for setting up of new market yard/improvement of existing market. In the changing scenario, this eligibility criteria needs to made stricter to ensure that the additional infrastructure created under MM-III is optimally utilized. The investigative approach can consider the following aspects, among others:

- Cotton arrival in the Market Yards as well as cotton production in catchment area since, the farmers are free to sell their produce in any Market Yard or through other channels
- Expected cotton arrival going forward owing to shifting crop patterns
- Proximity to other existing Government and private Market Yards as well as upcoming private Yards

[9] Source: Rashtriya Krishi Vikas Yojana
[10] This is subject to amendment in the APMC Act

- Other agriculture marketing practices prevalent for cotton crop in the catchment area such as contract farming, farmer-consumer markets, direct purchase, etc.

In case mechanical harvesting is adopted in India, MM-III should support development of large Market Yards with sufficient area to store large volume of cotton. Furthermore, support should be extended to the existing TMC Market Yards in the catchment area to increase the capacity of the infrastructure already created under the MM-III i.e. pucca platforms, sheds and warehouse facility.

### 4.3.2. Conducting regular awareness programmes for farmers

One of the important facets of MM-III was awareness creation among farmers regarding the best practices of picking, storage, packing and transportation of cotton, with the objectives to reduce trash content by adequate precautions at the time of picking, avoid malpractices such as adding salt and water to cotton and reduce contamination by adequate precautions during storage and transportation.

Survey findings reveal that awareness programs are not conducted by the APMC. As a result, the cotton quality is significantly impacted. The farmers continue to put salt and water in cotton with the objective to increase weight. Moreover, majority of farmers store cotton at their residence before bringing it to Market Yards and lack of precautions during storage result in high levels of contamination. Further, use of old, torn polypropylene and jute bags for transportation of cotton to Market Yards add to the contamination of cotton.

**Cotton produce brought by farmers at a Market Yard in South India**

As a result, though improvement in infrastructure at Market Yards has resulted in reduction in contamination that was added at the Yard, Indian cotton continues to have high incidence of contaminants such as polypropylene, jute fibre, etc. that are added before the cotton reaches the Market Yards. In 2009, five varieties of Indian cotton featured among the top ten most contaminated cottons in the International Textile Manufactures Federation (ITMF) Cotton Contamination Survey. Moreover, none of the Indian cotton varieties feature among the '*top 29 least contaminated cottons*'[11].

Mixing of cotton varieties that takes place at the farm stage is another issue impacting the Cotton Textile industry. These issues can only be addressed through awareness and training of farmers. Farmer awareness programmes should be regularly conducted by the TMC Market Yards. The training modules for these programmes should be developed considering the key issues plaguing the Cotton Textile industry; some of the issues, as raised by the G & P industry and Textile industry are listed below:

- Adequate picking of cotton
- Precautions during storage of cotton to avoid contamination
- Precautions for packing and transportation of cotton

[11] Refer Annexure 5 for summary of ITMF contamination survey reports

- Issues pertaining to malpractices such as adding salt and water to cotton and their impact on cotton quality
- Adulteration of cotton and its impact on cotton quality

As per the project under National Agricultural Innovation Project (NAIP) implemented through CIRCOT, it has been observed that good farm management practices like using of cotton bags for collecting the cotton bolls and storing of cotton during transportation from farm level to ginning level has benefitted farmers. The farmers can command a minimum premium of 5% per tonne of kapas. The good on-farm and off-farm management practices have further scope of improving realisation for G&P units and also for textile units. The do's and don'ts check list at farm and market yard level developed as part of the project is attached as **Annexure 9**. Further, fertiliser companies can be persuaded to use coloured Polypropylene instead of white Polypropylene bags so that it would be easy to detect coloured bags in the blow-room process of Spinning. In addition, farmers should be trained on cotton quality parameters and the importance of instrumental grading before auction to promote the adoption of this practice in long term. This could be achieved through the following steps:

**Link farmer awareness programmes with *Farmer's Field School (FFS)* and *Front Line Demonstrations (FLD)* of MM-II**

MM-II of TMC has two key farmer awareness programmes - **Farmer's Field School (FFS)** that provide season long training to farmers, enabling them to grow healthy crop adhering to right crop management practices, and **Front Line Demonstrations (FLD)** that disseminate new technologies developed by the scientists on crop production, pest control, efficient water use, post-harvest management and other crop management practices.

In the case of MM-I and MM-II likely to be continued, farmer awareness programmes under MM-III can be linked with FFS and FLD components of MM-II, as they share the same objectives of building the capacity at the farmers level.

**Formation of MM-III Monitoring Committee**

MM-III Monitoring Committee should be formulated at each APMC with representation of regional office of CCI, APMC officials, ginners/traders, textile mills and prospective farmers. The Monitoring Committee should evaluate the performance of APMC vis-à-vis various outlined objectives and take mid-term corrective steps. Further, the Monitoring Committee should conduct awareness programs in coordination with institutes such as CIRCOT, Cotton Ginners Training Centre, etc.

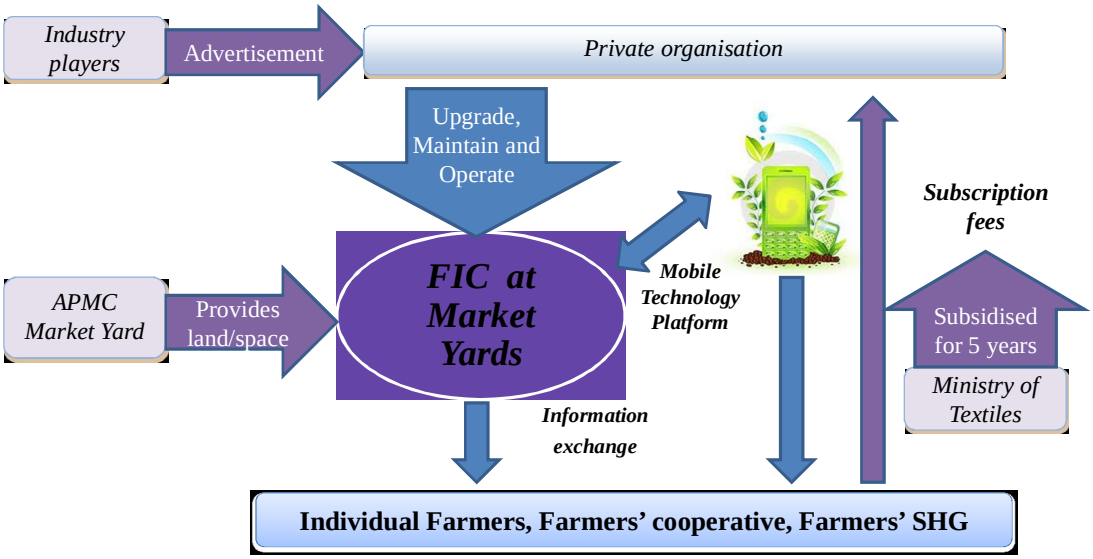
Furthermore, only farmer awareness programmes may not be sufficient to prevent all the malpractices; there is a need for certain legal framework which could act as a deterrent to the farmers from indulging in malpractice of adding water and salt intentionally in the cotton to increase the moisture content beyond 8% before the sale.

### 4.3.3. Adopting public-private partnership model to operate FICs

Farmers' Information Centre (FIC) were installed at the Market Yards as a part of MM-III with the objective to provide information on the availability and application of seeds, fertilizers, pesticides, bio-agents, farm operations, pest management, market information, etc., through equipment like kiosk, large display board, Interactive Voice Response System (IVRS) and website. However, utilisation of FICs at majority of the Market Yards covered during the primary survey has been unsatisfactory. According to inputs received during the primary survey, this can be attributed to various factors such as inadequate promotion of the benefits of FICs among farmers, no updating of data and information in the FICs as well as non-availability of dedicated and technically qualified manpower at the APMCs to maintain the FICs.

Ensuring optimum utilisation of FICs for the benefit of the farmers demands strategic interventions with regards the implementation of FIC. As a part of the study, IMaCS analysed various initiatives undertaken by private players and government agencies for information dissemination among the farmers in order to understand the key success factors so that the same can be replicated in case of FICs; the details of some of such initiatives are provided as **Annexure 7**. In order to ensure optimum utilisation of FIC, it should be operated under public-private partnership (PPP) model, as detailed in Exhibit 25.

**Exhibit 25: Proposed PPP model for Farmer Information Centre**




Private companies or NGOs who are willing to operate FICs should be identified at a regional-level, on the basis of competitive bidding. APMC should provide the land and basic infrastructure required for the FIC. The private company/NGO should develop the required software and other infrastructure required for enabling information dissemination through FIC and should charge a nominal subscription fee to the farmers to cover its cost. For the initial 5 years of implementation, the farmer subscription fee should be subsidised by the Ministry of Textiles in order to encourage farmers to avail these services.

However, a key challenge in this area is to attract private players to partner for this venture. In order to enable the venture to become self-sustainable, the private partner should be allowed to use this channel for advertisements, which will provide an additional source of revenue. Further, the scope of information

dissemination under FIC should be expanded to include agriculture credit, insurance related information, etc., so that the FIC can become a one stop shop for all information. This will enable this venture to become profitable and attract private players to partner with the Ministry of Textiles.

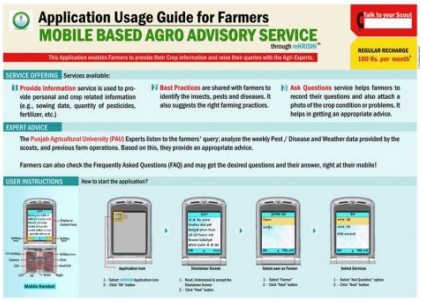
### 4.3.4. Introducing mobile platform as a part of FIC

Owing to rise in usage of telecom devices in rural areas, there is an increasing trend among farmers to access price related information through mobile phones by contacting the Market Yard officials. This has further declined the utilisation of the FIC infrastructure in the Market Yards, in recent years.

Mobile technology offers significant scope for information dissemination among the farmers. mKRISHI, a mobile Krishi platform developed by Tata Consultancy Services (TCS) is an example of such a service. TMC should include mobile platform under the FIC. Going forward, mobile platform should be the focus of FIC rather than creating infrastructure at the Market Yard level owing to increasing mobile penetration in rural areas.

**Case study: Mobile Krishi Platform from Tata Consultancy Services**

TCS has developed mKRISHI (m=mobile; krishi=agriculture) to offer personalized and integrated services to farmers. The mKRISHI platform combines multiple technologies such as cellular network, camera phone, automatic weather station, soil and crop sensor technologies to bring vital information regarding local weather, fertilizer requirement based on soil conditions, pest control, and current grain prices in local markets in a rich content format to the farmer's handset.




The mKRISHI ecosystem provides an integrated view of the farmers profile, farming history, and the required farm parameters on a console at a remote location to an expert. Farmers can also send pictures of their crops and pests, captured with mobile phone cameras; sensors provide farm specific soil and crop data, weather stations provide microclimate details and voice-based querying system gives freedom to the farmers to ask any query in their local language. After analysis of the available information, the expert's advice on the farmer's query is provided on the farmer's mobile phone.

Some of the key benefits to farmers include the following:

- Advice on pesticides/fertilizers, such as how much and when to spray
- Advice on when to harvest in relation to weather in order to limit crop damage
- Market prices made available so they can choose where and when to sell

In addition, Government can communicate new policies to farmers and can obtain information regarding farmers to develop further policies.

*Source: www.tcs.com, www.wsj.com*

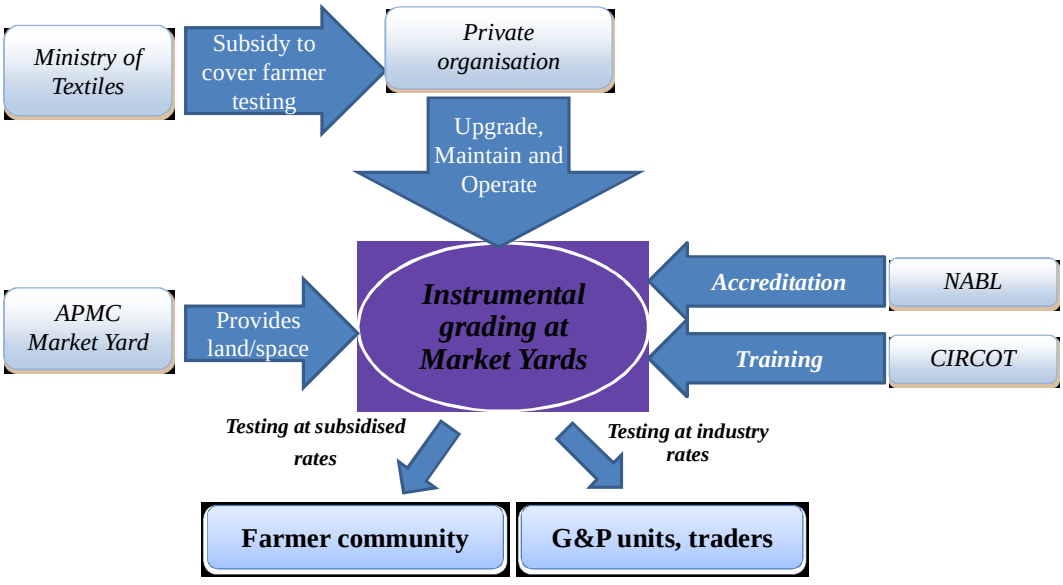
### 4.3.5. Adopting public-private partnership to operate grading laboratories

Testing laboratories were offered to the APMC, with an objective to promote instrumental grading of cotton to ensure fair price to the farmer community. Survey findings reveal that majority of the APMCs have very poor utilization of the laboratories. Among the APMCs covered during the primary survey, none of the APMCs were using test laboratory for grading of cotton before the auction; grading continues to be done visually, however, some of the APMCs utilise laboratories for settlement of disputes between the farmers and ginners/traders.

According to the Market Yard officials, instrumental grading of cotton before the auction is unmanageable during the Cotton season owing to huge quantity of cotton arrivals. The laboratory can be used for dispute settlement as well as creating awareness among the farmers. Moreover, it can be used to conduct cotton testing for the G & P factories in the catchment area. However, it is not being used appropriately owing to lack of dedicated and trained staff at the laboratory. Though select APMC officials were given training at the time of modernisation of Market Yards, the personnel have been transferred and adequate measures to train the new employee have not been taken. As a result, despite the availability of laboratory in the APMC, the G & P factories in the nearby area send their samples to CIRCOT or other renowned institutes for testing.

In order to ensure optimum utilization of testing laboratories, they should be operated under public-private partnership (PPP) model. Private companies to operate the test laboratories should be selected on the basis of competitive bidding. In addition, the basic requirements of the laboratory should be revised such that the laboratories house the latest equipment required for cotton testing including HVI. Adequate subsidy to upgrade and run the upgraded laboratories should be provided to the private companies until the laboratories become self-sustainable. Further, accreditation of these laboratories by NABL or other renowned institutions should be made mandatory so that the stakeholders have adequate faith in the test results. Exhibit 26 details a proposed PPP model for the grading laboratories.

**Exhibit 26: Proposed PPP model for the grading laboratories**



### 4.3.6. Development of storage infrastructure at the farm level

Survey findings reveal that farmers store cotton at their residence for many days before bringing the produce to Market Yards with the aim to get better price. Lack of precautions during storage at the farm level is the key reason for high level of contamination in Indian cotton. Thus, there is a need for creating godowns with better infrastructure and scientific storage at the farm level itself, which will help in reducing the farm level contamination as the farmers can store their produce at the godowns and would be able to sell their produce at market price at their wish.

Reduction in contamination through adequate farm-level storage has been demonstrated by one of the G & P factories. The company has achieved significantly lower levels of contamination in cotton. Though better management practices at the factory have helped in achieving this, the major improvement has been realised through less contamination in the purchased cotton through innovative management practices. The company realised that the major source of contamination in cotton was inadequate storage of cotton at farmer's residence that resulted in contaminants such as human hair, animal waste, food waste, etc. in cotton. In order to overcome this, the company provides storage space to farmers in the company premises. Farmers pick cotton and store in the pucca godown available at the company site. Moreover, farmers are free to sell their produce at market price whenever they want to sell. This has helped reduce contamination to a great extent.

A Scheme under NABARD and National Cooperative Development Corporation (NCDC) - *Gramin Bhandaran Yojana*, for rural godowns, focuses on creation of scientific storage capacity with allied facilities in rural areas. The Scheme aims at meeting the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs; promotion of grading, standardization and quality control of agricultural produce to improve their marketability; prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; strengthening agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in respect of agricultural commodities stored in such godowns and reversing the declining trend of investment in agriculture sector by encouraging private and cooperative sectors to invest in the creation of storage infrastructure in the country.

Under the Scheme, the project for construction of rural godowns can be taken up by individuals, farmers, group of farmers/growers, partnership/ proprietary firms, non-Government organizations (NGO's), self-help groups (SHGs), companies, corporations, co-operatives, local bodies other than Municipal Corporations, federations, agricultural produce marketing committees, marketing boards and agro-processing corporations. As a part of the Scheme, godowns have been developed mainly by farmers (70%) followed by traders, business houses and other categories. Cotton is one of the main commodities stored in these godowns mainly in the states of Maharashtra, Gujarat, Tamil Nadu and Andhra Pradesh.

Ministry of Textiles and TMC cell should liaise with NABARD and NCDC to promote development of rural godowns in cotton growing clusters. This would help to arrest the contamination of cotton at the farm level to a great extent and will enable farmers to avoid distress sale immediately after harvest by providing the facility of pledge financing and marketing credit.

***Section II***

# Evaluation of Mini Mission-IV of Technology Mission of Cotton

# 5. Evaluation of Mini Mission-IV of Technology Mission on Cotton

## 5.1. Introduction

Mini Mission (MM)-IV was launched with the objective to improve the quality of cotton through modernization and technological upgradation of existing G & P factories, as well as setting up new units so as to improve the processing of cotton. Composite units, i.e., ginning units willing to install bale press as well as pressing units intending to install ginning facility were eligible for modernization under TMC assistance; post modernisation, the unit was required to have a production capacity of 6-8 bales per hour.

Under MM-IV, TMC provided financial assistance for upgradation of G & P factories to achieve the standards of an ideal factory specified by TMC, as detailed in the following section. Financial assistance provided under MM-IV was 25% of the cost of machines and civil infrastructure subject to a ceiling of Rs. 20 lakh for large units and Rs. 15 lakh for small units. Assistance was also provided for automatic bale press and grading laboratory at the rate of 25% of the cost, with a ceiling of Rs. 7 lakh and Rs. 4 lakh, respectively.

**Components of an ideal G & P factory**

**A. Essential machines:**

1. ***Ginning machines:*** Three saw gins or 24/12 double roller gins with auto feeders.
2. ***Pre-cleaner:*** Machine to remove trash from kapas before ginning.
3. ***Lint cleaner***: Machine to remove residual trash from ginned cotton.
4. ***Kapas conveyor***: Mechanical/pneumatic conveyor system for transfer of kapas from heaps to precleaner(s) and from precleaner(s) to individual gins. **Central platform system was not permitted unless it already existed.**
5. ***Lint conveyor:*** Mechanical/pneumatic conveyor system for carrying lint from Gin House to lint cleaner and from lint cleaner to Pala Halls. Only in case of an automatic bale press, lint conveyor from Pala Halls to the press box was essential. In case the existing/new bale press was not automatic, the third stage conveyor from Pala House to press box was not compulsory.
6. ***Bale press:*** Automatic bale press was not compulsory under the MM-IV scheme. For the unit to be eligible for a special subsidy of Rs. 7 lakh for the automatic bale press, the bale press was required to have the following technical characteristics:
    i. Single stage operation
    ii. Built-in auto-tramper
    iii. Oil hydraulic system
    iv. Lint slide and pusher mechanism
    v. Press box dimensions meeting BIS requirements

Conventional bale presses without the first four features were permitted under the Scheme, however, such factories were not eligible for the special subsidy.

7. ***Seed conveyor***: Conveyor for carrying seed from gins to seed platform outside.

8. ***Humidifiers/moisturizers***: Appropriate devices to maintain standard moisture in kapas at the Gin Hall and in lint at the Pala Halls and Press Hall/Lint Slide.

9. ***Fire fighting system:*** This included overhead tank/sump, electric pump with stand-by diesel pump and hydrants with hose pipe and nozzles.

10. ***Overhead electric wires:*** These were not permitted in the functional area in the factory premises.

*11.* ***Weigh bridge:*** This was an essential item, but installation was not compulsory if the facility was available nearby.

**B. Essential infrastructure:**

1. ***Pucca platform for kapas***: Concrete platform, roofed or open, raised above ground level with a capacity to store 15 days' stock of seed cotton.

2. ***Covered storage space for lint (Pala House):*** The size of Pala Halls insisted on was such as would permit storage of one week's stock of ginned lint before it is pressed into bales.

3. ***Seed platform***: Open or roofed platform to store ginned seed ought to be elevated and with concrete surface, large enough to store at least a week's stock of seeds.

4. ***Bale storage space:*** Open or roofed concrete platform was compulsory for stocking pressed bales.

5. ***C.C. Road:*** Starting from factory gate, the CC road was required to reach up to kapas platform. Ideally it would link all buildings in the factory premises.

6. ***Boundary wall/fence:*** For security and visual elegance, a boundary wall or fencing all around the factory compound was an essential requirement.

7. ***Any other item(s) approved by TMC***: Office block, labour quarters, dust room, etc., which were considered as non-essential items, could also form part of a factory project.

**C. Essential conditions:**

1. ***Quality awareness boards to educate workers:*** Do's and Don'ts to avert cotton contamination were to be displayed in the factory premises.

2. ***Headgear/cap/uniforms for workers:*** These indirectly contributed to prevention of cotton contamination.

3. ***Training of gin fitters:*** Gin operators/technicians were required to be trained on maintenance and repair of machines so as to maximize output and ensure cotton quality.

4. ***Arrangement for disposal of rubbish***: This was an essential step towards preventing entry of impurities into kapas and lint within the premises of the ginning factory.

5. ***Gummed boards:*** Human hair and other light materials picked up from floor, cotton heaps, etc., could be stuck on such boards and, thus, prevented cotton contamination.

6. ***Segregation of cotton:*** Variety-wise and grade-wise heaping and ginning of cotton is essential for maintaining cotton quality within and between bales.

7. ***Covering of cotton:*** Kapas bought in carts, lorries, etc., was required to be covered during transport from Market Yard to ginning factory so as to prevent the entry of foreign matter on the way.

8. ***Bale packaging as per BIS specification:*** Bale size, weight, bale covering cloth, straps, labelling, etc. were to meet BIS specifications.

9. ***Gin/press fitters:*** At least two trained fitters were to be available at the factory during each shift.

**D. Desirable machines:**

1. ***HVI for cotton testing:*** A grading laboratory with HVI machine would provide cotton quality data for every bale, increasing its marketability. Installation of HVI machine rendered the factory eligible for a special subsidy of Rs.4 lakh.

2. ***Generator(s):*** A stand-by power generator would ensure uninterrupted processing of cotton in the factory.

3. ***Laboratory model gin***: This handy device would provide small lint samples for quality testing before cotton is purchased by the factory.

4. ***Ginning percentage balance:*** This machine gives information on fibre content in kapas, vital to decide the purchase price.

5. ***Moisture meter:*** This probe type device would help detect excess water if any in kapas as it arrives.

6. ***Workshop machines***: A ginnery needs a mechanical workshop for efficient machine maintenance.

7. ***Roller grooving machine***: This device will ensure that grooves on gin rollers are of required size, orientation and quality.

8. ***Pod opener/kala machine:*** Machine required to extract kapas from pods of certain varieties could be included in the project.

9. ***Any other machine subject to TMC approval:*** Miscellaneous items like electric motors, fire extinguishers and other machines required in ginneries could also be included in the factory's project.

**E. Desirable conditions:**

1. Bales to be covered with cotton cloth

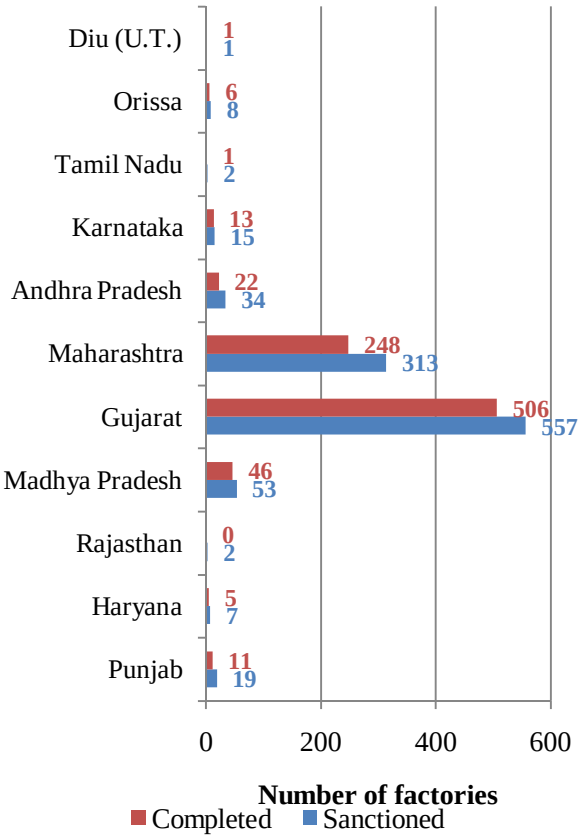
2. Press house to be close to gin house

**Performance of the scheme**

MM-IV achieved modernisation of 859 factories, accomplishing 85.9% of the set target of 1,000 factories; 885 projects reported completion but, 26 factories were found incomplete as technical features did not meet TMC requirements and, thus, were rendered ineligible for the Government grant or the ginners preferred to withdraw the proposals on their own. Exhibit 27 gives the state-wise implementation of the Scheme.

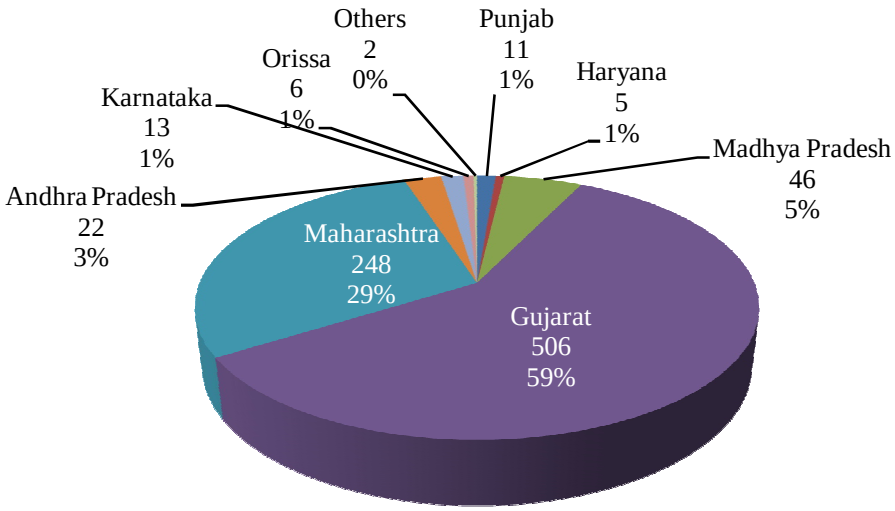
The development/modernisation under MM-IV was achieved with a financial outlay of Rs. 184.75 crore. Of the total G & P factories benefited under the scheme, Gujarat accounted for the largest share of 59% (506 G & P factories), followed by Maharashtra (29%, 248 G & P factories) and Madhya Pradesh (5%, 46 G & P factories), as seen in Exhibit 28.

**Exhibit 27: State-wise implementation of MM-IV**




*Source: TMC*

**Exhibit 28: State-wise share of G & P factories modernised under MM-IV**




*Source: TMC*

## 5.2. Assessment of impact of MM-IV

In accordance with the terms of reference, IMaCS evaluated MM-IV on the following four facets:

### 1. Benefits accrued from the Scheme

This encompassed impact of the Scheme on the following parameters:

- Quality of the cotton processed in modern G & P factories, with regards
  - Trash level and other impurities like cut seeds, etc.
  - Contamination level
  - Uniformity of quality due to removal of short fibre content, kowdy, etc. with the help of kapas cleaner, modern gins and lint cleaners
- Efficiency of packing of bales with regards improvement owing to modernized press, pucca platform for storage of bales, etc.
- Performance of modernised G & P factories, with regards
  - Cost of processing kapas into bales
  - Man power requirement
  - Production
- Price realisation
- Grading practices followed for cotton i.e. whether the G & P factory owners, who have installed HVI labs, benefited in terms of grading their cotton before sales as compared to those who are not having this facility, and succeeded in realizing better price and higher margin
- Availability of good quality, contamination-free cotton for the Textile industry

### 2. Appropriateness of the Scheme

This encompassed the following parameters:

- Appropriateness of the components of the Scheme, including,
  - Whether the selection of components of development/modernisation was appropriate/adequate for G & P factories?
  - Which of the components have contributed for quality improvement?
  - Whether any new components are required for further improvement of G & P factories?
- Appropriateness of financial assistance given under the Scheme
- Appropriateness of the Scheme in light of adoption of mechanical harvesting practices in future
- Impediments to accessing the same so as to evaluate the changes/modifications required in the Scheme to urge the ginneries that have not shown interest in modernization so far to come forward for modernization

### 3. Need for continuation of the Scheme

This encompassed assessment of the need to keep MM-IV of TMC in operation in view of likely continuation of MM-I & MM-II of TMC.

### 4. Other aspects

Appropriateness of the existing Indian Standard, cotton bales specification IS 12171:1999 of BIS i.e. whether there is a need to improve the standard.

### 5.2.1. Benefits accrued from the Scheme

#### 5.2.1.1. Quality of the cotton processed in modernised G & P factories

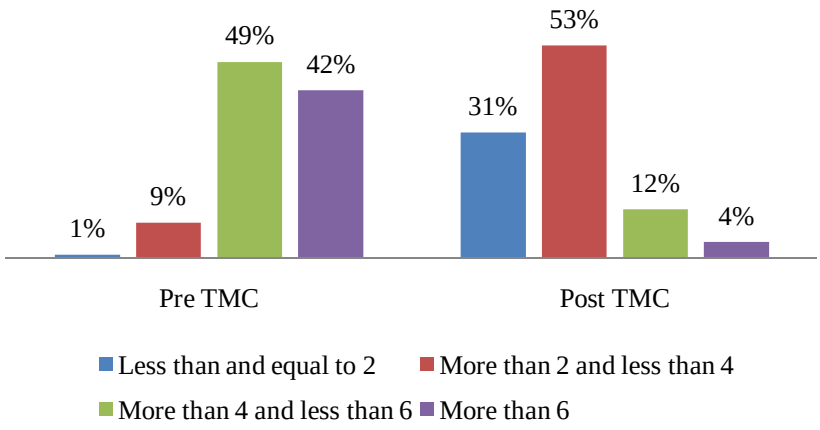
As a part of the study, IMaCS analysed the impact of modernisation of G & P factories on the key parameters of cotton quality i.e. trash content, cut seeds, kowdy, contamination level and uniformity of cotton quality due to removal of short fibre content, etc.

**New unit created under TMC at NSL Textiles (Edlapadu, Andhra Pradesh)**

**Trash content**

Modernisation of G & P factories has significantly reduced the trash content in processed cotton. Trash content has decreased from high levels of 4-8% during the pre-TMC period to 1.5-3% post modernisation. Among the modernised G & P factories covered during the primary survey, around 30% of the factories process cotton with trash content below 2% and about 53% of the factories achieve trash content between 2 and 4%, as seen in Exhibit 29. The radical improvement in the trash levels has been attributed mainly to the pre-cleaners and post-cleaners installed by modernised G & P factories under the MM-IV.

**Exhibit 29: Impact of modernisation of G & P factories on trash content**



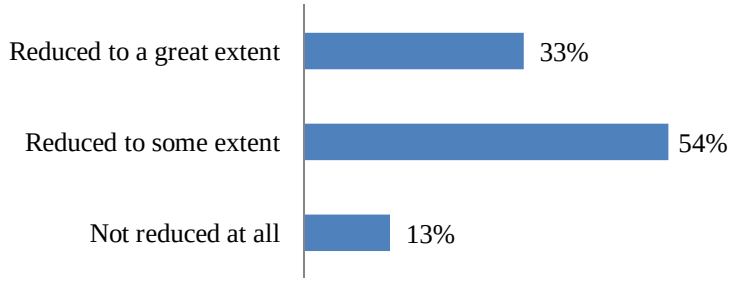

*Source: Primary survey*

**Level of contamination**

Modernisation of G & P factories as well as improved management practices in the TMC units has resulted in decrease in contamination to certain extent. Various types of contamination like pan packets, rubber pieces, machine parts, dust, animal waste, etc. were found in cotton before modernisation. Modernisation of the factories in terms of developing infrastructure such as CC roads, concrete surface for storing cotton, lint and seeds along with automation of ginning and pressing operations like conveyor systems to avoid manual interventions has resulted in reduction in contamination levels. Around 33% of

G & P units have noticed reduction in contamination to a great extent, whereas 54% have noticed that contamination has reduced to some extent, as seen in Exhibit 30.

**Exhibit 30: Improvement in level of contamination post modernisation under MM-IV**



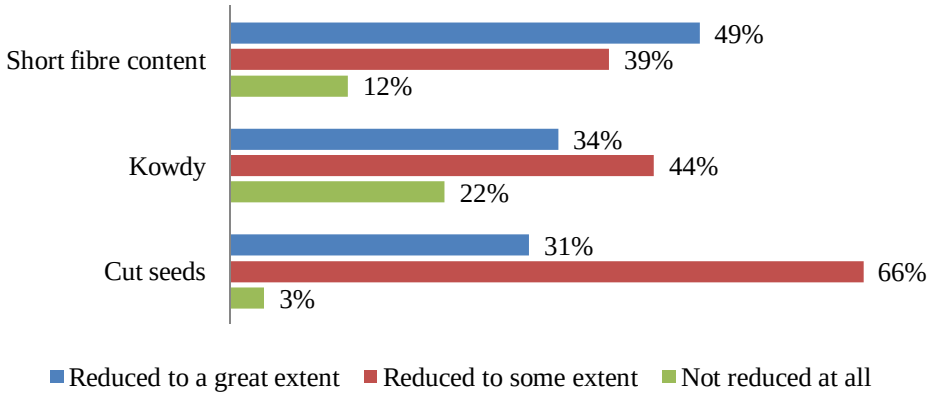

*Source: Primary survey*

However, contaminants such as human hair, strings of polypropylene, jute fibre, etc., still continue to be present in the processed cotton owing to unhealthy practices related to picking, storage and transportation of cotton from farm to Market Yards and factories.

**Uniformity in cotton quality**

Most of the modernised G & P factories have achieved better uniformity in cotton quality owing to pre-cleaners and post-cleaners that have helped in reducing short fibre content, kowdy and cut seeds in the processed cotton. Around 50% of the factory owners confirmed that short fibre content has reduced to a great extent, whereas around 40% stated that short fibre content has reduced to some extent because of the modernisation of factories. Likewise, over 75% of the factory owners confirmed an improvement in kowdy level and over 95% confirmed an improvement in the level of cut seeds post modernisation, as seen in Exhibit 31.

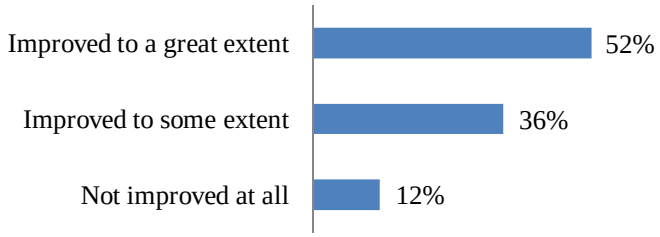
**Exhibit 31: Improvement in other cotton quality parameters post modernisation under MM-IV**




*Source: Primary survey*

Accordingly, overall quality of the cotton processed in modernised factories has improved; around 52% of factory owners acknowledged improvement in cotton quality to a great extent whereas around 36% witnessed improvement in cotton quality to some extent owing to modernisation under MM-IV.

**Exhibit 32: Overall improvement in processed cotton quality**




*Source: Primary survey*

### 5.2.1.2. Efficiency of bale packing

Under MM-IV, special subsidy of Rs. 7 lakh was provided to the G & P factories willing to install automatic bale press with technical characteristics such as single stage operation, built-in auto-tramper, oil hydraulic system, lint slide and pusher mechanism as well as press box dimensions meeting BIS requirements, with the objective of improving the efficiency of bale packing. However, conventional bale presses without the first four features were also permitted under the Scheme. In addition, covering bales with cotton cloth was also promoted.

**Cotton bales at TMC unit - Manjeet Cottons, Maharashtra**

As a part of the study, IMaCS analysed the improvement in bale packing owing to modernisation under MM-IV. According to inputs received during the primary survey, introduction of single stage press has helped to a great extent in reducing the variability in average weight of the bale and thus, attaining the standard weight of around 170 kg. However, some of the modernised units have reported a variability of around 10% in the average weight realisation.

Furthermore, majority of the surveyed G & P factories use cotton cloth for packing the bales from all sides, which helps in arresting cotton contamination during transport. However, cotton cloth used by various factories varies in strength as a result there are instances of cloth getting torn during transportation resulting in contamination of cotton. In addition, rusted iron strips used for packaging result in rust stains. Measures need to be taken to promote usage of good quality packing material to avoid cotton contamination.

### 5.2.1.3. Performance of modernised factories

As a part of the study, IMaCS analysed the impact of modernisation on key performance parameters of G & P factories i.e. manpower requirement, production and cost of processing kapas into bales.

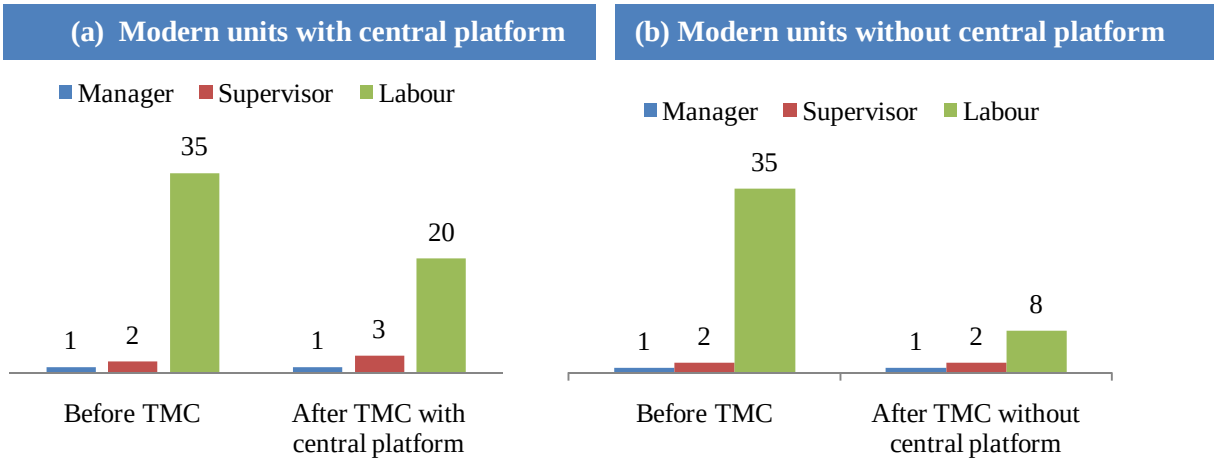
**Manpower requirement**

Modernisation has made a significant impact on the manpower requirement in both ginning and pressing operations. Automation including conveyor systems for kapas, lint and seed transfer, direct feed to gins and in some cases to the bale press has reduced the labour requirement. Furthermore, this has successfully resolved the labour issues, which were critical for increasing productivity and improving cotton quality.

**Pneumatic conveyor system at TMC G&P unit (Pashupati cotton, Maharashtra)**

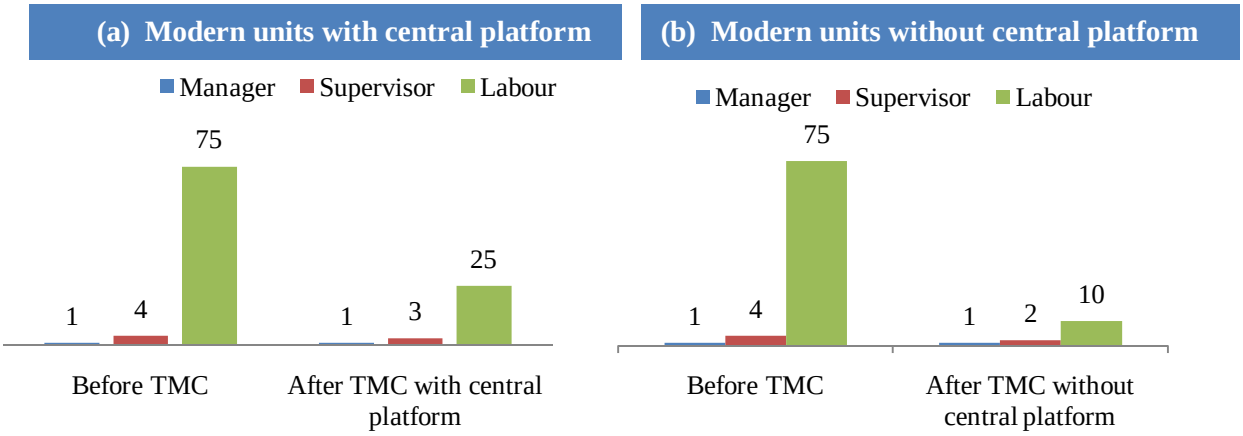
As a part of the primary survey, IMaCS analysed the manpower requirement in the G & P units pre- and post-modernisation. According to inputs received during the primary survey, automation of ginning operations including conveyor systems for kapas, lint and seed transfer, has reduced the labour requirement by around 70%. However, in case the unit continues to operate with a central platform post-modernisation, the reduction in labour requirement is estimated at around 40% on an average. Exhibit 33 and Exhibit 34 detail the change in manpower requirement for representative G & P factory with a production capacity of 100 bales per day and 300 bales per day, respectively.

**Exhibit 33: Change in manpower requirement in ginning operations owing to modernisation under MM-IV**
***Case study of a unit with a production capacity of 100 bales per day***




*Source: Primary survey*

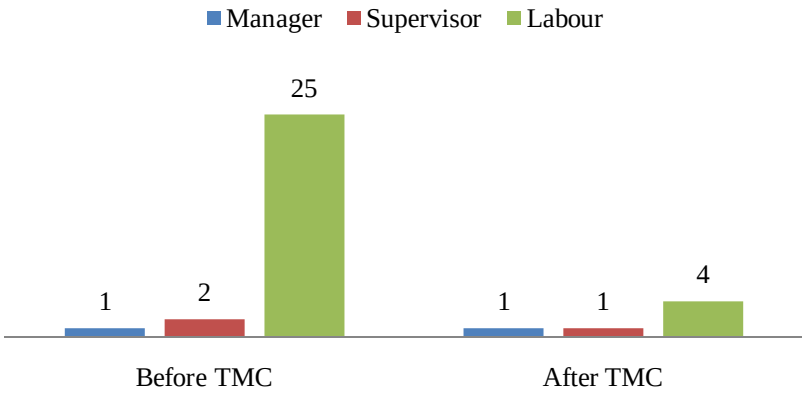
**Exhibit 34: Change in manpower requirement in ginning operations owing to modernisation under MM-IV**
***Case study of a unit with a production capacity of 300 bales per day***




*Source: Primary survey*

Units that have availed special subsidy to install automatic bale press have witnessed a reduction of 70% on an average in manpower requirement in the pressing operations. Exhibit 35 details the change in manpower requirement for pressing operations of a G & P unit having production capacity of 300 bales per day.

**Exhibit 35: Change in manpower requirement in the pressing operations owing to modernisation under MM-IV**




*Source: Primary survey*

Reduced labour intervention owing to modernisation has contributed significantly to reduction in contamination. However, the requirement for supervisors/technicians has increased in the ginning operation post-modernisation as the processes have become more sophisticated.

**Production**

G & P units have reported an increase of around 10-15% on an average in the number of bales produced per shift owing to modernisation of the ginning and pressing operations. However, some of the units based in Gujarat, Maharashtra and Andhra Pradesh that have completely modernised their factories have reported a higher increase in production.

In addition, some of the modernized G & P units covered during the primary survey have reported an increase in the ginning season by 2 months on an average. This can be partly attributed to the storage spaces built under TMC, which facilitate stocking of large quantities of kapas. As a result, modernized units are able to carry out ginning for around 7-9 months as against 6 months before modernistaion.

**Cost of processing kapas into bales**

As a part of the study, IMaCS analysed the cost of processing kapas into bales pre- and post-modernisation. In case of units who have undertaken modernisation as well as capacity expansion with financial assistance under MM-IV, the cost of processing has marginally reduced, in the range of 5-10%. However, in case of units who have undertaken only modernisation under MM-IV, the cost of processing of kapas into bales has remained unchanged pre- and post-modernisation.

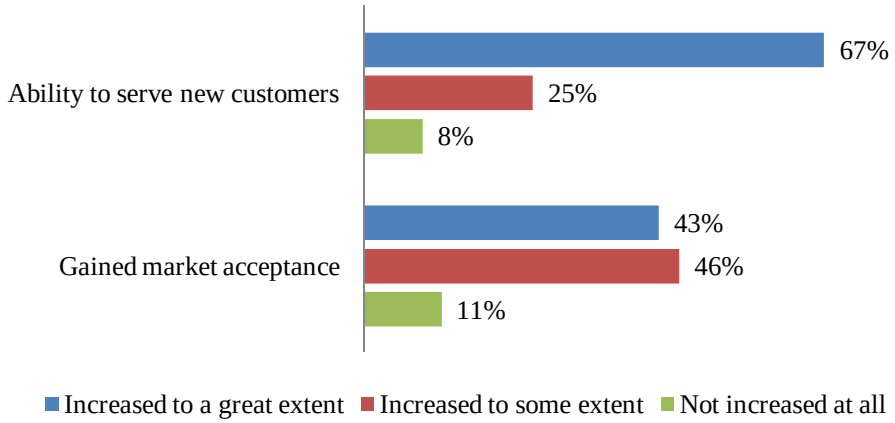
Modernisation of units under MM-IV has significantly reduced the man power requirement in ginning and pressing operations, however, installation of additional machines has increased the electricity consumption, which coupled with increased electricity tariff has negated the cost benefit owing to reduced man power requirement. Moreover, technically qualified staff needs to be employed for managing operations and maintenance of the modernised factories, which adds to the overall cost of processing. With modernisation, there are increased chances of breakdowns, which also add to the overall cost. As a result, cost of processing kapas into bales has marginally changed post modernisation.

#### 5.2.1.4. Price realisation

Modernisation has enabled G & P units to deliver quality cotton enabling them to earn price premium as against the conventional G & P units. According to inputs received during the primary survey, G & P units get a price premium of Rs. 300 to Rs.1000 per candy owing to better quality of processed cotton.

In addition, around 90% of the surveyed G & P units acknowledged that modernisation has also benefitted in terms of ability to serve new customers and gaining market acceptance, as seen in Exhibit 36.

**Exhibit 36: Impact of modernisation on marketing performance of G & P units**




*Source: Primary survey*

### 5.2.1.5. Impact of grading laboratory set up by G & P units

MM-IV of Technology Mission on Cotton provided financial assistance to G & P units who were willing to establish grading laboratory. As a part of the study, IMaCS analysed the impact of setting up HVI (High Volume Instrument) laboratories on the financial performance of the factories.

According to inputs received during the primary survey, grading laboratories enable the units to ascertain cotton quality before sales. As a result, the units are able to negotiate better price terms with the buyers, resulting in improved price realization.

Although grading laboratory has the potential to enhance Ginner's confidence and bargaining power, only 15 units[12] have availed of this subsidy.

### 5.2.1.6. Availability of good quality, contamination-free cotton for the Textile industry

Indian Textile industry believes that overall quality of cotton has improved to some extent because of the modernisation of Market Yards and G & P factories under TMC. The Industry has observed significant reduction in trash content of the cotton processed in modernized G & P factories. According to inputs received during the primary survey, trash content before modernisation varied from 4 to 8% depending on the variety of cotton and the stage of picking. Post modernisation, G & P factories are able to achieve a trash content of 1.5-3%. Improvement has also been observed in the short fibre content, kowdy and uniformity ratio of cotton to some extent, however, the Industry believes that these quality parameters depend on the time of picking of cotton. These improvements have helped the Textile industry with regards increase in productivity, reduction in yarn imperfections as well improvement in yarn quality. As a result, Textile industry primarily uses domestic cotton; Pima cotton and Egyptian cotton is imported only for special counts and as per end buyer's requirement.

[12] Source: TMC

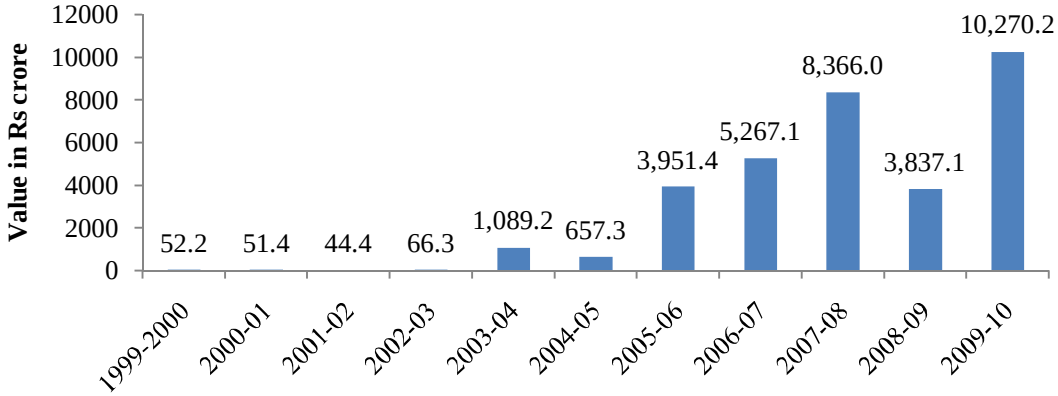
Textile industry also acknowledged improvement in packing of cotton; majority of the G & P factories pack cotton bales in cotton fabric. However, this demands further improvement as the cotton cloth used in some cases is of poor quality, which gets torn during transportation leading to contamination of cotton.

MM-III and MM-IV of TMC made significant efforts to prevent/remove contamination in cotton. Some of the Industry players have witnessed a decline in contamination, for instance, contamination per bale was reported to decline from 8-9 grams/bale to 5 grams/bale[13] in some varieties of cotton. Improvement has also been observed in the type of contamination observed in processed cotton. Before TMC, the cotton bales had contaminants such as sandals, gutkha packets, metal pieces, sand, stones, human hair, animal hair, feathers, leather pieces, yarn, jute fibre, and polypropylene fibre. Post modernisation and improvement in the management practices at the G & P factories, contaminants are mostly limited to seeds, oil, coir, jute and polypropylene fibre.

Improvement of cotton quality and the benefit accrued to the Textile industry can be observed in terms of increased demand for cotton fibre in export market. According to Indian Textile mills and Cotton exporters, the perception of Indian cotton with regards quality in the international market has undergone change; Shankar-6 (S-6) of Gujarat is considered equivalent in quality to internationally available cotton and has significant demand in export market[13]. Since Gujarat has the highest penetration of MM-IV among all states, the improvement in quality of S-6 can be partly attributed to MM-IV.

Further, the country has observed increasing exports of cotton, whereas the import of cotton has decreased over the years, as seen in Exhibit 37 and Exhibit 38. Moreover, Indian Cotton yarn exports have also increased over the years, as evident from Exhibit 39, indicating the competitiveness of the Textile industry, which can be partly attributed to availability of desired quality of raw material.

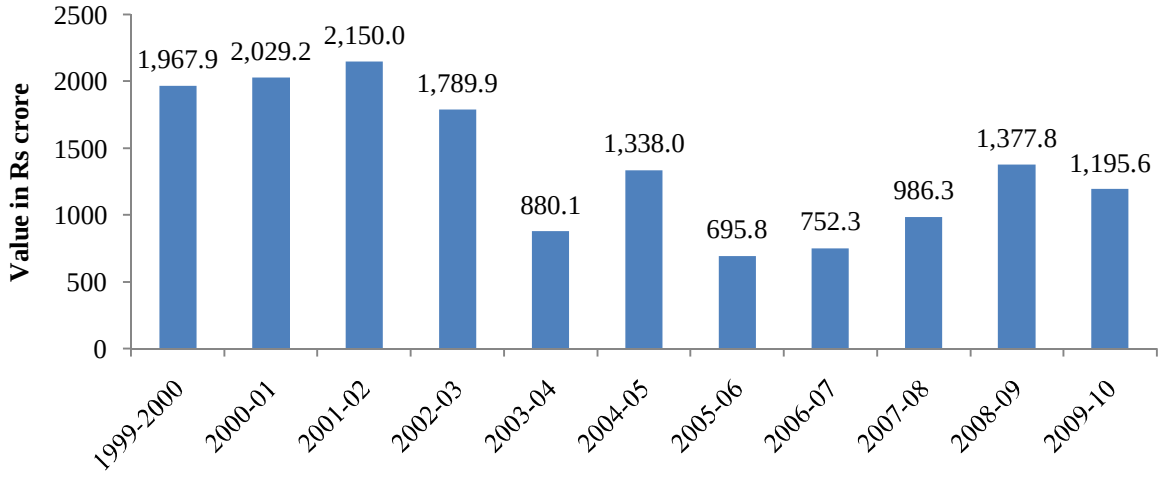
**Exhibit 37: Cotton exports from India**




*Source: DGCI&S, Kolkata*

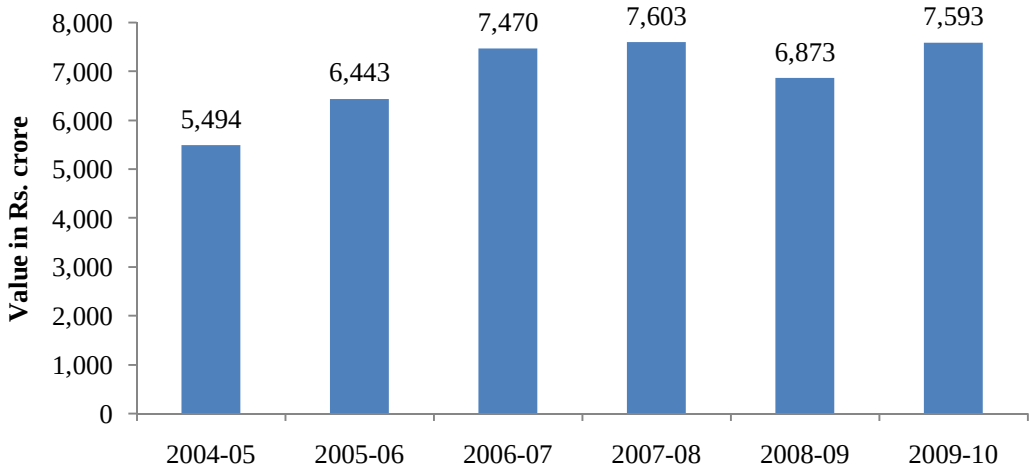
[13] Source: Primary survey

**Exhibit 38: Cotton imports by India**




*Source: DGCI&S, Kolkata*

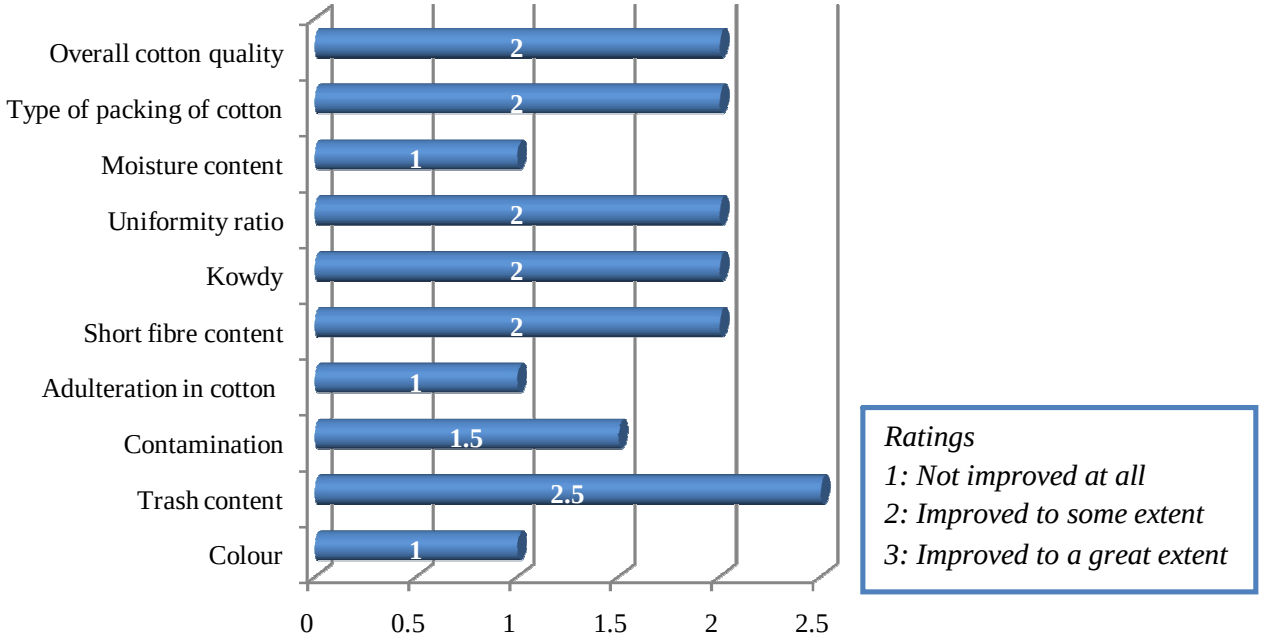
**Exhibit 39: Exports of Cotton yarn (excluding sewing thread)**




*Source: The Office of the Textile Commissioner, Ministry of Textiles*

Though the Industry has acknowledged the benefit accrued to them with regards availability of good quality cotton, Industry leaders rate the improvement achieved in cotton quality as 2 on a scale of 3, indicating that more needs to be done in the area of cotton quality. Impact of MM-III and MM-IV on cotton as perceived by the end user industry is detailed in Exhibit 40.

**Exhibit 40: Impact of MM-III and MM-IV on cotton quality - Textile industry's view**




*Source: Primary survey*

The key issues faced by the Textile industry and cotton traders with regards cotton quality are related to contamination, adulteration and moisture content.

- **Contamination is still persistent**: Though there is decrease in the level of contamination introduced at the Market Yard and G & P factory level, contamination from unhealthy storage practices at the farm level and inadequate transportation of cotton from farm to Market Yards/factories is still persistent. Many varieties of cotton continue to have high level of contamination.

  A 100% EOU mill in South India evaluated around 65,000 bales of cotton; the contaminants found are detailed in Exhibit 41[14]. DCH 32 cotton variety from majority of the stations as well as MCU 5 variety had serious level of contamination. Moreover, jute/hessian was the key contaminant with maximum occurrence per bale, followed by human hair.

[14] Source: "Measures to reduce contamination in ginneries", SITRA Focus, Vol 28, No. 5, January 2011.

**Exhibit 41: Contaminants removed by an EOU mill from cotton used by the mill**

| Variety | Station | Number of bales | Jute/ hessian | Human hair | Coloured yarn | Woven HDP/film | Coloured cotton (kgs) | Average occurrence of 1,2,3 and 4 per bale | Level of contamination |
|---|---|---|---|---|---|---|---|---|---|
| DCH 32 | A | 208 | 3,034 | 1,261 | 174 | 1,140 | 81 | 27 | Serious |
| | B | 35 | 1,361 | 570 | 309 | 252 | 10 | 71 | Serious |
| | C | 1,454 | 27,731 | 9,664 | 1,213 | 9,043 | 579 | 33 | Serious |
| | D | 101 | 10,643 | 3,769 | 869 | 1,336 | 39 | 165 | Serious |
| | E | 7,519 | 50,568 | 15,895 | 8,301 | 27,132 | 3,296 | 14 | Moderate |
| | F | 296 | 15,344 | 6,338 | 3,198 | 2,539 | 76 | 93 | Serious |
| | G | 885 | 14,338 | 2,327 | 822 | 2,182 | 156 | 22 | Serious |
| | H | 3,192 | 40,242 | 4,634 | 2,272 | 7,609 | 561 | 17 | Serious |
| | I | 239 | 5,616 | 737 | 325 | 914 | 44 | 32 | Serious |
| | J | 171 | 1,405 | 171 | 125 | 273 | 20 | 12 | Moderate |
| | K | 6,897 | 20,013 | 4,426 | 939 | 7,196 | 1,456 | 5 | Tolerable |
| | L | 15,124 | 46,081 | 9,798 | 2,249 | 16,590 | 3,150 | 5 | Tolerable |
| **MCU 5** | N | 1,002 | 168,985 | 19,165 | 5,766 | 9,604 | 313 | 203 | Serious |
| **S6** | O | 6,579 | 26,659 | 5,074 | 5,910 | 7,652 | 987 | 7 | Tolerable |
| **S6** | P | 22,595 | 91,750 | 15,336 | 21,381 | 28,772 | 12,880 | 8 | Tolerable |

| Average occurrence of contaminants per bale | | | | | | |
|---|---|---|---|---|---|---|
| **Variety** | **Station** | **Jute/hessian** | **Human hair** | **Coloured yarn** | **Woven HDP/film** | **Coloured cotton (kgs)** |
| **DCH 32** | A | 15 | 6 | 1 | 5 | 0.4 |
| | B | 39 | 16 | 9 | 7 | 0.3 |
| | C | 19 | 7 | 1 | 6 | 0.4 |
| | D | 105 | 37 | 9 | 13 | 0.4 |
| | E | 7 | 2 | 1 | 4 | 0.4 |
| | F | 52 | 21 | 11 | 9 | 0.3 |
| | G | 16 | 3 | 1 | 2 | 0.2 |
| | H | 13 | 1 | 1 | 2 | 0.2 |
| | I | 23 | 3 | 1 | 4 | 0.2 |
| | J | 8 | 1 | 1 | 2 | 0.1 |
| | K | 3 | 1 | 0 | 1 | 0.2 |
| | L | 3 | 1 | 0 | 1 | 0.2 |
| **MCU 5** | N | 169 | 19 | 6 | 10 | 0.3 |
| **S6** | O | 4 | 1 | 1 | 1 | 0.2 |
| **S6** | P | 4 | 1 | 1 | 1 | 0.6 |

*Source: SITRA, IMaCS analysis*

In addition, polypropylene (PP) contamination, which is one of the most severe types of contamination, is introduced because of storage of cotton in torn PP bags from farm to the ginneries/Market Yards and continues to be a key issue[15].

Contaminants are more harmful for the Spinning industry than the trash particles. Pieces of cloth and yarn present in cotton can reduce carding efficiency, cause unevenness in card webs, damage card wires resulting in shut down of the carding machines and associated production losses. Coloured plastic fibres, human hair and jute fibres negatively impact the yarn appearance, cause yarn irregularities and increase the number of thick places and neps in the yarn. As a result, Cotton Spinning industry has been forced to make huge investment to check contamination; equipment such as Jossi Vision-Shield, Barco, Loptex, Vetal Scan, etc. have been installed by the Industry at the blow room stage for detecting and removing contamination. Besides, equipment capable of detecting contamination are installed at Auto-corner by quality conscious Spinning mills. In addition, large number of workers is employed for manually segregating contamination.

- **Adulteration impairs the cotton quality**: Textile industry is of the opinion that certain G & P units are involved in unethical mixing of varieties of cotton for short term profits. Mixing is also done at the farm level either because of ignorance or for short term profits. As a result, quality of Indian cotton is inconsistent because of which Indian cotton is sold at a discount in the International markets.

- **Poor cotton quality during peak cotton season despite modernisation:** Textile mills confirmed that during peak cotton season, quality of processed cotton is below standards despite the modernisation of G & P units. It is believed that units bypass pre-cleaners and neglect the best practices to save cost. For instance, cotton prices have been rising since the commencement of current season in October 2010, reaching very high levels in March, 2011, as seen in Exhibit 42. According to inputs received during the primary survey, the quality of processed cotton available in the market during this period was far inferior to the regular standards.

**Exhibit 42: Monthly average spot rate (Rs./quintal)**

| Month | Year | Cotton variety | | | | |
|---|---|---|---|---|---|---|
| | | J-34 | H-4 | S-6 | Bunny | DCH 32 |
| **November** | **2010** | **11,389** | **11,979** | **12,260** | **12,260** | **14,510** |
| | *2009* | *6,608* | *6,693* | *7,030* | *6,689* | *11,529* |
| **December** | **2010** | **11,135** | **11,220** | **11,726** | **11,670** | **14,594** |
| | *2009* | *7,002* | *7,227* | *7,536* | *7,536* | *11,810* |
| **January** | **2010** | **12,063** | **12,457** | **12,598** | **12,963** | **17,687** |
| | *2009* | *7,199* | *7,199* | *7,509* | *7,536* | *11,332* |
| **February** | **2010** | **15,287** | **15,442** | **15,671** | **16,134** | **22,876** |
| | *2009* | *7,002* | *7,143* | *7,452* | *7,480* | *11,164* |
| **March** | **2010** | **16,702** | **16,297** | **16,790** | **17,250** | **23,328** |
| | *2009* | *7,339* | *7,508* | *7,846* | *7,874* | *11,782* |

*Source: Cotton Statistics and News, Cotton Association of India*

[15] Source: Primary survey

- **Bale packing is not standardised**: Though G & P units have started using cotton cloth for bale packing, the units do not follow uniform standard for quality of the packing cloth. Certain G & P units use poor quality material as a result of which cotton bales get damaged during transportation and get contaminated. Bale packing standard should be followed uniformly by all the G & P units.

### Other benefits

One of the key impacts of MM-IV of TMC has been the development of indigenous machinery manufacturers. Prior to the launch of TMC, there were very few Indian manufacturers of ginning and pressing machines, and the range of machines was limited to DR gins and conventional manual tramping bale presses. Very few Indian companies had the expertise to design conveyor systems, cotton cleaning machines and modern auto-tramping bale presses.

Launch of MM-IV increased the demand for modern ginning and pressing machines resulting in development of indigenous machinery manufacturers. At present, over 10 manufactures in India supply automatic bale presses, around 6 companies supply DR gins and conveyor systems and three companies manufacture all the machines required by the Ginning industry. Many of these companies are exporting their machines to Africa and the Far East.

## 5.2.2. Assessment and Rating system for Ginning & Pressing Factories

One of the key contributions of TMC to the Indian Cotton industry is the 'Assessment and Rating system for Ginning & Pressing Factories', a Government of India scheme to index the degree of modernization of Ginning & Pressing factories. Rating is the process of categorizing modernized G & P units into classes based on the quality of infrastructure comprising machinery, civil structural items and management practices including contamination level in the ginned cotton. Since the quality of cotton processed in a ginnery depends on the excellence of the civil infrastructure, the rating assigned to a unit is a performance indicator, of interest to both cotton traders and Textile mills, alike.

The scheme evaluates the infrastructural facilities and management practices in a modernized G & P factory on the basis of the criterion given in this scheme with the objective to facilitate G & P factories to know their present status and identify the scope for improvement as well as boost the credibility of their factory and use the rating as an effective marketing tool. Further, it aims to facilitate the cotton traders and Spinning mills to select G & P factories for processing their cotton to their quality requirements and to create a brand for clean cotton.

The methodology for objective assessment of G & P units was devised by the Technology Mission on Cotton. TMC carried out assessments for over 350 G & P units based on the scheme and discontinued assessment after a few years. Thereafter, Textiles committee has been assigned the task of rating of G & P factories by the Government of India.

A team of two experts from Textile Committee carry out onsite assessment of the G & P factories. During assessment, 21 infrastructural components comprising machinery and civil structures are assigned

marking, ranging from 1 to 5 on their technical merit. Weightage has also been assigned to these 21 components representing the degree of importance in controlling trash and contamination. Similar marking scheme is also prescribed for 13 management practices including contamination level in the ginned cotton. The percentage marks scored in infrastructural parameters and management parameters, fulfilment of criteria for essential parameters and the additional fulfilling requirements decide the rating. The ratings are awarded in five classes - five star, four star, three star, two star and single star.

Assessment and rating under the scheme is voluntary. Any G & P factory modernized under TMC or TUFS or by the factory on its own fund and meeting minimum eligibility criteria is eligible for assessment by Textiles Committee. G & P factories having hybrid facilities (both conventional and modern facilities) in the same premises are not eligible for assessment. As of November 2010, around 160 units have been rated by the Textile Committee.

The star rating assigned to a factory is intended for use as recognition and marketing tool for its capability in producing quality ginned cotton and not for use on the bale as product certification. Star rating once assigned is valid for 3 years and Textiles Committee organises compulsory annual surveillance visits to the factory within the validity period to ensure that the machinery, civil infrastructure and management practices continue to be in place. However, additional visits may be organized, if necessary. The rating fee and annual surveillance fee is borne jointly by the factory and the Government of India, with the latter's liability diminishing progressively over the years. Government of India bears a part of the rating fee and annual surveillance fee in the initial years to encourage the G & P factories to come forward and subject themselves to assessment.

For the first year the fee is termed as rating fee and for the second and third year the fee is termed as annual surveillance fee. The factories who got registered till March, 2011, the fee applicable was Rs.30, 000 per year. Of the fee amount of Rs 30,000 per year , 75% in 1st Year (rating fee), 50% in 2nd Year (annual surveillance fee) and 0% in 3rd Year (annual surveillance fee) was to be borne by Government of India. For factories registering from April, 2011 till March 2012, the fee applicable is Rs.35, 000 per year. Of the fee amount of Rs 35,000 per year, for the 1st Year, 75% (rating fee) will be borne by Government of India and from 2nd Year onwards 100% (annual surveillance fee) will be borne by the factories. For factories registering after April, 2012, the rating fee will be Rs.35,000 per year and 100% (rating and annual surveillance fee)will be borne by the factories from the 1st Year onwards.

Textile Committee conducts awareness programmes among the G & P units and the Spinning mills to increase the adoption of this Scheme. In addition, the Committee advertises about the Scheme in the print media including newspapers and leading textile magazines to promote more G & P units to come forward for this Scheme. Information regarding the rating assigned to the unit is placed on the Textile Committee's website for the benefit of both, the G & P units and the Textile industry.

### 5.2.3. Appropriateness of the Scheme

#### 5.2.3.1. Appropriateness of the components of the Scheme

One of the key success factors of MM-IV that enabled improvement in cotton quality has been insistence on meeting the requirements of ideal factory norms established under the Scheme. According to inputs received during the primary survey, various components of the Scheme under essential machines, essential infrastructure and essential conditions are appropriate for achieving the desired objective of clean cotton. The components have not only helped in reducing the level of trash and other impurities through installation of modern equipment but also reduced the level of contamination through automation resulting in minimum manual intervention. The components under essential infrastructure like pucca platforms, storage spaces for kapas, lint, bales and seeds, CC roads and boundary wall have further helped the modernised units to reduce contamination. In addition, the essential conditions under MM-IV have helped the modernised units to introduce best management and handling practices in their units.

Although the selection of components has been described as appropriate by the Industry, certain concessions given to ginneries in installing machinery have reduced the extent of modernisation. Permitting non-automatic bale press, allowing units to retain the central platform in the gin house and not insisting an automatic conveyor for lint from pala house to bale press have given rise to a class of semi-automated units among the modernised ginneries.

#### 5.2.3.2. Appropriateness of financial assistance given under the Scheme

MM-IV provided financial assistance up to 25% of the total project cost with a cap of Rs. 20 lakh for large units and Rs. 15 lakh for small units. In addition, special subsidy equivalent to 25% of the cost was given for installation of automatic bale press and grading laboratory, with a cap of Rs. 7 lakh and Rs. 4 lakh, respectively. As a part of the study, IMaCS analysed the appropriateness of the financial assistance in today's context.

According to inputs received during the primary survey, investment required for machinery and civil infrastructure to set up a standard G & P unit as per TMC norms, with production capacity of 6-8 bales/hour is around Rs. 2.5 - 3 crore. Under these circumstances, there is a need to revise the financial assistance provided under the Scheme.

#### 5.2.3.3. Appropriateness of the Scheme in light of adoption of mechanical harvesting

Farm labour is becoming scarce and costly in view of diversion of labour to other remunerative jobs in industry, construction, business, etc. Non-availability of sufficient labour for harvesting is an issue across the country. Going forward, the labour shortage problem is likely to aggravate, thus mechanical harvesting is being considered as an alternative for Indian farms.

Though mechanical harvesting has limitations for use in small, irregular and fragmented holdings with regards diversified cropping patterns, limited resource capacity of small and marginal farmers, etc., concerted efforts are being made to suit the technology to Indian conditions as well as to prepare Indian farms for this technology. For instance, John Deere India is developing a customised mechanical harvesting machine for Indian farms, which is under trial phase in regions of Punjab, Haryana and few states in Southern India. In addition, seed companies are developing cotton seeds, which are suitable for mechanical harvesting. According to inputs received during the primary survey, efforts are being made to introduce the technology in India within next 3-4 years.

Mechanically harvested cotton has high level of trash content (14% -18%), thus requires special kind of pre-cleaners. With the current machinery profile, TMC G & P factories are not equipped to clean such cotton. Leading ginning machinery manufactures are developing such pre-cleaners for the Indian Industry. Owing to limited resource capacity of small farmers, the pre-cleaners cannot be installed at the farm stage and need to be installed at the G & P factory, which needs additional investment. However, financial assistance under MM-IV does not provide for funds to install these pre-cleaners. Thus, financial assistance under the Scheme needs to be modified in this respect. Furthermore, the norms for an ideal G & P factory need to modified to include these pre-cleaners for the factories who process mechanically harvested cotton.

### 5.2.4. Need for continuation of the Scheme

Survey findings reveal that MM-IV has succeeded in improving the quality of cotton; processing of cotton in modernised G & P factories has resulted in reduction in trash level from 4-8% to 1.5-3%. The level of contamination has also reduced owing to better management practices adopted by the units as well as minimal manual handling of cotton owing to automation.

This has resulted in two fold benefit for the Cotton industry. On the one hand, modern ginneries are able to command a premium of Rs. 300 to 1000 per candy as compared to those who follow conventional methods of processing cotton. Furthermore, this Scheme has created awareness about cotton quality and impact of modernisation; as a result, beneficiary G & P factories have taken voluntary initiatives to upgrade their facilities further, thus benefiting the Cotton industry. On the other hand, good quality cotton is available for the Indian Textile industry, thus, enhancing competitiveness of the Industry.

With the Scheme being concluded in December 2010, there is a need to evaluate the need for continuation of this Scheme going forward in light of the changing dynamics of the Cotton industry. IMaCS analysed the need for continuation of MM-IV from the following perspective:

- Sufficiency of the infrastructure created so far
- Inclusive benefit of the Scheme across the country

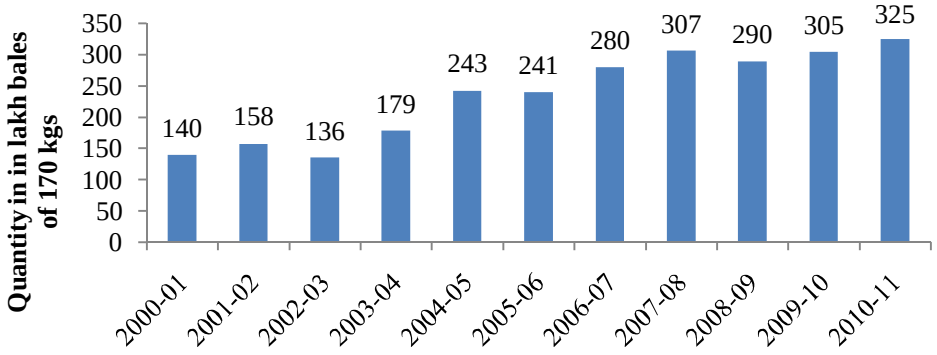
**Sufficiency of the infrastructure created so far**

MM-IV had a target of modernising 1,000 G & P factories, which was set against the level of cotton production of around 170 lakh bales. As of December 2010, 859 units were modernised under the Scheme. In addition, around 510 G & P units under non-SSI and 435 units under SSI have availed TUFS

for technology upgradation[16]. Assuming that some of the units have undertaken modernisation on their own, there is still significant ginning and pressing capacity in the country that uses conventional methods of processing resulting in sub-optimal quality of cotton.

Furthermore, cotton production in the country has increased over the years to reach 325 lakh bales in 2010-11, as detailed in Exhibit 43. In the case of MM-I and MM-II likely to be continued in any form, the cotton productivity is likely to improve further, going forward.

**Exhibit 43: Cotton production in India**




*Source: The Cotton Corporation of India*

The draft National Fibre Policy has assumed that yield of cotton will grow at a rate 4.7% over the next 10 years resulting in cotton production to reach 483 lakh bales by 2019-20, as detailed in Exhibit 44.

**Exhibit 44: Projections for cotton production and consumption (in lakh bales)**

| Year | Production | Consumption |
|---|---|---|
| **2014-15** | 384 | 323 |
| **2019-20** | 483 | 413 |

*Source: Draft National Fibre Policy, 2010-11(Scenario II)*

Considering these facts, the modernised ginning and pressing capacity created so far is not adequate to process the country's cotton produce. In case the cotton produce is not processed adequately, it will lead to huge volumes of cotton with sub-optimal quality that is not appropriate for use by the Textile industry. Thus, the efforts made under MM-I & MM-II will not be fully utilised for the benefit of the Indian Textile industry.

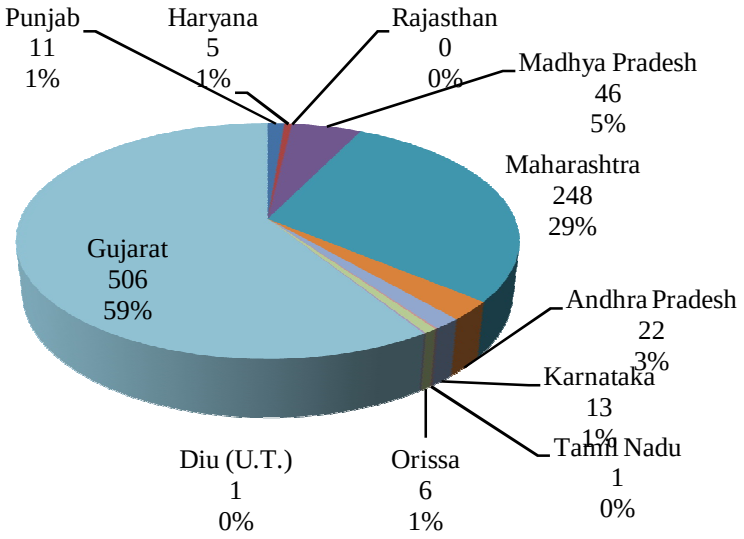
**Inclusive benefit of the Scheme across the country**

During the period from 2000 to 2010, 859 G & P factories have been modernised under MM-IV. Gujarat and Maharashtra have been the front runners in availing the scheme, with modernisation of 506 and 248,

[16] Source: Evaluation study of TUFS, the Office of the Textile Commissioner, Ministry of Textiles.
According to the Economic and Statistics Section of the Office of the Textile Commissioner, the figures are as reported by the banks and are not checked for any classification errors.

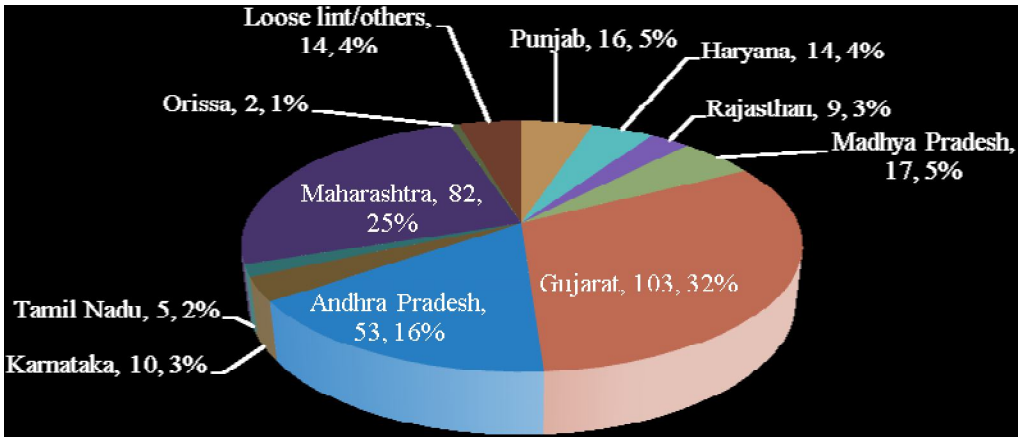
factories, respectively, as seen in Exhibit 45. Both these states are the leading producers of cotton, with a share of 33% and 26% in the country's total cotton production, as seen in Exhibit 46. However, the other key cotton producing states such as Andhra Pradesh, Madhya Pradesh, Punjab and Haryana have failed to exploit the benefit of the Scheme.

**Exhibit 45: Share of various states in total number of G & P factories modernised under MM-IV**




*Source: TMC*

**Exhibit 46: Share of various states in production of cotton (2010-11)**




*Source: The Cotton Corporation of India*

Madhya Pradesh witnessed lower penetration of the Scheme with only 46 out of the 350 units availing the scheme. According to inputs received during the primary survey, this can be attributed to limited awareness about the Scheme among the local G & P units[17].

[17] Source: Primary survey

**Exhibit 47: State-wise penetration of MM-IV**

| State | Estimated number of G & P units as of 2001[18] | Estimated number of G & P units as of 2010[19] | TMC units as of December 2010 | Percentage of units modernised under TMC |
|---|---|---|---|---|
| **Punjab** | 140 | 250 | 11 | 4% |
| **Haryana** | 140 | 150 | 5 | 3% |
| **Rajasthan** | 186 | 150 | 0 | NA |
| **Madhya Pradesh** | 309 | 350 | 46 | 13% |
| **Gujarat** | 496 | 900 | 506 | 56% |
| **Andhra Pradesh** | 610 | 700 | 22 | 3% |
| **Karnataka** | 403 | 200 | 13 | 7% |
| **Tamil Nadu** | 342 | 175 | 1 | 1% |
| **Orissa** | 11 | 100 | 6 | 6% |
| **Maharashtra** | 697 | 900 | 248 | 28% |
| **Diu (U.T)** | NA | 1 | 1 | 100% |
| **Total** | **3,334** | **3,876** | **859** | **22%** |

*The units include composite and standalone ginning and pressing units*

Southern region including the states of Andhra Pradesh, Karnataka and Tamil Nadu also witnessed dismal penetration of MM-IV, as evident from Exhibit 47. Though Andhra Pradesh has a significant share (17%) in the production of cotton, the state has lagged in availing the benefit of the Scheme with only 22 out of 700 factories being modernised under the Scheme. Some of the units in the State who have availed the Scheme have gone beyond TMC targets in terms of modernisation. However, there are a large number of small units in Southern states who have standalone ginning operations. Since cotton is produced in small quantity across many remote villages, low capacity ginning units have mushroomed across the states that cater to local demand for ginning and then collect processed cotton to bring it to standalone pressing units. Capacity of majority of these local units is very small, which is lower than TMC minimum standards for small units and, hence, the units were not eligible for modernisation. Moreover, the units are not willing to set up composite operations, which is one of the eligibility criteria for availing MM-IV.

Northern region including the states of Punjab, Haryana, and Rajasthan has also witnessed limited penetration of the Scheme, which can be attributed to lack of willingness to invest in establishing modernised ginning capacity.

There is a need to achieve inclusive improvement of G & P capacities across the country for which additional measures need to be taken under the Scheme. As a first step in this direction, the Office of Textile Commissioner is conducting a detailed census of the G & P units in the country under which 2,768 units[20] have been covered till date.

[18] Source: Textile Committee
[19] Source: Industry Associations of respective states
[20] Source: Economic and Statistics Section of the Office of the Textile Commissioner

### 5.2.5. Appropriateness of cotton bales specification IS 12171:1999 of BIS

Cotton bales specification IS 12171:1999[21] prescribes trash content, moisture regain and mass of bale of ginned cotton as well as the requirement of materials used for packing of bales. As a part of the study, IMaCS analysed the appropriateness of this standard in the present context.

According to inputs received during the primary survey, majority of the G & P factories as well as Textile mills are not utilising this standard for ensuring the quality of cotton; packing of bales is generally done as per the pre-set requirements of the Textile industry, which varies across mills. However, the Industry perceives the standard as obsolete; various aspects of the standard that need revision are detailed below:

**Trash content**

Trash limit set by the BIS standard is on a higher side. Considering the acceptability of cotton by the Textile industry as well as the export market, allowable trash content in cotton should be revised to stricter limits proposed by the TMC, as depicted in Exhibit 48.

**Exhibit 48: Trash limits for cotton: BIS vis-à-vis TMC standards**

| Staple category | Trash limit (%) | |
|---|---|---|
| | ***BIS standard*** | ***TMC standard*** |
| **Extra long** | 3 | 2 |
| **Long and medium long** | 5 | 3 |
| **Medium and short** | 6 | 3.5 |
| **Closed boll type cotton** | 10 | 6 |

**Tolerance limit for mass of bales**

BIS standard allows a tolerance limit of ± 10 kg for a bale of 170 kg in case of all cotton varieties except V-797, Kalagin, CJ-73 and Waghad varieties of cotton for which the allowable tolerance limit is ±7 kg for a bale of 155 kg. Industry experts believe that allowable tolerance limit should be reduced to ± 3 to 5 kg.

**Packing of bales**

BIS standard allows hessian cloth for packing of bales. In case cotton is stored in hessian or jute bags, jute fibres separate and get anchored to the mass of fibres leading to contamination of cotton during transportation. Thus, the standard should be modified to allow only cotton fabric for packing. Further, cotton sewing thread should be used for packing.

Furthermore, sometimes rusted iron bailing hoops are used for packaging of cotton, which leads to further contamination. Plastic straps should be allowed besides fresh iron hoops for packaging of cotton bales to avoid these issues.

[21]The BIS standard is attached as Annexure 6

**Marking of bales**

BIS standard details a procedure for marking of cotton bales according to which a starched cotton cloth label of 400 mm X 250 mm size placed securely below the bailing hoops shall bear the following information:

- Name of variety of cotton
- Press mark number
- Press running number
- Mass (weight) of pressed bale (kg)
- Crop year
- Station
- Country (in case of export only)

The cotton bales may also be marked with the Standard Mark.

However, Industry experts believe that Indian G & P factories should adopt bale tagging; the permanent bale identification (PBI) system will allow the Textile mills/cotton traders to streamline their inventory operations.

## 5.3.Recommendations

MM-IV has made a significant contribution to the Indian Cotton industry by revitalizing the otherwise neglected G & P sector. It not only improved the quality of cotton available to the Indian Textile industry by upgrading the conventional G & P factories to modern units as per the norms of ideal factory established by TMC, but also created awareness about the benefits of modernisation. This has resulted in many factories undertaking modernisation beyond the MM-IV standards to attain world class standards.

As a result of modernisation, trash content in the Indian cotton has reduced from high levels of 4-8% during the pre-TMC period to 1.5-3% post modernisation. Some of the progressive units have also succeeded in arresting cotton contamination; according to inputs received during the primary survey, contamination per bale was reported to decline from 8-9 grams/bale to 5 grams/bale[22] in some varieties of cotton. Furthermore, contaminants are mostly limited to oil, coir, jute, polypropylene fibre and human hair as against sandals, gutkha packets, metal pieces, sand, stones, found in the pre-TMC period. Improved technology has also resulted in better uniformity in cotton quality owing to removal of short fibre and kowdy. As a result of the measures taken under the Scheme, cotton is cleaner as compared to pre-TMC period and is packed into bales using cotton fabric.

Improved cotton quality and better bale packing has helped the units to earn a price premium of Rs. 300 to Rs. 1,000 per candy as well as earn prestigious client and better market acceptance. Furthermore, modernized units have reported better performance with around 10-15% increase in the number of bales produced per shift and minimal labour issues owing to significant reduction in man power requirement. In addition, storage spaces built under TMC facilitate stocking of large quantities of kapas, which has resulted in increase in the ginning season of majority of the modernized units by 2 months on an average.

In addition, increased demand for latest ginning and pressing machines has led to the growth of indigenous Ginning & Pressing Machinery industry, with many indigenous manufacturers offering wide range of machines that differ in efficiency, durability, energy consumption, ease of maintenance, level of technology and cost. This offers flexibility to the Indian G & P industry, and has resulted in additional employment.

However, Indian cotton quality is still not comparable to the international cotton. For instance, in countries such as the US, Australia and Uzbekistan, seed cotton is machine picked and arrives at the G & P factories with trash content in excess of 20%. However, the processed cotton has around 1-2% of trash and negligible contamination. Moreover, in African countries like Uganda, Tanzania, Zimbabwe, Sudan, Egypt, etc., the cotton is handpicked like in India, however, the trash content is comparable to the US standards[15]. As a result, despite modernisation, the Indian Textile industry is unable to get the best cotton quality; contamination and adulteration continue to be the key issues faced by the Industry.

As of December 2010, MM-IV has modernized 859 units out of around 3,876 units existing in the 10 states under consideration. In addition, around 510 G & P units under non-SSI and 435 units under SSI

[22] Source: Primary survey

have availed TUFS for technology upgradation[23]. Of the 859 units modernized under MM-IV, 754 are located in Gujarat and Maharashtra, whereas units of other key cotton producing states such as Andhra Pradesh, Madhya Pradesh, Punjab and Haryana have very poor representation, as detailed in Section 5.2.4. Furthermore, certain concessions were given to ginneries under MM-IV in installing machinery such as permitting non-automatic bale press, allowing units to retain the central platform in the gin house and not insisting an automatic conveyor for lint from pala house to bale press. All these concessions have the potential to add to cotton contamination, which is the pressing problem of Indian Cotton industry. Thus, there is still significant ginning and pressing capacity in the country that does not utilize the best technology for processing of cotton, resulting in sub-optimal quality of cotton.

Furthermore, the target of 1,000 G & P factories was set under MM-IV against the level of cotton production of approximately 170 lakh bales. However, cotton production has increased over the years to 325 lakh bales in 2010-11, and is estimated to increase to 483 lakh bales by 2019-20. In case the cotton produce is not processed adequately, it will lead to huge volumes of cotton with sub-optimal quality that is not appropriate for use by the Textile industry.

Under these circumstances, additional modernised ginning and pressing capacity needs to be created to process the country's cotton produce. **Thus, MM-IV should be continued in the next plan period for both existing as well as new G & P units, with certain modifications in the Scheme as detailed in the following sections.**

### 5.3.1. Revision of the norms for ideal factory to exclude all technical concessions provided under the original scheme

TMC norms and guidelines for an ideal factory were prepared after considerable discussions with various stakeholders i.e. Textile industry, Ginning industry and cotton traders. However, to ensure large scale participation of the Ginning industry, preference was given to a moderate kind of modernisation that would balance the level of modernisation with the investment involved. Thus, certain concessions were given to ginneries in installing machinery, as detailed in the following section.

- In early years of TMC, central/side platforms were permitted in the Gin House. However, in the X plan period central/side platforms were not allowed to be newly constructed, though, existing ones were allowed to be used even after modernisation of the unit. Existence of central/side platform increases manual handling of cotton as around 6-8 labourers in case of central platform and 18-24 labourers in case of side platforms are required to push cotton into the ginning machines. This is a source for contamination, which is the key issue faced by Indian cotton.

- In the modernisation projects of both IX and X plan periods, TMC permitted the usage of non-auto-tramping, two-stage bale press that already existed in the factories. In case of conventional manual bale press, operations such as filling the box, compacting cotton and transferring half pressed bale to

[23] Source: Evaluation study of TUFS, the Office of the Textile Commissioner, Ministry of Textiles.
According to the Economic and Statistics Section of the Office of the Textile Commissioner, the figures are as reported by the banks and are not checked for any classification errors.

the finisher require labour intervention thus, involving 18-20 labourers. Manual filling and compacting operations could lead to contamination of cotton. On the other hand, in automatic bale presses, feeding, compacting and final pressing of cotton takes place without involvement of labourers. Manual intervention is required only for introducing wrapping cloth and metal straps before final pressing operation, which reduces the number of labourers required for pressing operation to around 5.

- Factories installing new bale presses with subsidy benefit were required to set up conveyor system up to the press box with automatic feeding facility. However, in case of factories that were permitted to use the existing conventional non-auto tramping bale press and where the bale press was set up in the Pala House building, the third stage conveyor was optional.

The TMC norms should be revised to exclude all the aforementioned technical concessions; central/side platform should not be permitted as well as automatic bale press and third stage conveyor should be made compulsory for both new as well as existing G & P units availing the Scheme.

### 5.3.2. Measures to ensure adequate penetration of the Scheme across all states

Geographical penetration of MM-IV has been skewed with Maharashtra and Gujarat together accounting for over 85% of the units modernized under MM-IV. However, other major cotton producing states such as Punjab, Haryana and Andhra Pradesh have witnessed very poor penetration of the Scheme, with less than 5% of the total number of G & P units being modernized under the Scheme, as detailed in Section 5.2.4. MM-IV should endeavour to remove the geographic distortion by encouraging the units in the lagging states to come forward and avail the Scheme. This could be achieved through the following two measures.

**Setting state-wise targets for modernisation of factories**

MM-IV should have state-wise targets for modernisation of factories. Moreover, the targets should be set in proportion to the cotton production of the State. These targets should be reviewed from time to time and in case the units in certain states are unwilling to avail the Scheme, the TMC cell should revise the state-wise targets to ensure optimum utilization of funds under the Scheme.

**Sub-scheme for modernisation of small ginneries with a 6-gin norm**

One of the key deterrents in adoption of this Scheme in southern states has been the small size of the units. There are a large number of small units in Southern states with capacity lower than TMC standards and, hence, the units were not eligible for modernisation. In order to ensure adequate geographical penetration of the Scheme, a sub-scheme for tiny ginneries with a 6-gin norm should be introduced. The sub-scheme should be provided only for modernisation of the existing units with priority to the units who are part of cluster and have a common pressing facility attached to them. The sub scheme should not be available for setting up new units.

### 5.3.3. Formulating a sub-scheme under MM-IV to ensure full automation of the units that have availed technical concessions as well as the *hybrid units*

The technical concessions provided under MM-IV have reduced the extent of modernisation in the Indian G & P sector, and have created a class of semi-automatic units that are not up to the world class standards.

Moreover, relatively large G & P factories with two sets of gins installed in two adjacent halls were allowed modernisation to one set of gins under the TMC. This has resulted in *hybrid units* with modern machines and automation provided for one set of gins, whereas the other set of gins continues to process cotton in the conventional manner. This results in uncertainty of the quality of cotton processed by these units.

Adequate measures are required under the Scheme to modernize such G & P units. For the purpose, a sub-scheme should be drafted as a part of the MM-IV for modernisation of units that have already availed MM-IV benefit, however, have not modernized the units as per revised TMC norms. Financial assistance under this component could be as per the current norms of 25% of the cost of machines and civil infrastructure required for attaining the desired standards.

### 5.3.4. Revision of the financial assistance under the Scheme

MM-IV provided financial assistance up to 25% of the total project cost with a cap of Rs. 20 lakh for large units and Rs. 15 lakh for small units. In addition, special subsidy equivalent to 25% of the cost was given for installation of automatic bale press and grading laboratory, with a cap of Rs. 7 lakh and Rs. 4 lakh, respectively.

Over the years, there has been significant escalation in the cost of machines as well as construction. Though the share of TMC assistance under the Scheme could be retained at 25%, there is a need to revise the cap of financial assistance under the Scheme to match the current cost of establishing modernized G & P factories.

According to inputs received during the primary survey, investment required for machinery and civil infrastructure to set up a standard G & P unit as per TMC norms, with production capacity of 6-8 bales/hour is around Rs. 2.5 - 3 crore. Accordingly, the cap of financial assistance under the revised Scheme should be raised to Rs. 50 lakhs. This should be all-inclusive for a unit willing to achieve full automation of ginning and pressing operations as proposed in the revised Scheme thus, no separate subsidy needs to be offered for bailing press.

In case of the TMC G & P units and hybrid units who are willing to avail financial assistance for modernisation as per revised TMC norms, financial assistance could be as per the norms of 25% of the cost of machines and civil infrastructure required for attaining the desired standards.

### 5.3.5. Provision of financial assistance for special cleaners in case of adoption of mechanical harvesting

Considering the acute shortage of farm labour for harvesting, adoption of mechanical harvesting of cotton in future is inevitable. Efforts are being made by various stakeholders i.e. manufacturers of mechanical harvesting machines, seed companies, manufacturers of ginning machinery, etc., to develop the technology for Indian conditions; according to inputs received during the primary survey, efforts are being made to introduce the technology in India within next 3-4 years.

Mechanically harvested cotton has high level of trash content (14%-18%), thus requires special kind of pre-cleaners. With the current machinery profile, TMC G & P factories are not equipped to clean such cotton. Thus, additional investment is required by the factories to install special pre-cleaners to clean mechanically harvested cotton.

Considering the developments in the field of mechanical harvesting, Punjab and Haryana are likely to be the frontrunners in adoption of mechanical harvesting practices owing to large land holdings in these states. Thus, provision could be made for special pre-cleaners for these states. In case of other states, TMC cell should review the status of adoption of mechanical harvesting in India in 3-4 years' time.

Accordingly revisions should be made in the Scheme, with regards:

- Financial assistance: this should be revised to include the cost of special pre-cleaners.
- Norms for an ideal G & P factory: this should be modified to include special pre-cleaners as an essential machine for the factories that process mechanically harvested cotton.

### 5.3.6. Revision of cotton bales specification IS 12171:1999

Cotton bales specification IS 12171:1999 is obsolete and need to be revised to match the current cotton quality requirement of the international as well as domestic market. Ministry of Textiles and TMC cell should liaise with BIS to revise the cotton bales specification standard. Proposed revisions in IS 12171:1999 are detailed in Exhibit 49.

**Exhibit 49: Proposed revisions in cotton bales specification IS 12171:1999**

| Parameter | Proposed revision |
|---|---|
| **Trash content** | Allowable trash content in cotton should be revised to stricter limits proposed by the TMC |
| **Mass of bales** | Allowable tolerance limit should be reduced to ±5 kg |
| **Packing of bales** | Only cotton cloth should be permitted for bale packing. Furthermore, specifications for the quality of cotton cloth to be used for bale packing should be clearly defined. |
| **Baling hoops** | Plastic straps should be permitted besides fresh iron hoops for packing of bales. Furthermore, specifications for the quality of plastic straps to be used for bale packing should be clearly defined. |

Survey findings reveal that the cotton specification has not been adopted by majority of the G & P factories, resulting in inconsistent bale packing across the Industry. For instance, through G & P units have started using cotton cloth for bale packing, the units do not follow uniform standard for quality of

the packing cloth as a result of which cotton bales get damaged during transportation and get contaminated. Thus, measures need to be taken to ensure wide spread adoption of the revised cotton bales specification.

The key reason for limited adoption of IS standard is limited awareness about this standard and its benefits. In order to ensure widespread adoption of the standard, the specifications should be revised and the ginneries following the revised BIS standard should be allowed to put ISI mark on the cotton bales. This will have two fold benefits – ginneries following the norms will get visibility as well as better market acceptance, and this will encourage other ginneries to follow the standard, resulting in improved cotton quality. Further, the revised bales specifications should be made mandatory to improve Indian cotton quality benchmarks.

### 5.3.7. Measures to avoid adulteration in cotton

Adulteration i.e. mixing of various varieties of cotton is a significant problem for the Indian Industry, owing to which Indian cotton is sold at a discount in the international market. Adulteration may happen as a result of fraudulent mixing practices followed by ginneries, however, there is significant level of adulteration happening at the farm level. Indian farmers sow more than one variety of seed to hedge against the failure of crop. At the time of picking, farmers mix various varieties of cotton owing to lack of awareness regarding cotton quality. As a result, cotton quality is not consistent resulting in poor price realization.

Successful modernisation of G & P factories can ensure adequate availability of clean cotton to the Textile industry, however, the problem of mixing of cotton varieties cannot be arrested until the farmers have small land holdings, multiple varieties of seed are available in the market and farmers enjoy freedom to choose any type of seed. Thus, concerted efforts are required in the following areas to reduce adulteration:

**Limit the seed varieties available in the market**

Several varieties of upland cotton have been released for commercial cultivation in the country for different agro-climatic zones. These varieties do not offer advantages related to cotton quality as fibre strength of presently available varieties varies from 16-22 g/tex (at 3.2 mm gauge), which makes them unsuitable for high speed spinning. Furthermore, ginning out turn of these varieties is also low and varies from 32-35%[24]. Moreover, presence of these varieties increases the chances of adulteration.

Ministry of Textiles should liaise with the Ministry of Agriculture to ensure that select varieties of cotton seeds are made available to the farmers.

**Promote contract farming**

Ministry of Textiles should create awareness about the benefits of contract farming among the G & P factories. G & P factories should be encouraged to form a consortium and undertake contract farming of

[24] Source: Report on impact evaluation of MM-I and MM-II of Technology Mission on Cotton, Ministry of Agriculture, October 2010

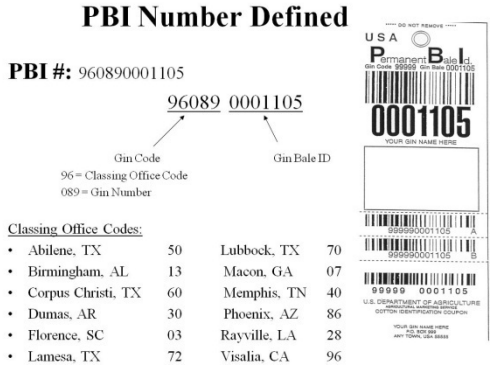
cotton. Under the contract farming, ginneries can supply single variety of seed to the farmers along with other farm inputs, at reasonable prices. This will help in arresting adulteration.

### 5.3.8. Formulating a scheme under MM-IV for bale tagging

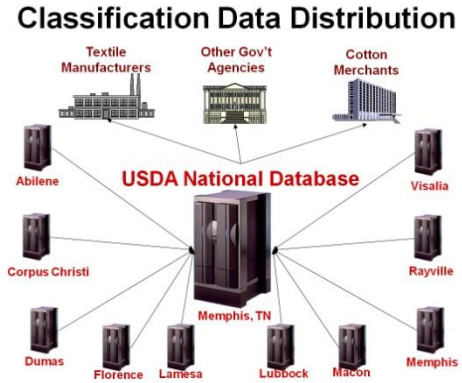
Bale tagging is a mechanism that can help the Textile industry to trace bale ownership and classify each bale of cotton, thus, helping them to streamline their inventory operations. This is not practiced in India unlike in the US where every bale is characterized for lint quality. Industry experts are of the opinion that Indian Cotton industry should also adopt bale tagging mechanism as this has the potential to benefit various stakeholders of the Cotton industry by improving accountability and transparency in the system.

**US System of Permanent Bale Identification System**

The US Cotton industry has developed a Permanent Bale Identification (PBI) system that enables a unique number and standard barcode to accompany a bale of cotton from the gin to the Textile mill. The PBI system includes a 12-digit, unique permanent bale identifier based on the gin code/gin bale number for every bale, which is displayed in both, a barcode and an eye-readable format on the bale tag. The first 5-digit gin code component of the PBI number is assigned by United States Department of Agriculture (USDA). The next 7-digit gin bale component of the PBI number is determined by the individual gins (and in some cases the warehouses).




USDA maintains a central cotton database called as National Cotton Database (NDB). Data from all USDA cotton classing facilities are stored in the NDB. The data is accessible by the bale owners and authorized agents through internet. The database customers must register to set up an account and to acquire user id and password. USDA also charges 5 cents (US dollars) per downloaded bale record. The database system and the classification of data distribution are detailed below.




*Source: www.ams.usda.gov/cotton, http://www.cotton.org, http://www.cottonusasourcing.com*

At present, the Indian Textile mills and exporters have no mechanism to track the supplier of individual bales who intentionally supply low quality cotton bales and almost charge the same price as good quality cotton supplier. If kept unchecked, the market system might slowly evolve into "lemon market" where the bad drives out the good because of information asymmetry between the buyer and the seller.

Adoption of Bale Identification System (BIS) will enable tracking and identification of bale purchased and supplied. This will not only help the Textile industry in inventory management but also discourage ginneries from malpractices such as adulteration. Traceability will encourage supply of good quality, which will in turn help in improving the image of Indian cotton in the International market. However, the benefits of bale tagging can be realized only if it is adopted across the Industry.

In order to encourage the G & P factories to implement bale tagging, a scheme for bale tagging should be formulated under MM-IV. G & P units, including both TMC and non-TMC units, willing to implement bale tagging should be provided a subsidy for the same. Considering the importance of this mechanism for the Cotton industry, TMC should share around 50-60% of the cost of implementing bale tagging for the first 5 years of this sub scheme; TMC share could be reduced going forward. In addition, Ministry of Textiles should make efforts to introduce regulation to mandate bale tagging for the Ginning & Pressing industry.

Ministry of Textiles could implement bale tagging through a formal committee formed under them, which should devise/adopt a bale tagging system for the Indian G & P industry. For the purpose, the barcoding system for cotton bales developed by CIRCOT could be considered for adoption.

CIRCOT has developed a software - '*Cotton Bale Manager*' to generate customised barcoded labels for identification of cotton bales in ginneries. A fully functional query based database is also integrated with bale information for easy retrieval of vital information. Help file has been prepared for understanding the operation of given software. The barcoded labels of 100 mm x 75 mm size have been prepared with plastic stickers. Cotton Bale Manger was successfully tested on the cotton bales prepared under National Agricultural Innovation Project (NAIP) of cotton value chain. The software was tested to satisfy various search operations and to generate report on fed queries.[25]. **Annexure 8** provides the details of the Cotton Bale Manager.

### 5.3.9. Measures to strengthen the scheme for 'Assessment and Rating of G & P factories'

Assessment and Rating system for G & P factories is a key contribution of TMC. The mechanism provides recognition and marketing tool to the G & P factories for their capability in producing quality ginned cotton. On the other hand, it facilitates cotton traders and Spinning mills to select G & P factories based on their quality requirements. Government of India has taken measures to promote the Scheme by bearing a part of the rating fee and annual surveillance fee in the initial years to encourage the G & P factories to come forward and subject themselves to assessment. However, the Scheme has achieved

[25] Source: Ginning Training Centre of CIRCOT, Nagpur

limited penetration owing to limited awareness about the benefits of this rating among the Spinning mills and Cotton traders.

Assessment and Rating system for G & P factories has the potential of promoting the culture of producing clean cotton, however, this could be achieved if the Scheme gets due recognition by the Spinning mills and Cotton traders. Concerted efforts are required in this area to ensure that majority of the G & P factories come forward for assessment. This could be achieved through creating a '*Clean Cotton Club*'.

The concept of Clean Cotton Club was initiated by the TMC cell to promote the culture of producing trash and contamination free cotton in the country. The objective of this Club is to provide a platform to bring together the G & P units that are capable of providing clean cotton and the Spinning mills and Cotton traders who want clean cotton and are willing to pay a premium for the same. Such an initiative is likely to give a marketing platform as well as increased market acceptance to the Ginneries that are capable of producing clean cotton, thus will encourage more ginneries to adopt better practices.

A suitable committee should be formed to create the '*Clean Cotton Club*'. G & P units that meet defined technical criteria as well as willing to produce clean cotton should be given membership in this club at a nominal fee. Star-rated G & P units should be given free membership in this Club. Further, imitative should be taken to enrol leading Textile mills and Cotton traders in the Club at a nominal fee. The committee should conduct regular meetings of this club to bring the buyers and sellers together. Further, a database of the members of the Club should be placed on the website of the Office of the Textile Commissioner. In addition, the committee should conduct awareness programmes for the Cotton Club and the Assessment and Rating system for G & P factories to ensure maximum participation in this Club. This could be done through leading Industry Associations for instance CITI.

# 6. Other aspects impacting the Cotton industry

## 6.1. Radio Frequency Identification Device

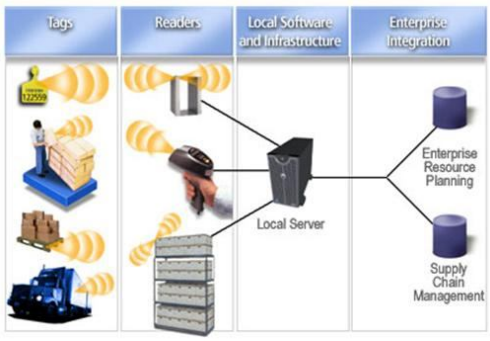
Indian Cotton industry is facing a critical issue of traceability of bales. Currently, there is no system to check the number of bales produced from a particular G & P unit as the units are no more governed under any law. The earlier Cotton Ginning and Pressing Factories Act, 1925 was repealed about a decade ago to provide thrust and incentive to the modernisation efforts in the cotton ginning and pressing sector. However, certain essential conditions like maintaining the ginning register containing a record of all cotton ginned in the factory, names of the persons for whom and the dates on which the cotton has been ginned and the amount ginned for each person, have also been stopped. Since there is no record of the amount of cotton ginned and the number of bales produced in the G & P units, there is high probability of tax evasion by these units.

Strategic interventions are required to curtail such practices. One of the measures could be tracking cotton bales through RFID.

**RFID system**

Radio Frequency Identification Device, or RFID, is a technology that uses radio frequency communication to automatically identify, track and manage objects, people or animals. It works by using two or more devices - a reader and tag. The devices are paired and able to "recognise" each other through the transmission of radio waves.

The tag or transponder, which contains an electronic circuit (transponder) is attached to the object that requires a unique identification code. When the tag comes near the reader, the radio frequency (RF) field generated by the reader will power up the tag and cause it to continuously transmit its data by 'pulsing' the radio frequency. The data is then captured by the reader and processed in the back-end by applications like the Enterprise Resource Planning (ERP) or Supply Chain Management systems. The diagram below illustrates the process:




Both the reader and tag can be sized and shaped in different ways. Due to the small size of the tag, it allows great freedom of movement and there is no need for direct contact for both devices. This results in a high level of convenience and flexibility for the user company. Some of the other advantages of RFID:

- No line of sight required
- No wear and tear due to its contactless nature
- Tags can be read even if covered with dirt or submerged
- Unalterable permanent serial code prevents tampering

*Source: **www.ida.gov.sg**, **http://www.technovelgy.com***

The G & P unit pressing system needs to be modified in such a way that as and when each bale is pressed, there is a provision to insert the RFID tag into the cotton bale, which will contain the information about the 12 digit identification code. The barcoding system developed by CIRCOT can be used for this purpose. The RFID tag used can be either active or passive, which need to be finalised based on economical and technical feasibility with inputs from RFID package integration players like AVAANA (http://www.avaana.com/) and ESSEN (http://www.essenrfid.com/) who have considerable experience in this field. The information from these RFID tags can be read by the readers, which can be installed at the door of pressing house and the exit gate of G & P units. The reader need to be connected to a large network that will send information on each bale to the servers at the regional level, which can be maintained under a formal committee created under the Ministry of Textiles. These servers can in-turn be connected at the central level at Ministry of Textile's head office to access the information on total number of bales produced by individual G & P units.

To provide a closed system, the readers can be installed at sea ports and the domestic textile mills, which also collect the information from the RFID tags and send it through the network to central server to provide a complete closed loop system of produced quantity, which can be matched with exported quantity and quantity consumed in domestic mills.

To start with, the technology can be implemented on a pilot basis at all the export oriented G&P units as the units will be able to afford the basic infrastructure needs of the technology like readers and servers. This pilot level testing will help to establish proof of concept. All the learning's from the implementation at the pilot level can be used for implementation at the nationwide level later on.

In order to make this system effective, it is essential that RFID system is adopted across the Indian Ginning & Pressing industry. For the purpose, adoption of this system can be enforced through a law, which needs to be reviewed by the Ministry of Textiles.

## 6.2.Financial assistance for Delinting plant

Linters account for 5-6% of the cotton seed left after the ginning operation. Linters have various applications such as furniture upholstery, mattresses, absorbent non-woven medical products, paper, currency, cellulose esters and ethers as cosmetics, paints, toothpaste, ice cream, salad dressing and cellulose acetate as plastics, films and yarn, as detailed in Exhibit 50, thus offer significant earning opportunity to the ginneries.

**Exhibit 50: Various applications of linters**

| | | | | |
|---|---|---|---|---|
| **Applications of linters** | **Cellulose nitrate** | **Paper** | **Films** | **Cellulose esters and ethers** |
| | Finger nail polish | Filters | X-ray | Lacquers |
| | Gun powders | Currency | Tapes | Paint |
| | Solid rocket propellant | Securities | Packaging | Toothpaste |
| | | | | Ice cream |
| | **Felts** | **Yarns** | **Food casings** | **Medical grade cotton** |
| | Mattresses | Twines | Sausages | |
| | Comforters | Rugs | Frankfurters | |
| | Upholstery | Candlewicks | | |

According to inputs received during the primary survey, Indian Cotton industry is not utilising the potential offered by linters to the full extent. Cotton seeds are being used for oil extraction without delinting, which not only results in loss of linter but also reduces the oil extraction from the cotton seed. In order to utilise this opportunity as well as increase the earning power of the ginneries, measures should be taken to promote delinting.

Financial assistance could be provided to the G & P units to establish Delinting plant. Guidelines and norms for ideal Delinting plant could be developed with the help of Industry stakeholders; ginneries willing to establish Delinting plant could be provided adequate assistance.

# Annexure 1: Semi-structured questionnaires for primary survey

## 1.1. Semi-structured questionnaire for Market Yards for evaluation of MM-III

S. No. | | | | |

Name of the respondent: _____

Designation: _____

Name of the APMC:

_____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1- INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. What are the activities carried out at the APMC?

| S.No. | Activity | Year of establishment | Year of development | Whether activity was implemented as a part of MM-III (Y/N) | Amount sanctioned (In Rs Lakh) | Total expenditure (In Rs Lakh) | TMC share (In Rs Lakh) | APMC share (In Rs Lakh) |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |

2. Please tell us about the cotton arrivals in the Market Yard before and after the Improvement Program under MM-III.

| | Cotton **(in quintal)** | | | |
|---|---|---|---|---|
| | Before Improvement Program | | After Improvement Program | |
| | Year 1 | Year 2 | Year 1 | Year 2 |
| Cotton production in catchment area | | | | |
| Cotton arrival in the APMC | | | | |

ASK FOR SOURCE/EVIDENCE FOR THEIR FEEDBACK

3. Please tell us about the current cotton arrival.

| | Cotton **(in quintal)** | |
|---|---|---|
| Parameter | 2008-09 | 2009-10 |
| Cotton production in catchment area | | |
| Cotton arrival in the APMC | | |

4. Has improvement in facilities under MM-III helped in reducing the village cotton sales? Please use 3 point scale to answer this question, where **3 means "village sales reduced to a great extent**" and **1 means "not changed at all"**. Also give the values.

| | Rating | | | Reason for the Rating | Village sales of cotton **(in quintal)** | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Before Improvement Program | | After Improvement Program | |
| | | | | | Year 1 | Year 2 | Year 1 | Year 2 |
| Village sales | 3 | 2 | 1 | | | | | |

5. Please tell us about the other commodities that arrive in the Market Yard. Give details regarding the procedure followed to manage various commodities (PROBE FOR PRECAUTIONS TAKEN TO AVOID CONTAMINATION OF COTTON)

| Commodities other than cotton | Weight **(in quintal)** |
|---|---|
| | |
| | |

6. How many people are employed in the Market Yard? What kind of different jobs they are engaged in?
   Total employee: _____
   Different jobs: _____

7. Do you have an Elected Market Committee? Yes/No

8. Which year was the committee formed? _____

9. Was the market committee formed as a part of the implementation of MM-III? Yes/No

10. What is the procedure of auction/tender, weighment and grading of kapas in the Market Yard? How has the procedure changed after the Improvement Program? What are the benefits accrued to you?

| Parameters | Procedure before Improvement Program | Procedure after Improvement Program | Benefits accrued |
|---|---|---|---|
| Auction/tender of kapas | | | |
| Weighment of kapas | | | |
| Grading of kapas* | | | |

*ASK WHETHER THE GRADING SYSTEM FOLLOWED IS VISUAL OR THROUGH INSTRUMENTS

11. Is the market yard being used for cotton? Yes/No
    If No, please give reasons

| Respondent feedback | Investigator's observations |
|---|---|
| | |

## *SECTION 3 - INFRASTRUCTURE*

12. Please provide the details of the infrastructure available at the Market Yard? How has each component benefited the marketing of cotton?

| | **Essential infrastructure** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Availability (Y/N) | Type | Area in **sq mt/Number** (whichever is applicable) | Whether created under MM-III Yes/No | If modernized under MM-III, give details about development | Whether being used primarily for cotton or other food grains | Short falls if any and reasons thereof | Benefits accrued due to Improvement* |
| Area | | | | | | | | |
| Pucca roads (Cement concrete type) | | | | | | | | |
| Pucca roads (Tar type) | | | | | | | | |
| Number of pucca platforms (Cement concrete type) | | | | | | | | |
| Number of pucca platforms (Tar type) | | | | | | | | |
| Large capacity weigh bridge | | | | | | | | |
| Small capacity weigh bridge | | | | | | | | |
| Parking place | | | | | | | | |
| Firefighting arrangement | | | | | | | | |
| Facilities for grading of cotton | | | | | | | | |
| Farmers Information Centre | | | | | | | | |
| **Essential amenities** | | | | | | | | |
| Rest house for farmers | | | | | | | | |
| Drinking water for farmers | | | | | | | | |
| Canteen | | | | | | | | |
| Water and fodder for cattle | | | | | | | | |
| **Optional/desirable infrastructure** | | | | | | | | |
| Shed over existing platforms | | | | | | | | |
| Warehouse facility | | | | | | | | |
| Facilities for testing of raw cotton | | | | | | | | |
| Earth-filling (leveling of land) | | | | | | | | |
| Electrification | | | | | | | | |
| Deep drainage | | | | | | | | |
| Compound wall | | | | | | | | |

1. CHECK REGARDING THE MAINTENACE OF THE INFRASTRUCTURE AND ALL FACILITIES
2. ASK FOR DATA REGARDING THE UTILISATION E.G. NUMBER OF TIMES THE WAREHOUSE HAS BEEN USED, HOW MANY FARMERS HAVE USED THE WARE HOUSE, ETC.

*REFER THE LIST BELOW TO PROBE FOR THE BENEFITS. MENTION ALL THE RELEVANT BENEFITS.

i. Reduction in level of cotton contamination
ii. Improvement in weighment of cotton
iii. Improvement in auction of cotton
iv. Improvement in grading of cotton
v. Better awareness about the price of cotton to the farmers
vi. Better awareness about picking of cotton, precautions to avoid contamination of cotton, etc. to farmers
vii. Increase in market yard sales of cotton
viii. Other benefits – list the benefits in the space provided below

13. According to you, are the components identified for improvement of Market Yards appropriate? Do you think some components should be added? Please give details.

14. What is the expenditure incurred on maintenance of the Market Yard? Please give details. What is the source of the money?

| Parameter | Cost incurred per year **(Rs Lacs)** |
|---|---|
| Manpower | |
| Consumables | |
| Repairs and maintenance of infrastructure | |
| TOTAL | |

15. Do you think any improvement is required in the MM-III for adequate functioning of the Market Yard? Please give details. PROBE FOR THE CHALLENGE FACED IN TERMS OF ADEQUACY OF FINANCIAL ASSISTANCE UNDER THE SCHEME.

## *SECTION 4 - FARMER INFORMATION CENTRE (FIC)*

**ADMINISTER THIS SECTION IF THE MARKET YARD HAS A FARMER INFORMATION CENTRE**

16. Year of set up: _____Year of operation: _____
REASONS FOR DELAY IN OPERATION

17. Is the FIC functional: Yes/ No
If NO, reasons thereof:

18. What facilities/equipment are available in the FIC? What improvements have been made under the MM-III? What are the types of information provided to the farmers?

| S.No. | Name of equipment/facility | Details of information provided to the farmer | Whether created under MM-III Yes/No | If improved under MM-III, give details of improvement |
|---|---|---|---|---|
| 1 | Computer | | | |
| 2 | Internet connection | | | |
| 3 | Kiosk | | | |
| 4 | Display board with updated information | | | |
| 5 | Others | | | |

PROBE WHETHER INFORMATION REGARDING USE OF INPUTS, TRANSFER OF TECHNOLOGY, PRICING, METHODS OF PICKING, STORAGE AND TRANSPORTATION, ETC. IS GIVEN TO THE FARMERS

19. What are the steps taken to promote the usage of FIC among the farmers?

20. How many farmers visit the FIC per day, on an average? List the facilities that are used by majority of the farmers. NOTE THE SOURCE FOR THIS DATA

21. Have you taken any steps to upgrade the FIC after the implementation of MM-III? If YES, please give details.

| S.No. | Facilities upgraded/added | Cost incurred (in Rs lakh) | Source of funds |
|---|---|---|---|
| | | | |
| | | | |

If NO, please give reasons thereof.

22. What is the expenditure incurred in maintenance of the FIC? Please give details.

| Parameter | Cost incurred per year **(In Rs Lacs)** |
|---|---|
| Manpower | |
| Consumables | |
| Repairs and maintenance of infrastructure | |
| TOTAL | |

## *SECTION 5 - TESTING LABORATORY*

**ADMINISTER THIS SECTION IF THE MARKET YARD HAS A TEST LABORATORY**

23. Year of set up: _____Year of operation: _____
REASONS FOR DELAY IN OPERATION

24. Is the Test Laboratory functional: Yes/ No
If NO, reasons thereof:

25. What equipment is available in the laboratory? What improvements have been made under the MM-III?

| S.No. | Name of the equipment | Number | Whether created under MM-III Yes/No | If improved under MM-III, give details of improvement | In Working Condition (Y/N) | Whether being used Yes/No |
|---|---|---|---|---|---|---|
| 1 | HVI/MVI/LVI | | | | | |
| 2 | Trash analyser | | | | | |
| 3 | Fineness (micronaire) | | | | | |
| 4 | Weighing balance | | | | | |
| 5 | Lilliput gin (small ginning machine) | | | | | |
| 6 | Moisture meter | | | | | |
| 7 | Others | | | | | |

VISIT THE LABORATORY AND TAKE THE DETAILS

26. Are there any shortfalls in the laboratory infrastructure? Why?

27. What tests are carried out in the laboratory? What is the level of utilization of the laboratory? Has the utilisation of laboratory increased over the years? Details of the test performed:-

| S.No. | Tests performed | No. of samples tested in a day | | |
|---|---|---|---|---|
| | | Year 1 | Year 2 | Year 3 |
| 1 | HVI test | | | |
| 2 | Trash content | | | |
| 3 | Moisture content | | | |
| 4 | Short fibre (%) | | | |
| 5 | Uniformity index | | | |
| 6 | Others | | | |

YEAR 1 REFERS TO THE YEAR OF SETTING OF LABORATORY. ADD THE COLUMNS FOR YEAR IF REQUIRED.

28. What are the standard procedures followed for lab operations such as calibration of equipment, maintaining lab equipment? ASK FOR DOCUMENTARY EVIDENCE TO CHECK WHETHER THE LAB IS BEING MAINTAINED ON REGULAR BASIS

29. What are the Standard Quality Parameters followed for the test?

30. How many people are employed in the test laboratory? How many of them dedicatedly work for the laboratory?

| Parameter | Before Improvement Program | | After Improvement Program | |
|---|---|---|---|---|
| | Year 1 | Year 2 | Year 1 | Year 2 |
| Total number of employees in the lab | | | | |
| Permanent employees in the lab | | | | |
| Numbers of dedicated employees | | | | |

TAKE DETAILS REGARDING THE QUALIFICATION OF THE PEOPLE

31. What sort of training is provided to the employees who work in the test laboratory? Who arranges for these trainings? How frequently these trainings are arranged?

| Year | Nature of training | Duration of training | Number of participants | Who organised the training |
|---|---|---|---|---|
| | | | | |
| | | | | |

32. What is the expenditure incurred on maintenance of the laboratory? Please give details. What is the source of funds?

| Parameter | Cost incurred per year **(In Rs Lacs)** |
|---|---|
| Manpower | |
| Consumables | |
| Repairs and maintenance of infrastructure | |
| TOTAL | |

33. What are the key challenges faced in adequate functioning of the laboratory? PROBE FOR THE CHALLENGE FACED IN TERMS OF RUNNING THE LABORATORY, MAINTAINING QUALIFIED STAFF, OPERATION EXPENDITURE, ETC.

## *SECTION 6 - IMPACT OF IMPROVEMENT PROGRAM UNDER MM-III*

34. To what extent do you believe the overall quality of cotton has improved post improvement in facilities at the Market Yard? PROBE FOR THE REASONS

| Parameter | Rating | Reasons for the rating |
|---|---|---|
| Quality has improved to a great extent | 3 | |
| Quality has somewhat improved | 2 | |
| Quality remained same | 1 | |

35. I am reading out the various quality parameters for cotton? Please rate the improvement in cotton quality that has been observed after the modernisation, where **3 means "improved to a great extent**" and **1 means "not improved at all"**. Also give the values for various quality parameters.

| Quality parameter | Rating | | | Reasons for the Rating | Quality before Improvement Program | Quality after Improvement Program | Source Test Reports/Discussion |
|---|---|---|---|---|---|---|---|
| Colour* | 3 | 2 | 1 | | | | |
| Trash content (%)* | 3 | 2 | 1 | | | | |
| Level of contamination | 3 | 2 | 1 | | | | |
| Type of contamination | 3 | 2 | 1 | | | | |
| Adulteration in cotton | 3 | 2 | 1 | | | | |
| Moisture content (%)* | 3 | 2 | 1 | | | | |

*ASK TO SHOW TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

36. According to you, which component of the Market Yard Improvement Program has primarily contributed to the improvement in quality of cotton? Why?

37. To what extent do you believe the system of auction/tender, weighment and grading of kapas has improved after availing MM-III? Please use 3 point scale to answer this question, where **3 means "improved to a great extent**" and **1 means "not improved at all"**.

| Parameter | Rating | | | Reason for the Rating |
|---|---|---|---|---|
| Auction | 3 | 2 | 1 | |
| Weighment | 3 | 2 | 1 | |
| Grading | 3 | 2 | 1 | |

38. According to you, to what extent the setting up of FIC has benefited the APMC? How?

| Parameter | Rating | Reason for the rating |
|---|---|---|
| Benefited to a great extent | 3 | |
| Somewhat benefited | 2 | |
| Not benefited | 1 | |

IN CASE THE RATING IS 3 OR 2, PROBE FOR THE BENEFITS ACCRUED FROM SETTING UP OF FIC.

39. According to you, to what extent the setting up of testing laboratory has benefited the APMC? How?

| Parameter | Rating | Reasons for the rating |
|---|---|---|
| Benefited to a great extent | 3 | |
| Somewhat benefited | 2 | |
| Not benefited | 1 | |

IN CASE THE RATING IS 3 OR 2, PROBE FOR THE BENEFITS ACCRUED FROM SETTING UP OF TESTING LABORATORY.

40. I am reading out the various parameters which are signs of the benefit of test laboratory? Please use 3 point scale where **3 means "improved to a great extent"** and **1 means "not improved at all"** to answer this question.

| Parameter | 3 | 2 | 1 | Reason for the Rating |
|---|---|---|---|---|
| Cotton quality | | | | |
| Awareness about quality among farmers | | | | |
| Price realization for the cotton | | | | |
| Profit for the farmers | | | | |

## *SECTION 7 - BRIEF FINANCIAL PARAMETERS*

41. What has been the change in price realization of cotton after the Improvement Program? Why?

| Variety of cotton | Percentage improvement in price realization | Reasons |
|---|---|---|
| | | |

42. What is the payment schedule to the farmers? How has this changed after implementing the Improvement Program under MM-III?

43. As you may be aware regarding the likely continuation of MM-I & MM-II of TMC and adoption of mechanical harvesting practices in future. In this context, is there a need to keep MM-III & MM-IV of TMC in operation? Why?

44. Is the Market Yard equipped to handle the mechanically harvested cotton? What challenges do you anticipate in this?

## *SECTION 8 - GENERAL OBSERVATIONS*

| Parameters | Comments |
|---|---|
| Cleanliness of Market Yard | |
| Unloading of cotton arriving at the Market Yard – whether unloaded on cemented surface or cotton cloth/tarpaulins or bare ground | |
| Location of paved platforms – whether they are away from trees to avoid contamination | |
| Heaping system of cotton – whether scientific heaping system is followed | |
| Mixing of cotton varieties – whether adequate precaution is taken for the same | |
| Precautions taken to avoid exposure of cotton to sun, wind and rain. | |
| Whether cotton heaps are covered with tarpaulin to avoid contamination from airborne impurities and rain water does not seep in | |
| Adequacy of other precautions taken to avoid cotton contamination occurring due to movement of cattle/other animals around cotton heaps, people sitting on cotton heaps, throwing waste on and around cotton heaps, etc. | |

## 1.2. Semi-structured questionnaire for farmers for evaluation of MM-III

S. No. | | | | |

Name of the farmer: _____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1- INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. Do you take cotton to market yard? Yes/No
2. Which mode of sale do you prefer? Market Yard / Direct sale to factories or traders
   Why?
3. Since which year have you started taking your cotton produce to the Market Yard? To which Market Yard do you take your cotton?
4. Please give details regarding the cotton sold by you in Market Yard vis-a-vis village sales.

| | Details (in quintals) | | | |
|---|---|---|---|---|
| | Before improvement of Market Yard | | After improvement of Market Yard | |
| | Year 1 | Year 2 | Year 1 | Year 2 |
| Total cotton sold | | | | |
| Cotton sold in Market Yard | | | | |
| Village sales | | | | |

CONSIDER THE MARKET YARD VISITED MOST OFTEN FOR THE YEAR OF IMPROVEMENT
ASK FOR SOME EVIDENCE FOR THEIR FEEDBACK

5. What methods do you use for picking of kapas? In general, what is the payment mechanism to the labourers?
6. How many days do you store the kapas before taking it to the Market Yard? How do you store the kapas before taking to Market Yard?
7. What methods do you adopt for maintaining the moisture in cotton?
   CHECK FOR PRACTICES LIKE ADDING WATER TO INCREASE THE WEIGHT OF COTTON
8. How do you transport kapas from fields to the Market Yard? Do you face any challenges?

## *SECTION 3 - IMPACT OF IMPROVEMENT IN INFRASTRUCTURE*

9. Are you aware that this Market Yard has been developed under the MM-III of the TMC scheme? Yes/No

10. Please give the following details.
    a. What difference have you observed in the Market Yard structure after this Improvement Programme?

| Parameter | Before Improvement Program | After Improvement Program |
|---|---|---|
| Condition of roads and platforms | | |
| Heaping of kapas | | |
| Awareness programmes | | |
| Facilities for farmers | | |
| Cleanliness | | |
| Measures to avoid mixing of different cotton varieties | | |
| Electrification | | |
| Support systems e.g. fire fighting, go down, entrance gate, boundary wall, etc. | | |

11. To what extent have you benefited from the improvement in the infrastructure in Market yards? Please use 3 point scale where **3 means "benefited to a great extent"** and **1 means "not benefited"** to answer this question. ASK FOR REASONS FOR THE RESPONSE IN EACH CASE

| **Essential infrastructure** | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Whether using the facility (Y/N) | 3 | 2 | 1 | Reasons | Shortfalls, if any |
| Area | | | | | | |
| Pucca roads (CC type) | | | | | | |
| Pucca roads (BT type) | | | | | | |
| Number of pucca platforms (CC type) | | | | | | |
| Number of pucca platforms (BT type) | | | | | | |
| Large capacity weigh bridge | | | | | | |
| Small capacity weigh bridge | | | | | | |
| Parking place | | | | | | |
| Firefighting arrangement | | | | | | |
| Facilities for grading of cotton | | | | | | |
| Farmers Information Centre | | | | | | |
| **Essential amenities** | | | | | | |
| Rest house for farmers | | | | | | |
| Drinking water for farmers | | | | | | |
| Canteen | | | | | | |
| Water and fodder for cattle | | | | | | |
| **Optional/desirable infrastructure** | | | | | | |
| Shed over existing platforms | | | | | | |
| Warehouse facility | | | | | | |
| Facilities for testing of raw cotton | | | | | | |
| Earth-filling (leveling of land) | | | | | | |
| Electrification | | | | | | |
| Deep drainage | | | | | | |
| Compound wall | | | | | | |

ASK FOR DATA REGARDING THE UTILISATION E.G. NUMBER OF TIMES THE WAREHOUSE HAS BEEN USED, ETC.

12. In what way has the improvement in Market yards benefited you? Please use 3 point scale where **3 means "improved to a great extent"** and **1 means "not improved at all"** to answer this question

| | 3 | 2 | 1 | **How?** |
|---|---|---|---|---|
| Cotton quality | | | | |
| System for auction | | | | |
| System for weighment | | | | |
| System for grading | | | | |
| Price realization for the cotton | | | | |
| Margins | | | | |
| Awareness about cotton quality, price, etc. | | | | |

ASK FOR EVIDENCE FROM THOSE WHO HAVE QUOTED 3/2 IN THE ABOVE QUESTION SUCH AS COTTON TEST REPORTS, PRICE OF COTTON, ETC. BEFORE AND AFTER THE IMPROVEMENT PROGRAM.

13. What is the procedure of auction/tender, weighment and grading of kapas in the Market Yard? How has the procedure changed after the Improvement Program? What are the benefits accrued to you?

| Parameters | Procedure before Improvement Program | Procedure after Improvement Program | Benefits accrued |
|---|---|---|---|
| Auction/tender of kapas | | | |
| Weighment of kapas | | | |
| Grading of kapas* | | | |

*ASK WHETHER THE GRADING SYSTEM FOLLOWED IS VISUAL OR THROUGH INSTRUMENTS

14. What has been the change in price realization of cotton after the Improvement Program? Why?

| Variety of cotton | Percentage improvement in price realization | | Reasons |
|---|---|---|---|
| | Cotton sold in market yard | Village sales | |
| | | | |

15. In how many days do you get the payment for the cotton sold in Market Yard? Has this improved after implementing the Improvement Program under MM-III in the Market Yard?

16. According to you, is further improvement required at the Market yards? Please give details.

## *SECTION 4 - IMPACT OF FARMER INFORMATION CENTRE*

17. How often do you visit the Farmer Information Centre (FIC)? List the facilities that you use at the FIC?

18. To what extent have you benefited from the setting up of FIC at the Market yards?

| Parameter | Rating | Reasons for the rating |
|---|---|---|
| Benefited to a great extent | 3 | |
| Somewhat benefited | 2 | |
| Not benefited | 1 | |

19. In what way has the FIC benefited you? Please use 3 point scale where 3 **means "improved to a great extent"** and **1 means "not improved at all"** to answer this question.

| | 3 | 2 | 1 | Reason for the rating |
|---|---|---|---|---|
| Awareness about cotton seeds and quality | | | | |
| Awareness about price | | | | |
| Awareness about difference between contamination & trash in cotton and precautions required to avoid contamination. | | | | |
| Awareness about picking methods (manual / machine) | | | | |
| Awareness about methods of storage of cotton | | | | |
| Technology transfer | | | | |
| Others | | | | |

CHECK FOR THE AWARENESS LEVELS USING THE FORMAT MENTIONED BELOW

| Parameters | Awareness (Yes/No) | Details |
|---|---|---|
| Awareness about cotton seeds and quality | | |
| Awareness about price | | |
| Awareness about difference between contamination & trash in cotton and precautions required to avoid contamination. | | |
| Awareness about picking methods (manual/ machine) | | |
| Awareness about methods of storage of cotton | | |
| Technology transfer | | |
| Others | | |

ASK TO SHOW SOME EVIDENCE TO SUPPORT THEIR FEEDBACK

## *SECTION 5 - IMPACT OF TEST LABORATORY*

20. Do you test your cotton samples in the test laboratory available at the Market Yard? If yes, please give details. If No, please give reasons thereof.

| Tests conducted for cotton | Number of samples tested in a cotton season |
|---|---|
| | |

21. Before setting up of test laboratory at the Market Yard where did you test your samples? What were the charges incurred?

22. To what extent have you benefited from the setting up of laboratory at the Market yards?

| Parameter | Rating | Reasons for the rating |
|---|---|---|
| Benefited to a great extent | 3 | |
| Somewhat benefited | 2 | |
| Not benefited | 1 | |

23. In what way has the laboratory benefited you? Please use 3 point scale where **3 means "improved to a great extent"** and **1 means "not improved at all"** to answer this question.

| Parameter | 3 | 2 | 1 | Reason for the Rating |
|---|---|---|---|---|
| Cotton quality | | | | |
| Price realization for the cotton | | | | |
| Profit | | | | |
| Awareness about cotton quality | | | | |

ASK TO SHOW SOME EVIDENCE OR TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

24. Any other observations of the investigator.

| |
|---|
| |

## 1.3. Semi-structured questionnaire for G & P factories for evaluation of MM-IV

S. No. | | | | |

Name of the respondent: _____

Designation: _____

Name of the G & P factory:

_____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1-INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. Type of unit

   Composite Ginning & Pressing unit Yes/No Standalone Ginning unit Yes/No

2. Whether established new or modernised under MM-IV: _____

3. If established new, indicate the date of establishment: _____

4. In case of modernisation of existing unit, please give following details.

| Date of establishment | Date of starting of modernization | Date of completion of modernization | Year of operation | Amount sanctioned (In Rs Lacs) | Total expenditure (In Rs Lacs) | TMC share (In Rs Lacs) | SOURCE OF DATA |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

5. Whether the G & P factory was graded by the Textile Committee? Yes/No

   If YES, when was the last time it was graded?

   Year: _____ Grade: _____ Source: _____

## *SECTION 3 - MACHINES*

6. Please give details regarding the machines in the factory.- What has been added?

| Machines | Details | Existing before MM-IV | Added under MM-IV | Functional (Y/N) If not functional, reasons thereof? |
|---|---|---|---|---|
| | | Number & Type | Number & Type | |
| Ginning Machines | 1. D R Gins<br>(a) Normal<br>(b) EL<br>(c ) Jumbo<br><br>2. Auto Feeder | | | |
| | Saw Gin | | | |
| Pre-cleaning machines | Horizontal cleaner (no.of rolls) | | | |
| | Inclined cleaner (no. of rolls) | | | |
| | Extractor cleaner | | | |
| Lint Cleaner | | | | |
| Mechanical/pneumatic system for kapas | | | | |
| Mechanical/pneumatic system for lint | | | | |
| Baling press | Capacity (bales/hr) | | | |
| | With/without trampers | | | |
| | Single double stage | | | |
| | With/without direct feed to box | | | |
| | Depth of pit | | | |
| Seed Conveyor | | | | |
| Humidifier/moisturisers | In Gin House | | | |
| | In Pala house | | | |
| | In press house | | | |
| Fire fighting System | OHT/sump | | | |
| | Diesel/Electric Pump | | | |
| | Hydrants, Hoses, Nozzles | | | |
| Underground wiring system | | | | |
| Weigh Bridge | Large (Capacity) | | | |
| | Small (Capacity) | | | |
| Generator capacity in KVA | | | | |
| Pod opener | | | | |
| Any other machines | | | | |

VISIT THE PLANT AND VERIFY WHETHER THE MACHINES ARE BEING USED

7. Do you use bale tagging software? Yes/No

## *SECTION 4 - INFRASTRUCTURE*

8. Please give details regarding the infrastructure and facilities in the factory.- Improvements

| Infrastructure | Details | Existing area **(sq mt)** | Added area **(sq mt)** | Total area **(sq mt)** |
|---|---|---|---|---|
| Storage space for the cotton | Open platform | | | |
| | Roofed platform | | | |
| | Godowns | | | |
| Covered storage for lint (pala) | | | | |
| Seed Storage Space | Open platform | | | |
| | Roofed platform | | | |
| | Godowns | | | |
| Bale storage Space | Open platform | | | |
| | Roofed platform | | | |
| | Godowns | | | |
| CC Road | | | | |
| Boundary Wall Fencing/Area of factory Compound | | | | |

## *SECTION 5 - IMPACT OF MODERNISATION UNDER MM-IV*

9. To what extent do you believe the overall quality of cotton has improved post modernisation of the factory?

| Parameter | Rating | Reason for the rating |
|---|---|---|
| Quality has improved to a great extent | 3 | |
| Quality has somewhat improved | 2 | |
| Quality remained same | 1 | |

10. I am reading out the various quality parameters for cotton? Please rate the improvement in cotton quality that has been observed after the modernisation of the factory, where **3 means "improved to a great extent**" and **1 means "not improved at all"**. Also give the values for various quality parameters.

| Quality parameter | Rating | | | Reasons for Rating | Quality before modernization | Quality after modernization | Source Test report/Discussion |
|---|---|---|---|---|---|---|---|
| Colour | 3 | 2 | 1 | | | | |
| Ginning out-turn **(%)** | 3 | 2 | 1 | | | | |
| Trash content **(%)** | 3 | 2 | 1 | | | | |
| Level of contamination | 3 | 2 | 1 | | | | |
| Type of contamination | 3 | 2 | 1 | | | | |
| Short fibre content (%) | 3 | 2 | 1 | | | | |
| Cut seeds **(%)** | 3 | 2 | 1 | | | | |
| Kowdy **(%)** | 3 | 2 | 1 | | | | |
| Uniformity ratio | 3 | 2 | 1 | | | | |
| Moisture content | 3 | 2 | 1 | | | | |

ASK TO SHOW TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

11. To what extent do you believe that modernisation has benefited the factory operations?

| Parameter | Rating | Reason for the rating |
|---|---|---|
| Improved to a great extent | 3 | |
| Somewhat improved | 2 | |
| Remained same | 1 | |

12. I am reading out the various parameters that are signs of improvement in the factory operations? Please give details regarding the improvement that has been observed after the modernisation of the factory.

| Parameter | Before modernization | After modernization |
|---|---|---|
| Quantity processed per cotton season **(in quintals)** | | |
| Number of bales produced per cotton season | | |
| Number of bales produced per shift | | |
| Unit cost per bale for processing of cotton into bales (**Rs)** | | |
| Better realization of average weight of a bale | | |
| Margins | | |

ASK FOR EVIDENCE SUCH AS PRODUCTION REPORT, SALES REPORT, ETC. TO SUPPORT THEIR FEEDBACK

13. In what way has the modernistaion helped your business? I am now reading different parameters. Please use same 3 point scale where **3 means "improved to a great extent**" and **1 means "not improved at all"** to answer this question.

| Parameter | 3 | 2 | 1 | Reasons for the Rating |
|---|---|---|---|---|
| Ability to serve new customers | | | | |
| Gaining market acceptance | | | | |
| Export opportunity | | | | |

ASK FOR EVIDENCE FROM THOSE WHO HAVE QUOTED 3/2 IN THE ABOVE QUESTION SUCH AS NEW CUSTOMERS ADDED, EXPORT TURNOVER OVER THE YEARS NEW EXPORT MARKETS, ETC.

14. Has the modernisation and automation of factories helped in rationalising the manpower requirement. Please give details.

| Number of employees per shift | Before modernization | After modernization |
|---|---|---|
| **Ginning** | | |
| Managers | | |
| Supervisors | | |
| Labourers | | |
| Others | | |
| **Pressing** | | |
| Managers | | |
| Supervisors | | |
| Labourers | | |
| Others | | |

15. According to you, which component of the MM-IV has benefited you the most? Please give details.

## *SECTION 6 - TESTING LABORATORY*

**ADMINISTER THIS SECTION IF THE FACTORY HAS A TEST LABORATORY**

16. Year of set up: _____Year of operation: _____
    REASONS FOR DELAY IN OPERATION

17. Is the Test Laboratory functional: Yes/ No
    If NO, reasons thereof:

18. What equipment is available in the laboratory? What improvements have been made under the MM-IV?

| S.No. | Name of the equipment | Number | Whether created under MM-IV Yes/No | If improved under MM-IV, give details of improvement | In Working Condition (Y/N) | Whether being used Yes/No |
|---|---|---|---|---|---|---|
| 1 | HVI/MVI/LVI machines | | | | | |
| 2 | Ginning Out turn balance | | | | | |
| 3 | Moisture meter | | | | | |
| 4 | Others | | | | | |

VISIT THE LABORATORY AND LIST DOWN THE EQUIPMENT

19. What tests are carried out in the laboratory? What is the level of utilization of the laboratory? Has the utilisation of laboratory increased over the years?

| S. No. | Test performed | No. of samples tested per shift |
|---|---|---|
| | | |
| | | |

20. What are the standard procedures followed for lab operations such as calibration of lab equipment, maintaining lab equipment? ASK FOR DOCUMENTARY EVIDENCE TO CHECK WHETHER THE LAB IS BEING MAINTAINED ON REGULAR BASIS.

21. What are the Standard Quality Parameters that have been set?

22. Are there any shortfalls in the laboratory infrastructure? Why?

23. How many people are employed in the test laboratory? How many of them dedicatedly work for the laboratory?

| Parameter | Before Improvement Program | | After Improvement Program | |
|---|---|---|---|---|
| | Year 1 | Year 2 | Year 1 | Year 2 |
| Total number of employees in the lab | | | | |
| Permanent employees in the lab | | | | |
| Numbers of dedicated employees | | | | |

TAKE DETAILS REGARDING THE QUALIFICATION OF THE PEOPLE ENGAGED

24. What is the expenditure incurred on maintenance of the laboratory? Please give details. What is the source of funds?

| Parameter | Cost incurred per year (Rs) |
|---|---|
| Manpower | |
| Consumables | |
| Repairs and maintenance of infrastructure | |
| TOTAL | |

25. What are the key challenges faced in adequate functioning of the laboratory? PROBE FOR THE CHALLENGE FACED IN TERMS OF RUNNING THE LABORATORY, MAINTAINING QUALIFIED STAFF, OPERATION EXPENDITURE, ETC.

## *SECTION 7- IMPACT OF TESTING LABORATORY*

26. To what extent have you benefited from the setting up of laboratory?

| Parameter | Rating | Reason for the rating |
|---|---|---|
| Benefited to a great extent | 3 | |
| Somewhat benefited | 2 | |
| Not benefited | 1 | |

27. In what way has the laboratory benefited you? Please use 3 point scale where **3means "improved to a great extent"** and **1 means "not improved at all"** to answer this question

| Parameter | 3 | 2 | 1 | Reason for the Rating |
|---|---|---|---|---|
| Cotton quality | | | | |
| Price realization for the cotton | | | | |
| Margins | | | | |
| Others | | | | |

ASK FOR OTHER BENEFITS ACCRUED FROM THE TESTING LAB.

## *SECTION 8 - BRIEF FINANCIAL PARAMETERS*

28. Length of Cotton Season (months)

| Before modernisation | After modernisation |
|---|---|
| | |

29. Sales details

| | | Before modernisation | After modernisation |
|---|---|---|---|
| No. of bales sold in one season | Domestic market | | |
| | Export market | | |
| Premium on bales processed in modernised unit | Domestic market (Village level/market level) | | |
| | Export market | | |
| Job work | 1. Rate per bale<br>2. Quantity in quintal per cotton season | | |

30. Annual expenditure on maintenance of machine. What is the source of funds?

| | Before modernisation | After modernisation |
|---|---|---|
| a. Annual expenditure on maintenance of m/c<br>b. Other infrastructure activities | | |

31. What has been the change in price realization of cotton after MM-IV? Why?

| Variety of cotton | Percentage improvement in price realization | Reasons |
|---|---|---|
| | | |
| | | |

## *SECTION 9 - OTHERS*

32. According to you, are the components identified for improvement of G & P factories appropriate? Do you think some components should be added? Please give details.

33. Whether the modernisation of G & P factories has simultaneously geared up the indigenous G & P machine manufacturers to supply the required machines?

34. Do you think any improvement is required in the MM-IV for adequate functioning of the factory? Please give details. PROBE FOR CHALLENGE FACED IN TERMS OF ADEQUACY OF FINANCIAL ASSISTANCE.

35. As you may be aware regarding the likely continuation of MM-I & MM-II of TMC and adoption of mechanical harvesting practices in future. In this context, is there a need to keep MM-III & MM-IV of TMC in operation? Why?

36. Is your G & P factory equipped to handle the mechanically harvested cotton? What challenges do you anticipate in this?

37. Any other observations of the investigator.

## 1.4. Semi-structured questionnaire for non-TMC Market Yards for evaluation of MM-III

S. No. | | | | |

Name of the respondent: _____

Designation: _____

Name of the APMC: _____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1- INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. What are the activities carried out at the APMC?

| Activity | Year of establishment | Total expenditure (In Rs Lacs) |
|---|---|---|
| | | |
| | | |

2. Please tell us about the cotton arrivals in the Market Yard.

| | Cotton (in quintals) | | | | |
|---|---|---|---|---|---|
| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
| Cotton production in catchment area | | | | | |
| Cotton arrival in the APMC | | | | | |

ASK FOR SOURCE/EVIDENCE FOR THEIR FEEDBACK

3. What is the level of village sales in your area? Please use 3 point scale to answer this question, where **3 means "Significant village sales"** and **1 means "No village sales at all"**. Also give the values.

| | | | | | Village sales (in quintal) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rating | | | Reason for the rating | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 |
| Village sales | 3 | 2 | 1 | | | | | | |

4. Please tell us about the other commodities that arrive in the Market Yard. Give details regarding the procedure followed to manage various commodities (PROBE FOR PRECAUTIONS TAKEN TO AVOID CONTAMINATION OF COTTON)

| Commodities other than cotton | Weight **(in quintal)** |
|---|---|
| | |
| | |

5. How many people are employed in the Market Yard? What kind of different jobs they are engaged in?

   Total employee: _____
   Different jobs: _____

6. Do you have an Elected Market Committee? Yes/No

7. Which year was the committee formed? _____

8. What is the procedure of auction/tender, weighment and grading of kapas in the Market Yard?

| Parameters | Procedure |
|---|---|
| Auction/tender of kapas | |
| Weighment of kapas | |
| Grading of kapas | |

## *SECTION 3 - INFRASTRUCTURE*

9. Please provide the details of the infrastructure available at the Market Yard?

| Parameter | Availability (Y/N) | Type | Area in **sq mt/Number** (whichever is applicable) | Short falls if any and reasons thereof | Source of Information |
|---|---|---|---|---|---|
| Area | | | | | |
| Pucca roads (Cement concrete type) | | | | | |
| Pucca roads (Tar type) | | | | | |
| Number of pucca platforms (Cement concrete type) | | | | | |
| Number of pucca platforms (Tar type) | | | | | |
| Large capacity weigh bridge | | | | | |
| Small capacity weigh bridge | | | | | |
| Parking place | | | | | |
| Firefighting arrangement | | | | | |
| Facilities for grading of cotton | | | | | |
| Farmers Information Centre | | | | | |
| Rest house for farmers | | | | | |
| Drinking water for farmers | | | | | |
| Canteen | | | | | |
| Water and fodder for cattle | | | | | |
| Shed over existing platforms | | | | | |
| Warehouse facility | | | | | |
| Facilities for testing of raw cotton | | | | | |
| Earth-filling (leveling of land) | | | | | |
| Electrification | | | | | |
| Deep drainage | | | | | |
| Compound wall | | | | | |

CHECK REGARDING THE MAINTENACE OF THE INFRASTRUCTURE AND ALL FACILITIES

## *SECTION 4 – COTTON*

10. Are you facing any issues related to the cotton quality? Please tell us about the cotton quality related issues faced at your market yard. Please give the reasons for the same.

| Quality parameter | Key issues | Reasons |
|---|---|---|
| Colour* | | |
| Trash content (%)* | | |
| Level of contamination | | |
| Type of contamination | | |
| Adulteration in cotton | | |
| Moisture content (%)* | | |

*IN CASE THE YARD HAS A TEST LABORATOTY, ASK TO SHOW TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK.

11. Is there any difference in the price realisation of cotton as against a TMC market yard? Why?

| Variety of cotton | Price in TMC yard | Price in non-TMC yard | % price premium | Reasons for the difference |
|---|---|---|---|---|
| | | | | |
| | | | | |

12. Do you conduct any awareness programs for the farmers? Yes/No

    If YES, what type of information is given to the farmers?

| Type of awareness program | Information given to farmers | Number of farmers who benefited from this in a cotton season |
|---|---|---|
| | | |
| | | |
| | | |

PROBE WHETHER INFORMATION REGARDING USE OF INPUTS, TRANSFER OF TECHNOLOGY, PRICING, METHODS OF PICKING, STORAGE AND TRANSPORTATION, ETC. IS GIVEN TO THE FARMERS.

13. What is the payment schedule to the farmers?

14. Are you aware about the MM-III of TMC? Yes/No

15. Why did you not avail that scheme for modernisation of the market yard? Please give reasons.

16. In case the scheme is extended, would you like to avail that scheme? Why?

17. Is the Market Yard equipped to handle the mechanically harvested cotton? What challenges do you anticipate in this?

## *SECTION 5 - FARMER INFORMATION CENTRE (FIC)*

**ADMINISTER THIS SECTION IF THE MARKET YARD HAS A FARMER INFORMATION CENTRE**

18. Year of set up: _____

19. Is the FIC functional: Yes/ No
    IF NO, reasons thereof: _____

20. What facilities/equipment are available in the FIC? What are the types of information provided to the farmers?

| S.No. | Name of equipment/facility | Details of information provided to the farmer |
|---|---|---|
| 1 | Computer | |
| 2 | Internet connection | |
| 3 | Kiosk | |
| 4 | Display board with updated information | |
| 5 | Others | |

PROBE WHETHER INFORMATION REGARDING USE OF INPUTS, TRANSFER OF TECHNOLOGY, PRICING, METHODS OF PICKING, STORAGE AND TRANSPORTATION, ETC. IS GIVEN TO THE FARMERS.

21. What are the steps taken to promote the usage of FIC among the farmers?

22. How many farmers visit the FIC per day, on an average? List the facilities that are used by majority of the farmers. NOTE THE SOURCE FOR THIS DATA

## *SECTION 6 - TESTING LABORATORY*

**ADMINISTER THIS SECTION IF THE MARKET YARD HAS A TEST LABORATORY**

23. Year of set up: _____

24. Is the Test Laboratory functional: Yes/ No
IF NO, reasons thereof:

25. What equipment is available in the laboratory?

| S.No. | Name of the equipment | Number | In Working Condition (Y/N) | Whether being used Yes/No |
|---|---|---|---|---|
| 1 | HVI/MVI/LVI | | | |
| 2 | Trash analyser | | | |
| 3 | Fineness (micronaire) | | | |
| 4 | Weighing balance | | | |
| 5 | Lilliput gin (small ginning machine) | | | |
| 6 | Moisture meter | | | |
| 7 | Others | | | |

VISIT THE LABORATORY AND TAKE THE DETAILS

26. Are there any shortfalls in the laboratory infrastructure? Why?

27. What tests are carried out in the laboratory? What is the level of utilization of the laboratory? Details of the test performed:-

| S. No. | Tests performed | Average no. of samples tested in a day |
|---|---|---|
| 1 | HVI test | |
| 2 | Trash content | |
| 3 | Moisture content | |
| 4 | Short fibre (%) | |
| 5 | Uniformity index | |
| 6 | Others | |

## *SECTION 7 - GENERAL OBSERVATIONS*

| Parameters | Comments |
|---|---|
| Cleanliness of Market Yard | |
| Unloading of cotton arriving at the Market Yard – whether unloaded on cemented surface or cotton cloth/tarpaulins or bare ground | |
| Location of paved platforms – whether they are away from trees to avoid contamination | |
| Heaping system of cotton – whether scientific heaping system is followed | |
| Mixing of cotton varieties – whether adequate precaution is taken for the same | |
| Precautions taken to avoid exposure of cotton to sun, wind and rain. | |
| Whether cotton heaps are covered with tarpaulin to avoid contamination from airborne impurities and rain water does not seep in | |
| Adequacy of other precautions taken to avoid cotton contamination occurring due to movement of cattle/other animals around cotton heaps, people sitting on cotton heaps, throwing waste on and around cotton heaps, etc. | |

## 1.5. Semi-structured questionnaire non-TMC G & P factory for evaluation of MM-IV

S. No. | | | | |

Name of the respondent: _____

Designation: _____

Name of the G & P factory:_____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1-INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. Type of unit

   Composite Ginning & Pressing unit Yes/No Standalone Ginning unit Yes/No

| Date of establishment | Year of operation | Total expenditure (In Rs Lacs) | SOURCE OF DATA |
|---|---|---|---|
| | | | |

2. Whether the G & P factory was graded by the Textile Committee? Yes/No
   If YES, when was the last time it was graded?
   Year: _____ Grade: _____ Source: _____

***SECTION 3 - MACHINES***

3. Please give details regarding the machines in the factory.

| Machines | Details | Number & Type | Functional (Y/N) | If not functional, reasons thereof? |
|---|---|---|---|---|
| Ginning Machines | 1. D R Gins<br>(a) Normal<br>(b) EL<br>(c ) Jumbo<br>2. Auto Feeder | | | |
| | Saw Gin | | | |
| Pre-cleaning machines | Horizontal cleaner (no.of rolls) | | | |
| | Inclined cleaner (no. of | | | |

| Machines | Details | Number & Type | Functional (Y/N) | If not functional, reasons thereof? |
|---|---|---|---|---|
| | rolls) | | | |
| | Extractor cleaner | | | |
| Lint Cleaner | | | | |
| Mechanical/pneumatic system for kapas | | | | |
| Mechanical/pneumatic system for lint | | | | |
| Baling press | Capacity (bales/hr) | | | |
| | With/without trampers | | | |
| | Single double stage | | | |
| | With/without direct feed to box | | | |
| | Depth of pit | | | |
| Seed Conveyor | | | | |
| Humidifier/moisturisers | In Gin House | | | |
| | In Pala house | | | |
| | In press house | | | |
| Fire fighting System | OHT/sump | | | |
| | Diesel/Electric Pump | | | |
| | Hydrants, Hoses, Nozzles | | | |
| Underground wiring system | | | | |
| Weigh Bridge | Large (Capacity) | | | |
| | Small (Capacity) | | | |
| Generator capacity in KVA | | | | |
| Pod opener | | | | |
| Any other machines | | | | |

VISIT THE PLANT AND VERIFY WHETHER THE MACHINES ARE BEING USED

4. Do you use bale tagging software? Yes/No

## *SECTION 4 - INFRASTRUCTURE*

5. Please give details regarding the infrastructure and facilities in the factory.

| Infrastructure | Details | Total area **(sq mt)** |
|---|---|---|
| Storage space for the cotton | Open platform | |
| | Roofed platform | |
| | Godowns | |
| Covered storage for lint (pala) | | |
| Seed Storage Space | Open platform | |
| | Roofed platform | |
| | Godowns | |
| Bale storage Space | Open platform | |
| | Roofed platform | |
| | Godowns | |
| CC Road | | |
| Boundary Wall Fencing/Area of factory Compound | | |

## *SECTION 5 - COTTON*

6. Please tell us about the quality of cotton that is produced in your unit.

| Quality parameter | Details | Source: Test report/Discussion |
|---|---|---|
| Colour | | |
| Ginning out-turn **(%)** | | |
| Trash content **(%)** | | |
| Level of contamination | | |
| Type of contamination | | |
| Short fibre content (%) | | |
| Cut seeds **(%)** | | |
| Kowdy **(%)** | | |
| Uniformity ratio | | |
| Moisture content | | |

ASK TO SHOW TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

7. Please tell us about your factory operations?

| Parameter | Details |
|---|---|
| Quantity processed per cotton season **(in quintals)** | |
| Number of bales produced per cotton season | |
| Number of bales produced per shift | |
| Unit cost per bale for processing of cotton into bales (**Rs)** | |
| Better realization of average weight of a bale | |
| Margins | |

ASK FOR EVIDENCE SUCH AS PRODUCTION REPORT, SALES REPORT, ETC. TO SUPPORT THEIR FEEDBACK

8. Please give details regarding the man power requirement

| Number of employees per shift | After modernization |
|---|---|
| **Ginning** | |
| Managers | |
| Supervisors | |
| Labourers | |
| Others | |
| **Pressing** | |
| Managers | |
| Supervisors | |
| Labourers | |
| Others | |

9. Do you provide any training to the workers? Please give details.

| Year | Nature of training | Duration of training | Number of participants | Who organised the training |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## *SECTION 6 - TESTING LABORATORY*

**ADMINISTER THIS SECTION IF THE FACTORY HAS A TEST LABORATORY**

10. Year of set up: _____

11. Is the Test Laboratory functional: Yes/ No
    If NO, reasons thereof:

12. What equipment is available in the laboratory?

| S.No. | Name of the equipment | Number | In Working Condition (Y/N) | Whether being used Yes/No |
|---|---|---|---|---|
| 1 | HVI/MVI/LVI machines | | | |
| 2 | Ginning Out turn balance | | | |
| 3 | Moisture meter | | | |
| 4 | Others | | | |

VISIT THE LABORATORY AND LIST DOWN THE EQUIPMENT

13. What tests are carried out in the laboratory? What is the level of utilization of the laboratory?

| S. No. | Test performed | No. of samples tested per shift |
|---|---|---|
| | | |
| | | |

14. Are there any shortfalls in the laboratory infrastructure? Why?
15.

## *SECTION 7 - BRIEF FINANCIAL PARAMETERS*

16. Length of Cotton Season (months) _____

17. Sales details

| | | Details |
|---|---|---|
| No. of bales sold in one season | Domestic market | |
| | Export market | |
| Job work | 3. Rate per bale<br>4. Quantity in quintal per cotton season | |

## *SECTION 8 - OTHERS*

18. Are you aware about the MM-IV of TMC? Yes/No

19. Why did you not avail that scheme for modernisation of the factory? Please give reasons.

20. In case the scheme is extended, would you like to avail that scheme? Why?

21. Is your G & P factory equipped to handle the mechanically harvested cotton? What challenges do you anticipate in this?

## 1.6. Semi-structured questionnaire for stakeholder meetings

S. No. | | | | |

Name of the respondent: _____

Designation: _____

Name of the organisation: _____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1- INTRODUCTION & WARM UP***

- Introduce self/IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

1. Please tell us about the cotton arrivals in the Market Yard before and after the Improvement Program under MM-III. Has improvement in facilities under MM-III helped in reducing the village cotton sales?

| Details (in quintal) | Before Improvement Program | | After Improvement Program | |
|---|---|---|---|---|
| | Year 1 | Year 2 | Year 1 | Year 2 |
| Cotton production in catchment area | | | | |
| Cotton arrival in the APMC | | | | |
| Village sales | | | | |

ASK FOR EVIDENCE FOR THEIR FEEDBACK

2. Do you have an Elected Market Committee? When was this committee formed? What are the functions of the committee?

3. What is the procedure of auction/tender, weighment and grading of kapas in the Market Yard? How has the procedure changed after the Improvement Program? What are the benefits accrued to you?

| Parameters | Procedure before Improvement Program | Procedure after Improvement Program | Benefits accrued |
|---|---|---|---|
| Auction/tender of kapas | | | |
| Weighment of kapas | | | |
| Grading of kapas* | | | |

*ASK WHETHER THE GRADING SYSTEM FOLLOWED IS VISUAL OR THROUGH INSTRUMENTS

4. According to you, are the components identified for improvement of Market Yards appropriate? Do you think some components should be added? Please give details.

5. Do you think any improvement is required in the MM-III for adequate functioning of the Market Yard? Please give details.
   PROBE FOR THE CHALLENGE FACED IN TERMS OF ADEQUACY OF FINANCIAL ASSISTANCE UNDER THE SCHEME.

## *SECTION 3 - IMPACT OF IMPROVEMENT PROGRAM UNDER MM-III*

6. To what extent do you believe the overall quality of cotton has improved post improvement in facilities at the Market Yard?

| | |
|---|---|
| Quality has improved to a great extent | 3 |
| Quality has somewhat improved | 2 |
| Quality remained same | 1 |

ASK TO SHOW SOME EVIDENCE OR TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

7. I am reading out the various quality parameters for cotton? Please give details regarding the improvement in cotton quality that has been observed after the Improvement Program.

8. I am reading out the various quality parameters for cotton? Please give details regarding the improvement in cotton quality that has been observed after implementation of MM-III & MM-IV.

| Quality parameter | Before TMC | After TMC |
|---|---|---|
| Colour | | |
| Trash content (%) | | |
| Level of contamination | | |
| Type of contamination | | |
| Adulteration in cotton | | |
| Short fibre content (%) | | |
| Kowdy (%) | | |
| Uniformity ratio | | |
| Moisture content | | |
| Type of packaging of cotton | | |
| Others | | |

9. According to you, which component of the Market Yard Improvement Program has primarily contributed to the improvement in quality of cotton?

10. To what extent do you believe the system of auction/tender, weighment and grading of kapas has improved after availing MM-III? Please give details regarding the improvement observed?

| | |
|---|---|
| System improved to a great extent | 3 |
| System has somewhat improved | 2 |
| System remained same | 1 |

ASK TO SHOW SOME EVIDENCE TO SUPPORT THEIR FEEDBACK

11. According to you, to what extent the setting up of FIC has benefited the APMC? How?

| | |
|---|---|
| Benefited to a great extent | 3 |
| Somewhat benefited | 2 |
| Not benefited | 1 |

IN CASE THE RATING IS 3 OR 2, PROBE FOR THE BENEFITS ACCRUED FROM SETTING UP OF FIC.

12. According to you, to what extent the setting up of testing laboratory has benefited the APMC?

| | |
|---|---|
| Benefited to a great extent | 3 |
| Somewhat benefited | 2 |
| Not benefited | 1 |

IN CASE THE RATING IS 3 OR 2, PROBE FOR THE BENEFITS ACCRUED FROM SETTING UP OF TESTING LABORATORY.

13. I am reading out the various parameters which are signs of the benefit of test laboratory? Please use 3 point scale where **3 means "improved to a great extent"** and **1 means "not improved at all"** to answer this question

| Parameter | 3 | 2 | 1 |
|---|---|---|---|
| Cotton quality | | | |
| Awareness about quality among farmers | | | |
| Price realization for the cotton | | | |
| Profit for the farmers | | | |

ASK FOR EVIDENCE FROM THOSE WHO HAVE QUOTED 3/2 IN THE ABOVE QUESTION SUCH AS COTTON TEST REPORTS, PRICE OF COTTON, ETC. BEFORE AND AFTER THE IMPROVEMENT PROGRAM

## *SECTION 7 - BRIEF FINANCIAL PARAMETERS*

14. What has been the average price realization of cotton before and after the Improvement Program?

| Variety of cotton | Price realization | |
|---|---|---|
| | Before the Improvement Program | After the Improvement Program |
| | | |
| | | |

ASK TO SHOW SOME EVIDENCE TO SUPPORT THEIR FEEDBACK

15. What is the payment schedule to the farmers? How has this changed after implementing the Improvement Program under MM-III?

16. As you may be aware regarding the likely continuation of MM-I & MM-II of TMC and adoption of mechanical harvesting practices in future. In this context, is there a need to keep MM-III & MM-IV of TMC in operation? Please give details.

17. Is the Market Yard equipped to handle the mechanically harvested cotton? What challenges do you anticipate in this?

## 1.7. Semi-structured questionnaire for meetings with Textile mills and cotton traders

S. No. | | | | |

Name of the respondent: _____

Name of the Mill: _____

Address: _____

District: _____ City: _____ State: _____ Pin: _____

Telephone no/Mobile no: _____

***SECTION 1- INTRODUCTION & WARM UP***

- Introduce self / IMaCS
- Give a brief description of the purpose of visit
- Ensure about confidentiality

***SECTION 2 - GENERAL INFORMATION***

45. What is the quantum of cotton that you purchase in each cotton season? What is the share of imported and domestic in the total cotton purchased? What is the source for the cotton?

| Year | Variety of cotton | Cotton sourced (in quintal) | | | Source of imported cotton | Source of domestic supply |
|---|---|---|---|---|---|---|
| | | Imported | Domestic | Total | | |
| | | | | | | |
| | | | | | | |

46. In case of domestically sourced cotton, do you buy cotton from the Market Yards or directly from farmers? Why?

***SECTION 3 - IMPACT OF MM-III & MM-IV of TMC***

47. According to you, have the MM-III (i.e. improvement in market yards) and MM-IV (i.e. technology up gradation of G & P factories) improved the marketing of cotton? Please give details.
GIVE DETAILS REGARDING BENEFITS ACCURED IN TERMS OF COTTON QUALITY, TRANSPARENCY IN WEIGHMENT, GRADING AND AUCTION OF COTTON, ETC.

48. To what extent do you believe the overall quality of cotton has improved post implementation of MM-III & MM-IV?

| | |
|---|---|
| Quality has improved to a great extent | 3 |
| Quality has somewhat improved | 2 |
| Quality remained same | 1 |

ASK TO SHOW SOME EVIDENCE OR TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

49. I am reading out the various quality parameters for cotton? Please give details regarding the improvement in cotton quality that has been observed after implementation of MM-III & MM-IV.

| Quality parameter | Before TMC | After TMC |
|---|---|---|
| Colour | | |
| Trash content (%) | | |
| Level of contamination | | |
| Type of contamination | | |
| Adulteration in cotton | | |
| Short fibre content (%) | | |
| Kowdy (%) | | |
| Uniformity ratio | | |
| Moisture content | | |
| Type of packaging of cotton | | |
| Others | | |

ASK TO SHOW TEST REPORTS OF COTTON TO SUPPORT THEIR FEEDBACK

50. To what extent do you believe that the improvement in cotton quality, cotton marketing practices and kapas processing achieved through MM-III & MM-IV have benefited your operations?

| | |
|---|---|
| Benefited to a great extent | 3 |
| Somewhat benefited | 2 |
| Not benefited | 1 |

ASK TO SHOW SOME EVIDENCE TO SUPPORT THEIR FEEDBACK

51. I am reading out the various parameters which are signs of the benefit to the mill operations? Please use 3 point scale where **3 means "improved to a great extent"** and **1 means "not improved at all"** to answer this question.

| | 3 | 2 | 1 |
|---|---|---|---|
| Availability of contamination-free cotton | | | |
| Ease of processing cotton | | | |
| Quality of end product | | | |

ASK FOR EVIDENCE FROM THOSE WHO HAVE QUOTED 3/2 IN THE ABOVE QUESTION SUCH AS TEST REPORTS, ETC.

52. Has this translated into reduction in cost of processing or increase in sales/profits? Please give details.
ASK FOR EVIDENCE SUCH AS INCREASE IN SALES OF END PRODUCT, ADDING NEW CUSTOMERS, ETC.

53. Post implementation of MM-III & MM-IV how does the Indian cotton quality and marketing practices rank against the global standards?

| Cotton quality | |
|---|---|
| India | Global standards |
| Marketing system | |
| Indian practices | Global practices |

ASK FOR EVIDENCE FOR THEIR FEEDBACK

54. Do you believe the Indian cotton quality, cotton marketing system and kapas processing requires further up gradation? Please suggest the possible improvements that can be implemented under the MM-III & MM-IV.

55. Is there a need to improve the existing Indian Standard COTTON BALES SPECIFICATION IS 12171:1999 of BIS? Please give details?

56. As you may be aware regarding the likely continuation of MM-I & MM-II of TMC and adoption of mechanical harvesting practices in future. In this context, is there a need to keep MM-III & MM-IV of TMC in operation? Please give details.

## Annexure 2: List of TMC Market Yards covered during the primary survey

| S. No. | APMC Market Yard |
|---|---|
| **GUJARAT** | |
| **1** | Botad |
| **2** | Godhada |
| **3** | Bodeli |
| **4** | Gondal |
| **5** | Jamnagar |
| **6** | Wadhwan |
| **7** | Dhandhuka |
| **8** | Morbi |
| **9** | Modasa |
| **10** | Jasdan |
| **11** | Jaitpur |
| **12** | Amreli |
| **13** | Sanand |
| **14** | Visnagar |
| **15** | Porbander |
| **16** | Una |
| **17** | Upleta |
| **18** | Rajula |
| **19** | Himmatnagar |
| **20** | Vijapur |
| **21** | Kadi |
| **KARNATAKA** | |
| **1** | Haveri |
| **2** | Annigiri |
| **3** | Hubli |
| **4** | Gadag |
| **5** | Ranebenur |
| **6** | Santhesaragur |
| **7** | Chitrudurga |
| **ORISSA** | |
| **1** | Ramanguda |
| **2** | Gunupur |
| **3** | Rayagada |
| **4** | Utkela |
| **5** | Maniguda |
| **6** | Patakiagarh, Jogimunda |
| **7** | Parlakhemundi |

| S. No. | APMC Market Yard |
|---|---|
| **8** | Digapahandi |
| **9** | Karlapada, Dungriguda |
| | **PUNJAB** |
| **1** | Rampura phul |
| **2** | Jaitu, |
| **3** | Lehragaga |
| **4** | Tappa |
| **5** | Bareta |
| **6** | Barnala |
| **7** | Sardulgarh |
| **8** | Bhatinda |
| **9** | Giddarbha |
| **10** | Goniana |
| | **RAJASTHAN** |
| **1** | Sri Ganganagar |
| **2** | Hanuman garh |
| **3** | Rawatsar |
| **4** | Srikaranpur |
| **5** | Khajuwal |
| **6** | Bijaj Nagar |
| **7** | Sri Bijaj Nagar |
| | **MAHARASHTRA** |
| **1** | Balapur |
| **2** | Amaravati |
| **3** | Narkhed |
| **4** | Dhamangoan |
| **5** | Bhiwapur |
| **6** | Tiwsa |
| **7** | Akot |
| **8** | Nagpur |
| **9** | Yavatmal |
| **10** | Jalna |
| **11** | Pachora |
| **12** | Khangaon |
| **13** | Murtija pur |
| **14** | Darayapur |
| **15** | Akola |
| **16** | Warad |
| **17** | Morshi |
| **18** | Beed |
| **19** | Mnandgoan |

| S. No. | APMC Market Yard |
|---|---|
| **20** | Nerparsopant |
| **21** | Dhule |
| **22** | Kalameshwar |
| **23** | Achalpur |
| **24** | Amravati |
| **25** | Parshioni |
| **HARYANA** | |
| **1** | Barwala |
| **2** | Tohana |
| **3** | Adampur |
| **4** | Uklana |
| **5** | Bhattukalan |
| **6** | Kallanwali |
| **7** | Ellanabad |
| **8** | Sirsa |
| **9** | Ding |
| **10** | Julna |
| **MADHYA PRADESH** | |
| **1** | Jhabua |
| **2** | Khetia |
| **3** | khargoan |
| **4** | Sausar |
| **5** | Bhikangaon |
| **6** | Jobat |
| **7** | Manawar |
| **8** | Sanawad |
| **9** | Badnawar |
| **10** | Sailana |
| **11** | Burhanpur |
| **12** | Thandla |
| **13** | Ratlam |
| **14** | Dhamnod |
| **ANDHRA PRADESH** | |
| **1** | Pedda nandhi |
| **2** | Pidgaurulla |
| **3** | Chilakuripet |
| **4** | Macherla |
| **5** | Nandhigama |
| **6** | Karim nagar |
| **7** | Kanchikacherla |
| **8** | Tadikonda |

| S. No. | APMC Market Yard |
|---|---|
| **9** | Pedda pally |
| **10** | Enumoula, Warahad |
| **11** | Sattenapalli |
| **12** | Jaggayapet |
| **13** | Mylavaram |
| **14** | Jammi kunta |
| **15** | Thirum alagiri |
| **16** | Parkal ,Warangal |
| **17** | Vemula wada |
| **18** | Bhainsa |
| **19** | Natiraikal |
| **20** | Devara konda |
| **21** | Chopadandi |
| **22** | Janagon |
| **23** | Krosoou |
| **24** | Markapur |
| **TAMIL NADU** | |
| **1** | Tiruppur |
| **2** | Villupuram |
| **3** | Moolanur |
| **4** | Annur |

## Annexure 3: List of TMC G & P factories covered during the primary survey

| S. No. | Name |
|---|---|
| | **GUJARAT** |
| **1** | Shri Geeta Ginning & Oil Industries, Morbi |
| **2** | Krushna Industries Cotton Ginning Industries, Wankaner |
| **3** | Shree Ganesh Cotton G & P Factory, Hadmtala |
| **4** | Savalia G & P (P) Ltd., Shapar-Virval |
| **5** | Narendra Cotton G & P Co.(P) Ltd., Rajkot |
| **6** | Faiz Industries, Manavadar |
| **7** | Sahyog Cotton And Oil Industries, Shapar |
| **8** | Priyesh Cotton (P) Ltd., Shapur |
| **9** | Sipai Cotton Industries, Wankaner |
| **10** | Bharat Industries, Wankaner |
| **11** | Shreenathji Cotton Industries, Jasdan |
| **12** | Laxminarayan Cotton Industries, Tankara |
| **13** | Amit Cotton Industries, Shapar |
| **14** | National Cotton Industries, Shapar |
| **15** | Raghuvanshi Industries, Taragadi |
| **16** | Raghuvir Cotton G & P Pvt.Ltd., Rajkot |
| **17** | K.V. Cotton Ginning & Pressing Co. Pvt. Ltd.,Taraghadi |
| **18** | Bharat Ginning & Pressing Factory, Jasdan |
| **19** | Radheshyam Fibers Pvt.Ltd., Hadamtala |
| **20** | Gujarat Ginning & Oil Industries, Rajkot |
| **21** | Jaydeep Cotton Fibres Pvt Ltd., Shapar |
| **22** | Uma Cotton & Oil Industries, Tankara |
| **23** | Shree Paresh Ginning & Pressing Factory, Kuvadva |
| **24** | Bajrang Cotgin Pvt. Ltd., Targhadi |
| **25** | Madhav Cotton Industries, Shapar |
| **26** | Raghuvir Cotex Pvt. Ltd., Gondal |
| **27** | Shree Ramkrushna Ginning and Oil Industries, Tankara |
| **28** | Galaxy Cotton and Textiles Pvt. Ltd., Shapar |
| **29** | Patel Cotton Industries, Mehsana |
| **30** | Gokul Industries, Targhadi |
| **31** | Dariyalal Industries, Chandrapur |
| **32** | Giriraj Ginning & Pressing (Pvt.) Ltd., Gondal |
| **33** | Shri Yogi Ginning & Pressing Factory, Jasdan |
| **34** | Vikas Industries, Manavadar |
| **35** | C.K. Industries, Kuwadva |
| **36** | Ashirwad Ginning & Pressing Factory, Hadamtala |
| **37** | Royal Ginning Factory, Shapar |
| **38** | Devdeep Cotton Industries, Hadamtala |

| S. No. | Name |
|---|---|
| **39** | Kuldeep Cotton Industries, Tankara |
| **40** | Rahguvanshi Cotton Ginning & Pressing Pvt. Ltd., Taragadi |
| **41** | S.K. Cotton Pvt. Ltd., Gondal |
| **42** | Shri Raghuvir Cotton & Oil Industries, Targhadi |
| **43** | Radhe Enterprise, Shapar |
| **44** | Amrut Cotton Industries, Gondal |
| **45** | Shree Ram ginning & pressing industries, Kagvad |
| **46** | Tirupati Cotton, Shapar |
| **47** | Kailash Ginning & Pressing Pvt. Ltd., Kotda |
| **48** | Avirat Cotton Industries, Gondal |
| **49** | Moti Industries, Shapar |
| **50** | Meera Cotton & Oil industries, Tankara |
| **51** | Jagnath Cotton Ginning and Pressing Pvt. Ltd., Targhadi |
| **52** | Riddhi Siddhi Cotton Ginning & Pressing Pvt. Ltd., Paddhari |
| **53** | Ajanta Ginning & Pressing Industries, Ajanta Industrial, Tankara |
| **54** | Banshi Cotton Pvt. Ltd., Padadhar |
| **55** | Shivshakti Ginning Factory, Jasdan |
| **56** | Madhav Ginning & Pressing Pvt. Ltd., Jasdan |
| **57** | Royal Cotton Industries, wankaner |
| **58** | Dhruv Cotton Processing Pvt. Ltd., Atkot |
| **59** | Bhoomi Ginning & Pressing Pvt. Ltd., Atkot |
| **60** | R.V. Cotex, Paddhari |
| **61** | Shri Giriraj Ginning Factory, Jasdan |
| **62** | B.H. Cotton Pvt. Ltd., Tankara |
| **63** | Patel Cotton, Shapar |
| **64** | Balaji Cotton Industries, Manvadar |
| **65** | Tribhuvan Industries, Kadi |
| **66** | Gokuldas Pragji Ginning & Pressing Factory, Morbi |
| **67** | Shalibhadra Cotgin (P) Ltd., Gondal |
| **68** | Tirupati Ginning & Pressing Factory, |
| **69** | Shyam G & P (P) Ltd., Mahuva |
| **70** | Sadguru Cotton (P)Ltd., Morbi |
| **71** | Raviraj Ginning Pressing & Oil Industry, Morbi |
| **72** | Gujarat G & P Co., Gundala |
| **73** | Jay Jalaram, Cotton Industries, Gondal |
| **74** | Lakshmi Cot-Gin Pvt. Ltd., Gondal |
| **75** | Shubhlaxmi Industries, Tankara |
| **76** | Somnath Cottgin (I) Pvt. Ltd., Tankara |
| **77** | Raiyani Cotton Industries, Tankara |
| **78** | Jayashri Finning & Spinning Associates, Jetpur |
| **79** | Kishan Cotton Oil Industries, Tankara |

| S. No. | Name |
|---|---|
| **80** | Ramkrupa Ginning & Pressing Pvt. Ltd., Gondal |
| **81** | Om Cotton Pvt. Ltd. Survey, Gondal |
| **82** | Madhav Ginning & Pressing Pvt. Ltd., Jasdan |
| **83** | Sahajanand Cotton Industries, Gondal |
| **84** | White Gold Cotton Industries, Nagadka |
| **85** | Kishan Industries, Bhunava |
| **86** | Ramvijay Cotton Mills Pvt. Ltd., Jasdan |
| **87** | Classic Cotton Pvt. Ltd., Gondal |
| **88** | Siddhi Vinayak Cot-gin Pvt. Ltd., Gondal |
| **89** | Jaydeep Cotton Fibres Pvt Ltd., Shapar |
| **90** | Sadguru Cotton Pvt. Ltd., Rajpar |
| **91** | Shree Govardhan Cot-Gin Pvt. Ltd., Gondal |
| **92** | Shri Ram Cotton Industries, Mahuva |
| **93** | Sunrise Gng. Pvt. Ltd., Gondal |
| **94** | Kavan Cotton Industries, Rajkot |
| **95** | Tirupati Oil Industries, Kadi |
| **96** | Mahadevi Cotton Industries, Kadi |
| **97** | Cot Industries, Kadi |
| **98** | Shree Ram Cotton Industries, Mehsana |
| **99** | Satyam Cotton Industries, Kadi |
| **100** | Suraj Cotton, Ranasan |
| **101** | New Kodiyar Cotton Co., Sawala |
| **102** | Shree Jay Ambe Industries, Visnagar |
| **103** | Shree Radheyshyam Ginning Factory, Kadi |
| **104** | Uday Cotton Industries,Irana Road, Kadi |
| **105** | Shree Umiya Cotton Industries, Vijapur |
| **106** | Pashupati Cotton Industries, Kadi |
| **107** | Laxmi Cotton Industries, Vijapur |
| **108** | Patel Cotton Industries, Mehsana |
| **109** | Parvati Cotton Industries, Vijapur |
| **110** | Tirupati Industries, Mehsana |
| **111** | Shree Ramdev Cotton Industries, Vijapur |
| **112** | Dhanlaxmi Industries, Mehsana |
| **113** | Jalaram Cotton Industries, Vijapur |
| **114** | Vaibhav Laxmi Industries Ltd., Kadi |
| **115** | Krishna Natural Fibres Pvt.Ltd., Kadi |
| **116** | Malguru Industries, Nanikadi |
| **117** | Amul Cotton Industries, Kadi |
| **118** | Kum Kum Cotton Industry, Kadi |
| **119** | Shivshakti Ginning & Pressing Factory, Kadi |
| **120** | Shiv Cotton Industries, Vijapur |

| S. No. | Name |
|---|---|
| **121** | Shri Ganapathy G & P Industry, Kadi |
| **122** | Jagdish Cotton Industries, Kadi |
| **123** | Keshav Cotton Industries, Kadi |
| **124** | Amivarsha Industries, Nanikadi |
| **125** | Shree Bhagyoday Oil Mill & G & P Factory, Nanikadi |
| **126** | Ambesh Ginning and Oil Industries, Nanikadi |
| **127** | Rajeshwari Ginning & Pressing Factory, Kadi |
| **128** | Vivekanada Industries, Kadi |
| **129** | Ashwamegh Industries, Kadi thor |
| **130** | Shanta Cotton Industries (P) Ltd., Kadi |
| **131** | Vaibhav Industries, Nanikadi |
| **132** | Harsiddh Industries, Rangpurda |
| **133** | Yogi Industries, Kadi |
| **134** | Sardar Industries, Rangpurda |
| **135** | Shri Ramkrishna Oil Industries, Nanikadi |
| **136** | Mamta Cotton Industries, Rangpurda |
| **137** | Pragati Cotton Industries, Kadi |
| **138** | Amar Ginning Factory, Pirojpur |
| **139** | Jay Umiya Industries, Nanikadi |
| **140** | Murlidhar Oil Mills & Ginning Factory, Nanikadi |
| **141** | Shankar Oil Mill & Ginning Factory, Kadi |
| **142** | Nilkanth Industries, Kadi |
| **143** | Shankar Parvati Industries, Borisana |
| **144** | Janki Oil Industries, Budasan |
| **145** | Kokila Cotton Industries, Veejapur |
| **146** | Gangadhar Pressing Factory, Kadi |
| **147** | Siddhi Cotton Industries, Vijapur |
| **148** | Shakti Cotton Industries, Vijapur |
| **149** | Vikas Cotton Industries,Cotton Ginning & Pressing, Rampurda |
| **150** | Avadh Cotton Industries, Kadi |
| **151** | Bhoomi Industries, Rangpurda |
| **152** | Shiv Cotton Industries, Kadi |
| **153** | Kedar Cotton Industries,Budasan |
| **154** | G.B. Cotton Industries, Kadi-Thol |
| **155** | Sainath Cotton Industries, Vijapur |
| **156** | Shubham Industries,Ankhol |
| **157** | P.B. Cotton Industries, Khanusa |
| **158** | Shree Ganesh Oil Mill & Ginning Factory, Kadi |
| **159** | Shri Krishna Cotton Industries, Vijapur |
| **160** | Gopal Cotton Industries, Karannagar |
| **161** | Suvidha Cotton Ltd., Ankhol |

| S. No. | Name |
|---|---|
| **162** | Mahesh Oil Industries, Kadi |
| **163** | Shivani Cotton (P) Ltd., Rangpurda |
| **164** | Dev Cot Industries, Rangpurda |
| **165** | Jay Prabhu Cotton Industries, Vijapur |
| **166** | Muralidhar Industries, Kotadi |
| **167** | J.B. Cotton Industries, Kotadi |
| **168** | Ganga Cotton Industries, Vijapur |
| **169** | Kuvarba Cotton Industries, Pilvai |
| **170** | Shree B.V. Oil Industries, Indrad |
| **171** | Yogeshwar Cotton Industries, Pilvai |
| **172** | Gajalaxmi Cotton industries, Rangpurda |
| **173** | Balaji Industries, Pilvai |
| **174** | Amrut Cotton Industries, Ladol |
| **175** | K.Z. Cotspin India Ltd., Pilvai |
| **176** | Omkar Cotton Industries, Khanusa |
| **177** | Vaishnavi Cotton Industries, Thol Road |
| **178** | Patel Cotton Industries, Padadhari |
| **179** | Shreenath Cotton Industries, Kadi |
| **180** | Shree Krishna G & P Factory, Kadi |
| **181** | Rajeshwari Ginning Factory, Nanikadi |
| **182** | Balaji Oil Mill Ginning & Pressing, Mahuva |
| **183** | Vrajbhoomi Cotton Industries, Mahuva |
| **184** | Asha Cotton Industries, Ginning Pressing Oil Mill, Mahuva |
| **185** | Jalaram Cotton Industries, Mahuva |
| **186** | Madhuvan Cotton Pvt. Ltd., Mahuva |
| **187** | Yadunandan Cotton Pvt. Ltd., Mahuva |
| **188** | Shree Ram Cotton Industries, Mahuva |
| **189** | Gopnath Cotton (P) Ltd., Talaja |
| **190** | Gokul Cotton Pvt. Ltd., Mahuva |
| **191** | Chamunda Cotton (P) Ltd., Talaja |
| **192** | Tirupati Ginning & Pressing Pvt. Ltd., Mahuva |
| **193** | Asha Cotex, Vadli |
| **194** | Shree Patel Mill G & P Merchant, Kotharia |
| **195** | Maradia Ginning & Pressing (P) Ltd, Mitadi Road |
| **196** | Kuldip G & P (P) Ltd., Mitadi Road, Manavadhar |
| **197** | Mayur G & P (P) Ltd., Mitadi Road, Manavadhar |
| **198** | Raghav Industries, Manavadhar |
| **199** | Giriraj Industries, Manavadhar |
| **200** | Chandan G & P Factory, (P) Ltd., Manavadhar |
| **201** | Balaji Cotton Industries, Manavadhar |
| **202** | Nutan Cotton G & P Factory, Manavadhar |

| S. No. | Name |
|---|---|
| **203** | Krishna Ginning & Pressing Factory, Manavadhar |
| **204** | Patel Cotton Processing Co., Manavadhar |
| **205** | Vikas Cotton Industries, Manavadar Road, Mitadi |
| **206** | Ashirwad Ginning Factory, Mitadi Road, Manavadhar |
| **207** | Tirumala Cotton Industries, Manavadhar |
| **208** | Reva Industries, Manavadar |
| **209** | Radheyshyam Cotton Industries, Manavadhar |
| **210** | Vardhaman Industries, Manavdhar |
| **211** | Patel Enterprises, Manavdhar |
| **212** | Sunlight Cotton Industries, Mitadi |
| **213** | Jaldhara Ginning & Pressing Factory, Manavadhar |
| **214** | Paradise Cotton Industries, Manavadhar |
| **215** | Kishan Cotton Industries, Manavadhar |
| **216** | Arihant Cotton Industries, Mitadi |
| **217** | Shree Gunatit Ginning Factory, Manavadhar |
| **218** | Lalit Cotton, Manavadhar |
| **219** | Agarwal Cot Spin (P) Ltd. Cotton, Modasa |
| **220** | Hariom Ginning Industries, Pavijetpur |
| **221** | Shree Jagadamba Cotton G & P Factory, Handod |
| **222** | Abdul Rahim Pirbhai & Co., Bodeli, |
| **223** | Rajkiran Cotton Industries, Karjan |
| **224** | Shraddha Cotton Industries, Chachak |
| **225** | Ambica Cotton Industries, Godavari |
| **226** | Gopinath Cotton (P) Ltd., Dhrangadhra |
| **227** | Milan Ginning & Pressing (P) Ltd., Limbdi |
| **228** | AMI Industries, Chuda |
| **229** | Shree Gopinath G & P Factory, Muli |
| **230** | Shakti Cotton Industries, Shekhpur, Surendranagar, |
| **231** | Shri Krishna Ginning & Oil Industries, Rajpar |
| **232** | Nilkanth Cotton Industries, Dhrangadhara, |
| **233** | Shree Jaydeep Ginning Factory, Dhrangadhra |
| **234** | Radhika Ginning Factory, Sara |
| **235** | Maruti Ginning Factory, Sarla |
| **236** | Mandal Group Co-op. Cotton Sale, Mandal |
| **237** | Shri Uma Ginning Pressing Pvt. Ltd., Sokali |
| **238** | Tulja Cotton G & P Factory, Bhojwa |
| **239** | Krishna G & P P. Ltd., Manavadhar |
| **240** | Rajeshwari Cotton Processors Pvt. Ltd., Bhojwa |
| **241** | Umiya Cotton Processors (Gujarat) Pvt. Ltd., Hansalpur |
| **242** | Shreeji Cotton Industries, Hansalpur |
| **243** | Navbharat Industries, Bhojwa |

| S. No. | Name |
|---|---|
| **244** | Vishal Industries, Dholka |
| **245** | Dhandhuka Ranpur Cotton Processor Pvt Ltd., Kinar |
| **246** | Arihant Industries, Dholka |
| **247** | Balram Cotton Industries, Dholka |
| **248** | Dharti cotton Industries, Babra |
| **249** | Hanuman Cotton Industries, Savarkundla |
| **250** | Narayan Cotgin Corporation, Amreli |
| **251** | Radhika Cotex Pvt Ltd, Charkha |
| **252** | Rameshwar Cotton Industries, Badhada |
| **253** | Sitaram Cotton Industries, Rajula |
| | **ANDHRA PRADESH** |
| **1** | Sri Ram industries, Adilabad |
| **2** | Sindhu ginning & pressing factory, Adilabad |
| **3** | GM Rao cotton Pvt. Ltd., Adilabad |
| **4** | Sri Jagdamba Ginning & pressing Pvt. Ltd., Adilabad |
| **5** | Kamala Ginning & oil industries, Bhainsa |
| **6** | Tirumala cotton & agro products Pvt. Ltd., Guntur |
| **7** | DPM TEXTILES Ltd., Guntur |
| **8** | Maheshwari Industries, Adilabad |
| **9** | Saibaba G & P Factory, Adilabad |
| **10** | Srivenkatesh G & P factory, Adilabad |
| **11** | Mahadev sitaram cotton mill(india) pvt.ltd , Bhainsa |
| | **KARNATAKA** |
| **1** | Shree Guru Raghavendra Cotton, Bellary |
| **2** | Sri Guru Kari Basaweshwar Swamy G & P, Ranibennur |
| **3** | Sri mahalaxmi ginning factory, Raichur |
| **4** | Ravindra Babu Spinning, Bellary |
| **5** | Shri Rajendra Ginning Factory, Haveri |
| **6** | Veerchand Naranji Enterprises, Tarihal |
| **7** | Cot Gins And Cot Press, Hubli |
| | **MADHYA PRADESH** |
| **1** | Vikas ginning and processing pvt. Ltd., Barwaha |
| **2** | Rajender rishab ginning & pressing pvt, ltd, Ratlam |
| **3** | Rahul cotton factory, Khargone |
| **4** | Dlight cotton,pvt,ltd , Dhar |
| **5** | Satkar industries pvt,ltd., Dhar |
| **6** | Abhay raj industries, Maheshwar |
| **7** | Shah gover dhan,bhikari das, Burhanpur |
| **8** | Pavan cotton fibers, warla road, Sendhwa |
| **9** | SMO industries, Khargone |
| **10** | Raj Eco farms, Khargone |

| S. No. | Name |
|---|---|
| **11** | Nirmal natural fiber, Bhikangaon |
| **12** | Sanjay cotton fiber, Anjad |
| **13** | Prakash export, Bagod |
| **14** | Goldy fin agro cotton, Dhar |
| **15** | Maikal bio-rs-(1) ltd , Dongargaon |
| **16** | Tirupati industries, Dewas |
| **17** | Rajeshree fibers, Khargone |
| **18** | Narendra Industries , Burhanpur |
| **19** | Shriram cotton industries , Dewas |
| **20** | Rahul industries, Sanawad |
| **21** | Pashupatinath Fibers Industrial Area, Khargone |
| **22** | Prashant ginned cotton pvt ltd , Pandhurn |
| **23** | Vikas Ginning, Barwaha |
| | **ORISSA** |
| **1** | Konark Cotton Growers Co-op SPG mills Ltd, Kalahandi |
| **2** | Pratima Agro & paper pvt ltd, Titligarh |
| **3** | Om Organic Cotton Pvt Ltd, Balangir |
| **4** | Jay Durga Ginning Mills Pvt Ltd, Bolangic Industrial Estate, Kurli |
| **5** | Ambika Agro industries Pvt. Ltd., Balangir |
| **6** | Kamdhenu Ginning Mills, Rayagada |
| | **PUNJAB** |
| **1** | Shree Ganesh Cotton Industries, Muktsar |
| **2** | Vinayak Cotton Ginning & General Mills, Barnala |
| **3** | Aggarwal Cotton Company, Bathinda |
| **4** | Jagdambe Cotton Textile Mill, Budhlada |
| **5** | Bharat Cotton Factory, Gidharbaha |
| **6** | Jai Bhagvati Enter Prices Cotton, Rampura |
| | **MAHARASHTRA** |
| **1** | S.S. Ginning & Pressing Pvt. Ltd, Balapur |
| **2** | J.S. Cotton Industries, Barshi |
| **3** | Shri Sant Gadge Maharaj Sahakari Soot Girni Ltd., Akola |
| **4** | Shakabari Ginning & Pressing Factory, Akola |
| **5** | Shri Radhakrishna Ginning & Pressing Factory, Kanshivani |
| **6** | Wattamwar G & P Factory, Jintur |
| **P** | Jai fibres, Chopda |
| **8** | Sultania Oil Industries Pvt. Ltd, Kalmeshwar |
| **9** | Bachehraj Factories (P) Ltd, Wardha |
| **10** | Paras Cotton Industries, Madhali |
| **11** | Shriniwas Ginning Industries, Wardha |
| **12** | Wasudeo Pressing Factory, Seloo |
| **13** | Sagar Fibres Pvt. Ltd., Yavatmal |

| S. No. | Name |
|---|---|
| **14** | Jai Kiran Prabhaji Ginning & Pressing Factory, Aurangabad |
| **15** | Manjeet Ginning Factory, Georai |
| **16** | Indira Cotton Processors, Wani |
| **17** | Amrut Ginning Pvt. Ltd., Jalgaon |
| **18** | The Chunilal Motiram Ginning Factory, Pachora |
| **19** | Arihant Cotton G & P Factory, Yawal |
| **20** | Matoshri Ginning & Pressing Factory, Bhadgaon |
| **21** | Babanlal Bhikulal Fibers Pvt. Ltd., Raver |
| **22** | Ram Food Products Pvt. Ltd., Dharangaon |
| **23** | Tirupati Ginning Industries, Pachora |
| **24** | Ashirwad Ginning & Pressing Factory, Bhadgaon |
| **25** | Laxmi Ginning & Pressing Factory, Avhane |
| **26** | Satyam Cotex pvt. Ltd., Chalisgaon |
| **27** | Shree Krishna Ginning & Pressing Factory, Seloo |
| **28** | Shri krishna Ginning & Pressing Factory, Deoli |
| **29** | Jay Bajrang Agro Processing (P) Ltd., Deoli |
| **30** | Indira Sahakari Soot Girni Ltd., Wardha |
| **31** | Girija Shankar Cotton Pvt. Ltd., Beed |
| **32** | Bihani Binayake Cotex (P) Ltd., Parbhani |
| **33** | S. R. Cotton, Beed |
| **34** | Arihant Agrotech Ginning & Pressing Factory, Buldhana |
| **35** | Shree Changapur Hanumanji G & P Factory, Amravati |
| **36** | Shah Govardhandas G & P Factory, Dharangaon |
| **37** | Geeta Ginning & Pressing Industries, Dhulepin |
| **38** | Padmavati Ginning & Pressing Pvt. Ltd., Dhule |
| **39** | Narayandas Chunilal Ginning & Pressing Factory, Jalna |
| **40** | Khurana Ginning & Pressing Industries, Yavatmal |
| **41** | Manilal Manekji (P) Ltd., Akot |
| **42** | Rajiv Sahakari Soot Girni Maryadit, Baherpura |
| **43** | Daryapur Shetkari Sah.G & P Factory, Daryapur |
| **44** | Jadhao Cotex, Nandgam |
| **45** | Jayguru Cotton Processors, Akola |
| **46** | Shivam Ginning & Pressing Pvt.Ltd, Nandurbar |
| **47** | M.A.Sachchiyay Agro Pvt.Ltd., Malkapur |
| **48** | Agrawal Ginning and Pressing, Jalgaon |
| **49** | Om Shankar Agro Mills Ltd. Tank Road, Khamgaon |
| **50** | Rajeshree Cotex,Jamner Rd, Pahur, Jamner |
| **51** | Godavari Cotton Industries, Aurangabad |
| **52** | Kunal Cotton Industries, Beed |
| **53** | Radhika Ginning & Pressing Factory, Parbhani |
| **54** | B.R. Cotton, Beed |

| S. No. | Name |
|---|---|
| **55** | Shreekant Cotton Industries, Akola |
| **56** | Vijay Agro Industries, Yavatmal |
| **57** | Sow.Padmabai S. Sanghavi G & P Factory, Pachora |
| **58** | Dayal Cotton Mills Ltd., Yeotmal |
| **59** | Kala Seeds Processing Plant, Dist.Wardha |
| **60** | Shri Laxmi Venkatesh Cotton G & P Factory,Majalgaon |
| **61** | Shram Vardhini Ginning & Pressing Pvt. Ltd, Bodwad |
| **62** | Bajaj Ginning Factory, Yavatml |
| **63** | Ruhatiya Cotton and Metal (P) Ltd., Patur |
| **64** | Radhekrishna Cot gin Pvt.Ltd.,Dhule |
| **65** | R.S.R. Mohota Ginning & Pressing Factory, Hinganghat |
| **66** | Raghvendra Ginning & Pressing Factory, Parbhani |
| **67** | Rajratna Cottex Industries, Dhule |
| **68** | Yoganand G & P Factory, Beed |
| **69** | Padmavati Extraction Pvt. Ltd. Dhule |
| **70** | Shree Supo Ginning & Pressing Factory, Buldhana-443402 |
| **71** | Nagarwala Enterprises, Yavatmal |
| **72** | Kisan Cotex, Aurangabad |
| **73** | Lalani Cotton Industries, Wadki |
| **74** | Sunil Ginning Factory, Erandol |
| **75** | Mahesh Industries, Parbhani |
| **76** | Radhalaxmi Ginning and Pressing, Jalna |
| **77** | Shrinath Industries, Katol |
| **78** | Shreeji Ginning and Pressing Factory, Dharangaon |
| **79** | Jawahar Sahkari Soot Girni Ltd., Dhule |
| **80** | Sri Rajendra Fibres, Aurangabad |
| **81** | Balaji Ginning & Pressing, Yavatmal |
| **82** | Prasad Cotton Industrie, Georai |
| **83** | Radhika Cotton, Nandurbar |
| **84** | Dhandeep Ginning Pressing Industries, Dhule |
| **85** | Gajanan Ginning & Pressing Factory, Pachora |
| **86** | Shrikrupa Ginners Pvt. Ltd., Emadol |
| **87** | Shubham Cotex, Parli |
| **88** | Shri Balaji Ginning & Pressing Factory, Aurangabad |
| **89** | Krishna Cotton, Dharangaon |
| **90** | Khatkeshwarbaba Ginning and pressing Factory, Jalna |
| **91** | Anurag Warehousing & Agro Processing, Beed |
| **92** | Shri Sheshnarayan G & P Factory, Jalna |
| **93** | Vallabh Industries, Dharangaon |
| **94** | Ashutosh Agro Industries, Malkapur |
| **95** | Mahalaxmi Ginning & Pressing, Beed |

| S. No. | Name |
|---|---|
| **96** | Gopal Krishna Udyog, Nandurbar |
| **97** | Jai Ambica Ginning & Pressing Factory, Jalna |
| **98** | Arihant Industries, Aurangabad |
| **99** | Siddartha Ginning & Pressing, Aurangabad |
| **100** | Ashirwad Cotex, Bhadgaon |
| **101** | Reddy Ginning & Pressing Factory, Yavatmal |
| **102** | Vikas Udyog, Parbhani |
| **103** | B.G. Cotex, Jalna |
| **104** | Suraj Cotex, Jalna |
| **105** | Swastik Ginning & Pressing Factory, Zari |
| **106** | Saibaba Cotton & Oil Industries, Beed |
| **107** | Laxminarayan Ginning & Pressing Factory Pachora |
| **108** | Shri Sudarshan Cotton Industries (P) Ltd., Wardha |
| **109** | Vishwananth Ginning Factory, Jalgaon |
| **110** | Somani Ginning & Pressing Factory, Dist.Jalna |
| **111** | Vidarbha Ginning & Pressing, Yavatmal |
| **112** | Narendra G & P, Parshivni |
| **113** | Balaji cotton G & P Indusstries, ,Amravati |
| **114** | Rakhi Industries G & P, Beed |
| **115** | Khatri cotton G & P industries, Wardha |
| **116** | Rajshree G & P ltd, Buldhana |
| **117** | Agrawal cottex, Aurangabad |
| **118** | Om Shree G & P PVT ltd, Jalgaon |
| **119** | Shree G & P factories, Jalgaon |
| **120** | Santosh Cotton Mill, Amravati |
| **121** | Tirupati cotton Industries Ltd, Paratwada |
| **122** | Arun Ginning & pressing Ind Ltd, Anjagaon-Surji |
| **123** | Jinmata Commercials Pvt. Ltd., Amravati |
| **124** | Jayramdas Bhakchand Industry, Dhamangaon |
| | **HARYANA** |
| **1** | Super Agro Industries, Sirsa |
| **2** | Super Agro Industries, Sirsa |
| **3** | Linkoln Industries Ltd, Fatehabad |
| **4** | Sharda Cotton Factory, Sirsa |
| **5** | Aditya Agro Industry, Sirsa |
| **6** | Bhatat Foods Pvt Limited, Jind |
| | **TAMIL NADU** |
| **1** | Royal Classic Mills, Dindigal |
| | **DIU** |
| **1** | Diu Cotton Industries |

## Annexure 4: Yearly trend in cotton arrivals in select Market Yards

| State - Gujarat | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Jetpur** | 2004-05 | 49365 | 2005-06 | 106074 | 2007-08 | 161087 | 2008-09 | 172819 |
| **Visnagar** | 2000-01 | 254890 | 2001-02 | 280500 | 2003-04 | 288000 | 2004-05 | 302000 |
| **Gadhada** | 2004-05 | 332000 | 2005-06 | 340000 | 2007-08 | 377000 | 2008-09 | 482000 |
| **Jamnagar** | 2005-06 | 38910 | 2006-07 | 41000 | 2008-09 | 55300 | 2009-10 | 54000 |

| State - Maharashtra | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Dhule** | 2003-04 | 20123 | 2004-05 | 18759 | 2006-07 | 15262 | 2007-08 | 25532 |
| **Yavatmal** | 2001-02 | 23198 | 2002-03 | 13527 | 2004-05 | 29372 | 2005-06 | 37533 |
| **Pachora** | 2000-01 | 53000 | 2001-02 | 68700 | 2003-04 | 75450 | 2004-05 | 73253 |
| **Kalameshwar** | 2005-06 | 62831 | 2006-07 | 66567 | 2008-09 | 94332 | 2009-10 | 114365 |

| State - Madhya Pradesh | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Manawar** | 2002-03 | 11375 | 2003-04 | 15348 | 2005-06 | 23373 | 2006-07 | 39252 |
| **Dhamnod** | 2000-01 | 15373 | 2001-02 | 13521 | 2003-04 | 19789 | 2004-05 | 22315 |
| **Burhanpur** | 1998-99 | 13289 | 1999-00 | 9275 | 2001-02 | 25081 | 2002-03 | 31308 |
| **Jobat** | 2006-07 | 29214 | 2007-08 | 23424 | 2009-10 | 30615 | 2010-11 | 47294 |

| State - Andhra Pradesh | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Marakpur** | 2003-04 | 18740 | 2004-05 | 29500 | 2006-07 | 42600 | 2007-08 | 38950 |
| **Nandigama** | 2000-01 | 86000 | 2001-02 | 95000 | 2003-04 | 110646 | 2004-05 | 142416 |
| **Peddapally** | 2004-05 | 170000 | 2005-06 | 189201 | 2007-08 | 202899 | 2008-09 | 488322 |

| State - Karnataka | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Haveri** | 2005-06 | 110605 | 2006-07 | 223963 | 2008-09 | 437097 | 2009-10 | 485500 |
| **Annegeri** | 2001-02 | 30157 | 2002-03 | 35204 | 2004-05 | 49330 | 2005-06 | 36264 |
| **Chitradurga** | 2005-06 | 153010 | 2006-07 | 153368 | 2008-09 | 240210 | 2009-10 | 251079 |

| State - Orissa | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Parlakhemundi** | 2005-06 | 6580 | 2006-07 | 7795 | 2008-09 | 8654 | 2009-10 | 9956 |
| **Jogimunda** | 2000-01 | 6500 | 2001-02 | 7800 | 2003-04 | 9000 | 2004-05 | 11750 |
| **Muniguda** | 2005-06 | 8000 | 2006-07 | 9500 | 2008-09 | 14415 | 2009-10 | 10718 |

| State - Punjab | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Lehergaga** | 2005-06 | 55662 | 2006-07 | 71911 | 2008-09 | 85873 | 2009-10 | 77865 |
| **Bareta** | 2004-05 | 174029 | 2005-06 | 181644 | 2007-08 | 193434 | 2008-09 | 140530 |
| **Bhatinda** | 2003-04 | 128640 | 2004-05 | 276596 | 2006-07 | 371465 | 2007-08 | 370741 |

| State - Rajasthan | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Development | | | | After Development | | | |
| **Market Yard** | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) | Year 1 | Cotton arrivals (Quintals) | Year 2 | Cotton arrivals (Quintals) |
| **Sri ganganagar** | 1999-00 | 55955 | 2000-01 | 68750 | 2002-03 | 76800 | 2003-04 | 74000 |
| **Hanumangarh** | 2004-05 | 48690 | 2005-06 | 49500 | 2007-08 | 62964 | 2008-09 | 54982 |

## Annexure 5: Summary of ITMF contamination survey reports

| Particulars | 1997 | 1999 | 2001 | 2003 | 2005 | 2007 | 2009 |
|---|---|---|---|---|---|---|---|
| **Top ten most contaminated cottons** | 4 from India<br>3 from Pakistan<br>2 from Turkey<br>1 from Iran | 7 from India, 1 each from Pakistan, Turkey & Sudan | 6 from India, 1 each from Nigeria, Turkey, Tajikistan and Pakistan | 7 from India, 2 from Turkey and 1 from Uzbekistan | 5 from India, 2 from Turkey, and 1 each from Paraguay, Nigeria and Uzbekistan | 6 from India, 1 each from Togo, Turkey, Uzbekistan and Mali | 5 from India, 2 from Pakistan and 1 each from Egypt, Uzbekistan and Mali |
| **Indian entries among top ten most contaminated cottons** | F.414, H.4, LRA.5166, S-4/6 | DCH.32, H.4, F.414, J.34, LRA.5166, S.4/6, "India-Others" | H-4, LRA, Shankar-4/6, India-others, J-34, DCH | H-4, J-34, LRA, Shankar-4/6, India-others, DCH, MCU-5 | DCH, MCU-5, J-34, Shankar-4/6, India-others | H-4, LRA, Shankar-4/6, India-others, J-34, MCU-5 | H-4, Shankar-4/6, DCH, J-34, MCU-5 |
| **Top 29 least contaminated cottons** | None from India | None from India | None from India | None from India* | None from India [#] | None from India [@] | None from India [^] |

**Only top 23 samples were evaluated*
*[#]Only top 21 samples were evaluated*
*[@]Only top 16 samples were evaluated*
*^ Only top 14 samples were evaluated*

# Annexure 6: Cotton bales specification IS 12171:1999 (First Revision)

## 1. SCOPE

**1.1** This standard prescribes trash content, moisture regain and mass of bale of ginned cotton as well as the Requirements of material used for packing of bales.

## 2. REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| *IS NO.* | *Title* |
|---|---|
| 175:1989 | Sheeting, tickings and bedsheets - Specification (*third revision*) |
| 1029:1970 | Hot rolled steel strip (bailing) (*first revision*) |
| 2818 (Part 3:1971) | Indian hessian: art 3 – 213 and 270 g/m$^2$ at 16 percent contract regain (*first revision*) |
| 4871:1968 | Method for determination of lint and trash content of cotton by means of mechanical-Pneumatic machines |
| 4952:1968 | Methods for sampling of cotton bales, silvers and rovings |

## 3. CLEANING

If necessary, the *kapas* may be pre-cleaned suitably before ginning. In case of excessive trash in *kapas*, a lint cleaner may be used after ginning and before pressing.

## 4. REQUIREMENTS

### 4.1 Ginned cotton in Pressed Bales

**4.1.1** *Trash Content*

The maximum trash content (excluding invisible loss) for various categories of cotton shal be as under when tested by the method prescribed in IS 4871:

a) Extra-long staple (32.5 mm and above)- 3 percent
b) Long and superior medium staple (27.5 to 32.0 mm and 25 to 27 mm) – 5 percent
c) Medium and short staple (including Bengai Deshi)(20.5 to 4.5 mm and 20 mm and less)- 6 percent
d) CJ-73, V-797, Kalagin, Waghad and similar closed boll cotton- 10 percent

**4.1.2** *Moisture Regain*

The moisture regain of ginned cotton in the pressed bale shall not exceed 8.5 percent.

### 4.2 Ginned cotton in Pressed Bales

**4.2.1** *Dimensions*

The recommended nominal dimensions of the banded bales (full pressed) are given below:

| *Length* mm | *Width* mm | *Height* mm |
|---|---|---|
| 1060 | 530 or | 780 |
| 1400 | 530 or | 700 |
| 1240 | 480 | 480 |

**4.2.2** *Mass (Weight)*

The mass of bale shall be 170 kg subject to a tolerance of ± 10 kg throughout the season except for V-797, Kalagin, CJ-73 and Waghad varieties of cotton in which case the mass of bale shall be 155 kg. However, a tolerance of ± 7 kg on 155 kg shall be permissible throughout the season.

**4.2.3** *Baling/Pressing*

The bales shall be fully covered with hessian/cotton fabric and no portion of cotton shall be exposed. The bales shall be securely strapped with minimum of 9 wraps of bailing hoops. The hessian/ cotton fabric shall be stitched using a 6 ply cotton twine. The stitched shall be evenly spaced and properly made. The distance between the two stitches shall not exceed 30 mm.

**4.2.3.1** The material used for packing of bales shall conform to the requirements given below:

a) *Hessain* - Conforming to Type –II (270 b/$m^2$) of IS 2818 (Part 3)

b) *Cotton fabric* – Conforming to variety No.2 (170 b/$m^2$) of IS 175

c) *Bailing hoops* – Conforming to IS 1029 having minimum width of 12.5 mm and thickness of 0.9 mm.

d) *Cotton twine*- Having linear density of 600 to 800 tex and minimum breaking load of 6 kgf.

## 5. MARKING

**5.1** A starched cotton cloth label of 400 mm X 250 mm size placed securely below the bailing hoops shall bear the following information:

a) Name of variety of cotton;
b) Press mark number;
c) Press running number;
d) Mass (weight) of pressed bale (kg)
e) Crop year;
f) Station;
g) Country (in case of export only).

Note: The letters used for marking shall be approximately 12 m in height.

**5.2** The cotton bales may also be marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions *of Bureau of Indian Standards Act, 1986* and Rules and Regulations made there under. Details of conditions under which a license for the use of Standard Mark may be granted to manufactures or producers, may be obtained from the Bureau of Indian Standards.

## 6. SAMPLING

**6.1 Lot**

In any consignment, the bales of a particular variety of cotton ginned under identical conditions shall constitute a lot.

**6.2** Sample for determination of trash content shall be drawn as per 3 of IS 4952 and the gross sample shall be reduced as per 4 of IS 4952. However the weight of tufts drawn from each sub-square be decided in such a way that the reduced sample meet the requirement of IS 4871.

## Annexure 7: Initiatives in the area of farmer information dissemination: select case studies

**Case study: ITC e-Choupal**

The e-Choupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, who block critical market information from passing to the farmers and use that information for getting a big margin for themselves.

e-Choupal is an ICT platform for carrying out trade at a number of locations. In this, ITC sets up a back-up physical service support at the village-level, called Choupal, through Sanchalak: a lead farmer, who acts as the interface between computer and the farmer. ITC accumulates information regarding weather, modern farming practices, and market prices from sources like Meteorological Department, Agri-universities, mandis (regional market), etc., and uploads all the information on to e-Choupal web site. All information is customized according to local farmers' requirements and provided in the local language through computer set up by ITC in Sanchalak's house. Sanchalak accesses this information and facilitates its dissemination to farmers. Information regarding weather and scientific farming helps farmers to select the right crop and improve the productivity of their farms. Availability of market information helps farmers to become market oriented. They know what price ITC is quoting and the price prevalent in the local market, thereby helping better price realization for farmers. If farmer decides to sell to ITC, Sanchalak works as the aggregator of small farmers produce to sell them to ITC. Sanchalak also aggregates farmers input purchase orders for various items like seeds, pesticides and places them directly with the suppliers through internet and facilitates supply of high quality farm inputs as well as purchase of farm produce at farmers' doorstep with the help of intermediaries.

**Case study: IFFCO-Farmer Information Kiosk and IFFCO Kisan Sanchar Limited (IKSL)**

IFFCO runs around 110 e-services kiosks in the rural heartland of the country (mainly in North India) covering 16 states. In addition, 10 kiosks are operated by co-operative federations, which are members of IFFCO. These kiosks disseminate information to farmers on a range of topics, from best agriculture practices, market information and weather related information to fertilisers, crop prices and health information in their native languages. The kiosks, which use IBM's Lotus Notes Software and Lotus Domino replication technology, cover even the very remote areas where network connectivity is available for a very short duration. Around 50 lakh farmers from 1,000 villages are estimated to be benefitting from this initiative, which was kicked off in 2001. User-friendly intuitive graphic based navigation is provided to facilitate viewing in touch screen environment. Training programmes and farmers meetings are conducted to encourage farmers' to use the facilities provided in farmers' information kiosks.

Another initiative of IFFCO - *IFFCO Kisan Sanchar Limited (IKSL)*, is a joint venture between IFFCO and Bharti Airtel. IFFCO's business model is an exchange programme with Airtel. IKSL identifies the needs of the farmers and retails them the mobile phones, SIM cards, and information services, through the vast reach of co-operative societies. The main innovation is the use of a SIM card, called the green card, with a voice message platform to record content and send information to farmers through voicemail. When signing up to the IKSL service, farmers get access to five daily messages in their local language

with crop and area specific information, a help line and interactive information services, all free of cost. The messages cover information in relation to agricultural market prices and arrivals, availability of fertilizers, electricity timings, and early warning systems on disasters, weather forecast, best farming practices, local crops, education and upcoming training opportunities, plant and veterinary disease prevention, financing and insurance services and government schemes. The information is provided by a large network of partners including: IFFCO's extension workers and agronomists, state and national research institutes, universities, and extension services. In turn, IKSL generates revenue by retailing the handset and increasing the number of subscribers.

**Case study: Krishi Vigyan Kendra**

The scheme of Krishi Vigyan Kendra (KVK) was initiated by the Indian Council of Agricultural Research (ICAR) to promote the following activities[26]:

- Conducting "on-farm testing" for identifying technologies in terms of location specific sustainable land use systems (Technology Assessment and Refinement)
- Organising training programmes to update the extension personnel with emerging advances in agricultural research on regular basis (In-service training)
- Organising short and long-term vocational training courses in agriculture and allied vocations for the farmers and rural youth with emphasis on "learning by doing" for higher production on farms and generating self-employment (Vocational training)
- Organising front line demonstration (FLD) on various crops to generate production data and feedback information

Other main activates of KVK include formation of farmers commodity based groups, conducting monthly zonal workshops with extension functionaries, rendering need-based farm advisory services, implementing State and Central Government sponsored agriculture related development programmes, developing location specific technologies, conducting skill demonstrations, disseminating technologies through AIR, Doordharsan, websites and newspapers and spreading awareness about precision farming, National Horticulture Mission, etc.

ICAR has established 588 KVK across India. These KVKs are funded by ICAR and implemented by various ICAR institutes, State Agricultural University, NGOs and State Department of Agriculture. To establish a KVK in the specific region based on the need for the services, the individual zone seeks applications from University/State Government or NGOs who fulfil minimum eligibility criteria in terms of land, facilities and financial position. Once the ICAR zonal committee approves the application, KVK gets direct funding from ICAR for establishing the required infrastructure and operating the facility. The KVK also get annual maintenance expenditure from ICAR.

[26] Source: www.agritech.tnau.ac.in/kvk

# Annexure 8: Cotton Bale Manager- software for tagging and management of cotton bales in Indian ginneries[27]

In India about 325 lakh bales of cotton are produced annually in more than 4000 ginneries. A ginnery processes about five thousand to one lakh bales in a year depending on its size and availability of raw material. Manual method of bale marking and record keeping is followed in India which is very tedious and cumbersome. Fibre quality gets affected due to spreading of ink used for bale marking. Also after prolonged storage, readability of markings on bales becomes difficult due to ink fading. Moreover marking of fibre quality parameter on bale is not practiced in India because of limitations of manual bale marking method.

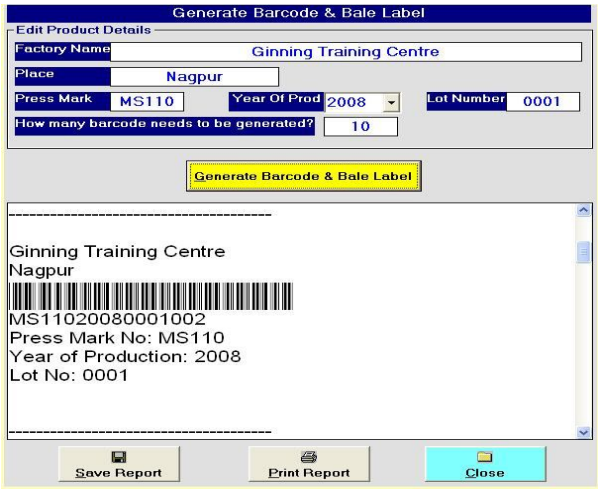
To overcome these lacunae and to have co-ordination among supplier and buyer while trading of bales, a computerized application namely 'Cotton Bale Manager' has been developed. It consists of two important functionalities – (1) Design and generation of bale labels using barcode technology and (2) Development and management of bale database including the information of the generated bale ID.

**Design & Generation of Bale Labels**

A software has been developed to generate unique barcoded labels for every cotton bale produced in a ginnery. Developed bale tag contains following information - name of factory, place of processing, barcode, permanent bale identification (PBI) ID, press mark number, year of production and lot number. Permanent Bale ID is a 16-bit ID a combination of parameters.

Each parameter has been allotted pre-decided digits to arrive at a 16 bit PBI number. The order of placement is fixed as below.

Press Mark: Five Digits, Year: Four Digits, Lot No: Four Digits & Bale No: Three Digits



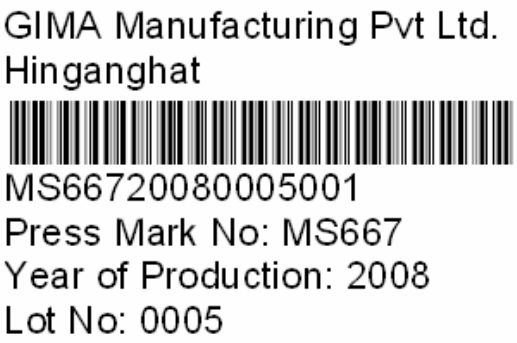

Design and generation of customized barcoded bale label


Database on bale production information along with HVI tested fibre qualities

[27] Source: Ginning Training Centre of CIRCOT, Nagpur

Cotton Bale Manager also includes an integrated database of several types of records that are marked on bales in a ginning factory. Currently, the program includes data on year of production, lot no, press mark no, bale weight, grade, variety etc. Additional information on HVI tested fibre quality parameters of bales i.e. staple length, micronaire, strength, uniformity ratio, tenacity and colour are also incorporated into the database against the bale ID to ease bale marketing. Developed database application has added functionalities on several aspects of database management. User can browse and search database using different criteria. Users with administrative right can also edit record and alter different fields within a record. User can search and query database and generate report satisfying requested query.

Cotton Bale Manger was successfully tested on the cotton bales prepared under National Agricultural Innovation Project (NAIP) of cotton value chain. Bale labels were printed with the help of barcode printer on plastic stickers of 100 x 75 mm size.




Barcoded bale label

## Annexure 9: Do's and Don't's for Clean Cotton Picking

# National Agricultural Innovation Project
# On
# Cotton Value Chain

# Do's and Don't's for Clean Cotton Picking

**At Farms: Do's:**

- ✓ Pick kapas only from well-opened bolls.
- ✓ Use only cotton bags for collecting bolls.
- ✓ Gather the insect-infested, stained and hard locks as well as locks picked up from the ground in a separate bag, in the interest of clean cotton.
- ✓ Instruct cotton pickers to cover their heads with cotton cloth to prevent kapas being contaminated with hair.
- ✓ Stack kapas on cotton cloth or canvas and never keep cotton on bare ground to prevent kapas being mixed with oil or sand.
- ✓ Clean the hand cart/tractor trolley before loading kapas.
- ✓ Cover the cotton loaded in hand cart/tractor from all sides with cotton cloth or canvas.

**At Farms : Dont's:**

- ✓ Do not pick cotton before dew drops evaporate in the early morning hours.
- ✓ Do not gather leaf bits, stems, twigs, bracts, etc. while picking cotton.
- ✓ Avoid mixing of kapas from different varieties or from different pickings of the same variety to maintain the grade of cotton.

**At Market Yards : Do's:**

- ✓ Keep market yards clean.
- ✓ Unload kapas on cotton cloth or tarpaulin to enable evaluation by buyers.
- ✓ Heap kapas on clean, paved ground or after spreading tarpaulins on the ground and protect the heap with suitable cloth cover.
- ✓ Cover kapas lots with tarpaulin so that rain water does not seep in.
- ✓ Keep paved platforms away from trees to avoid contamination of cotton with leaves and bird nuisance.

**At Market Yards: Dont's:**

- ✓ Never unload cotton on bare ground to prevent cotton from being mixed with soil.
- ✓ Do not mix seed cotton lots of different varieties, as such mixing will reduce the quality.
- ✓ Do not throw empty packets of tobacco, betel nuts, etc. on kapas heaps.