

Cotton standardization and grading: Pakistan

ABSTRACT

Cotton occupies a unique position in Pakistan's agrarian economy. Since the country has the potential to become a key player in global cotton and textile markets, the government has been giving priority to research and development programmes focusing on quantitative and qualitative improvements in cotton. Despite a notable increase in cotton production over the years, however, unsuitable picking methods, adulteration of seed cotton with water and foreign matter, mixed seed and mixed grades have reduced the quality of seed cotton. These factors, coupled with inappropriate ginning techniques, have downgraded the lint quality. According to one estimate, the country has been losing some **10-15** percent of the commercial value of its cotton.

The core of the problem facing the country's cotton industry has been the absence of a recognized and scientifically devised standardization system. The marketing and pricing system had been based on cotton varieties and weight, which resulted in a variety of grades and staples. The government therefore decided to introduce standardization and a pricing system based on premiums/discounts to bring Pakistan cotton on a par with internationally accepted standards and to ensure better returns for cotton growers, ginners, spinners and the national economy.

In **1983-84**, the government was assisted by the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) in setting up a cotton standardization system. The project lasted until 1986, by which time the foundation had been laid. The project upgraded facilities in ginneries and produced a core of trained graders, classers, arbitrators and instructors, who were able to evaluate and segregate seed cotton and lint both visually and instrumentally, according to the new standardization system. **These trained personnel introduced standardization in 17 ginning factories in the 1984-85 cotton season and 33 in 1985-86.** For the first time, Pakistan was able to export some of its production under standard grades, achieving a higher price than for ungraded cotton.

Following these achievements, a Cotton Standards Institute project was

initiated in 1987 with technical and financial assistance from UNDP, FAO and the Asian Development Bank (ADB). The aims were to:

- establish a permanent institute and a cotton standardization programme based on an internationally acceptable grading and classing system;
- prepare grades and standards for seed cotton and lint;
- train new generations of graders, classers, arbitrators and instructors.

By the end of the project in 1994, achievements in the cotton sector had earned Pakistan recognition both within and outside the country.

First, the project established a national institute, the Pakistan Cotton Standards Institute (PCSI), based in Karachi with two regional centres located in Punjab and Sindh provinces. PCSI is designed to implement the cotton standardization and grading system at ginnery level, ensuring the supply of cleaners and uniform raw cotton to the domestic textile industry. The objective is to raise the status and value of Pakistan's raw cotton and yarn on the world market. The institute's three sites have been equipped with classrooms, fibre-testing laboratories and lecture rooms, complete with modern technology.

Second, the standards for seed cotton and lint cotton developed by the project were approved by the government in 1990 and declared the official standards for Pakistan cottons. These standards were recognized in 1991 by the Liverpool Cotton Association for conducting arbitration of Pakistan cotton. Another significant achievement was the design in 1992 of the colour chart for Pakistan cottons, which allows the country to evaluate its raw cotton on the High Volume Instrument (HVI) according to its own official standards.

Some 180 cotton classers were trained and 19 female fibre-testing technicians were instructed in the operation of testing instruments. In collaboration with the Cotton Export Corporation, the project demonstrated the cotton standardization and grading system in several ginning factories, where the concept of grade premiums/discounts was implemented.

Thanks to the standardization system and segregation of some better cotton types in selected ginneries, Pakistan cottons are now quoted in the Cotlook Price Index A. Previously, they had been quoted only in Index B, which gives a price five to seven US cents per pound less than the A index. During the project, the Cotton Export Corporation earned a premium of US\$19.45 million on the export of 2.33 million bales of higher-grade cotton, demonstrating the financial benefits obtained by switching to the standardization and grading system.

The introduction of cotton standards and grading and the provision of premiums/discounts for various grades are part of an ongoing programme to develop the whole cotton marketing and pricing system in Pakistan. The enactment of the Cotton Standardization Bill will give legal status to the establishment and

activities of the institute. The Karachi Cotton Association, a representative body of private-sector raw cotton exporters responsible for issuing daily spot rates for raw cotton, has agreed to switch to pricing of raw cotton on a grade and staple basis, rather than on varieties. Private-sector ginners, exporters and spinners have expressed interest in having personnel trained by the institute in cotton grading/classing.

The innovative experience in Pakistan has improved cotton handling. The country is now able to compete with the best cotton fibres in the world, an achievement that took just over ten years. The introduction of the standardization and grading system has demonstrated that proper marketing and quality control measures and a pricing system based on premiums and discounts increase the quality and value of the commodity. It shows that such a system motivates all parties, growers, ginners, spinners and exporters, to collaborate to meet consumer demand and compete in the global marketplace.

There is scope for this example to be replicated in the cotton industries of other countries, including newly independent states in Central Asia. An opportunity exists for the transfer of expertise from the PCSI into the cotton industries in countries adjacent to the Aral Sea.

BACKGROUND

Pakistan is an important cotton and yarn producing country, with the potential to become a key force in the global cotton and textile market. To achieve this goal, the country has to improve cotton marketing and quality control. There is growing realization that the challenges of the new world trade order and the ISO 9000³³ system demand a positive and quick response to the demands of world markets.

The bulk of cotton produced in Pakistan has a fibre length of above 2.6 cm. From this material, 30-40 counts³⁴ of yarn can be manufactured. According to estimates, however, this cotton has a high impurity content and high counts of foreign matter, trash and water. It is consequently regarded as poor by international standards. The impurities reduce the beneficial effect of the improvement in cultivars, impairing the quality of raw cotton and the rating of yarn and fabric, a cause of imperfect dyeing. The low quality of yarn produced in the country relates to unevenness, shading and contamination, defects that prevent manufacture of a final product with high value added.

³³ ISO 9000 is an international quality standard that helps businesses define and document their own quality procedures for production and/or services.

³⁴ Counts are a means of qualifying the type of yarn produced.

According to the Japan International Cooperation Agency (JICA) in a study on the Textile Development Programme (1992): “The problems relating to the quality of raw cotton represent important obstacles to the development of the textile industry in Pakistan. Even if various improvements in the textile processing industries are undertaken, it may be difficult to effect an upgrading of Pakistan’s textile products if the quality of raw cotton remains as it is now.” A further assessment revealed that malpractices during marketing and the absence of quality-control measures or any recognized standardization system had led to a 10-15 percent loss in the value of raw cotton and manufactured goods, resulting in huge losses to the economy. This may be attributed to the traditional seed cotton marketing system, where the main emphasis is on weight and variety. Disregard for quality, such as lower trash and moisture content, is attributable to the lack of incentives for producing clean picked seed cotton and good quality lint. Lack of quality control is the main deficiency of the cotton marketing system.

The Government of Pakistan recognized the need for quality considerations in the marketing system and has introduced a cotton grading system. The objective is to improve the competitiveness of Pakistan’s raw cotton and yarn in order to ensure better returns for cotton growers, ginners, textile mills and the national economy. The newly introduced system includes the grading of seed cotton and the classification of the resulting lint. An independent organization, the Pakistan Cotton Standards Institute, has been established with assistance from the Asian Development Bank, FAO and UNDP. The institute has trained personnel and is well equipped with sophisticated laboratory instruments to grade and classify cotton. The main thrust is to revamp cotton marketing by emphasizing quality in assessing the value of raw cotton. Ginners have in general been unable to provide farmers with incentives to supply dry and clean picked cotton, because they themselves receive no premium for producing good-quality lint.

The cotton grading system is not intended to apply only to exportable surplus. Quality cotton may be interpreted differently by different spinners but some factors are standard requirements, such as being contamination-free, stickiness-free, well ginned and with an even running lot. The cotton standardization and grading programme gives great assistance to the textile industry by providing clean, uniform cotton. The problem faced by spinners is to procure cotton of standard quality required to spin a certain count of yarn with good results. In selected ginneries, the grading system has shown that it helps reduce contamination and variations within bales, from bale to bale and from lot to lot. This in turn leads to cost savings and improved processing efficiency, dyeing and finishing.

INTRODUCTION

In 1983, the Government of Pakistan sought assistance from FAO and UNDP to introduce a grading and classification system for seed cotton and lint and train a nucleus of cotton graders and classers to implement the new system. The concept of grading and classification had been accepted by the cotton sector as essential for improving the quality of the country's cotton in order to obtain maximum value for sold lint cotton and improve cotton farmers' incomes.

FAO/UNDP assistance in setting up the cotton standardization system started as project PAK/80/024 in October 1983 and ended in June 1986. The project aimed to:

- provide training for cotton graders and classers;
- set standards for seed cotton and lint to ensure their full value in local and international markets;
- upgrade operating facilities at some of the principal ginneries to improve the quality of lint through application of standardization and quality-control measures.

The project established a viable foundation for standardizing Pakistan's raw cotton. It upgraded facilities in participating ginneries and produced a nucleus of trained graders, classers and arbitrators able to evaluate and segregate seed cotton and lint, visually and instrumentally, according to the new standardization system. This was achieved through the use of the most up-to-date instruments.

During the project, trained personnel were able to introduce and apply the standardization system in 17 ginneries in the 1984-85 cotton season and 33 in 1985-86. For the first time, Pakistan was able to export some of its production under standard grades and achieve a higher price than that of ungraded cotton.

The impact of project activities on the cotton sector and the national economy was considerable and the government recognized the need to expand the standardization system to cover the entire cotton sector. Further FAO/UNDP assistance was therefore sought to establish a permanent body, the Cotton Standards Institute, to build on the achievements by applying quality-control measures, training a new generation of graders, classers, arbitrators and instructors and supervising all cotton-handling activities.

After successful introduction of the system in 1985, the need to establish a recognized standardization system and an institute to implement it at national level was discussed by FAO/UNDP with the Asian Development Bank and the Government of Pakistan. A project agreement was signed between the Government of Pakistan and UNDP in September 1987.

The long-term objective of the project was to contribute to the development

of agriculture as an export-based industry by increasing the value of the cotton crop. This was to be achieved through application of post-harvest quality controls to obtain optimum prices for improved seed cotton and lint.

The immediate objectives of the project were to:

- establish an independent institution capable of implementing a cotton standardization programme based on internationally acceptable cotton classification and grading;
- establish grades and standards for Pakistan cottons for domestic and international trade in raw lint cotton;
- initiate application of quality-control measures.

Other aims of the project were to:

- prepare internationally recognized standard lint samples for commercial varieties of Pakistan cottons;
- establish seed cotton grades;
- train lint classers and seed cotton graders to supervise quality control in ginneries;
- establish fibre-testing laboratories and classification rooms equipped with modern instruments;
- apply fibre-testing technology using internationally accepted instrumentation;
- investigate and introduce High Volume Instrument (HVI) classing methods;
- arbitrate grading disputes between seed cotton growers and ginners and between lint ginners and spinners;
- establish premiums and discounts for varying qualities of seed cotton and lint, based on internationally accepted standards;
- liaise between growers, ginners and users of cotton fibre and make recommendations on maximizing profits.

On completion in December 1994, the project had earned recognition within the country and from overseas for the following achievements:

- A national institute, the Pakistan Cotton Standards Institute, was established with headquarters in Karachi and two regional centres in Multan in the Punjab and Sukkur in Sindh province.
- The grading standards for seed cotton and lint developed by the project were approved by the government in November 1990 and declared the official standards for Pakistan cottons.
- In July 1991, the official standards for lint cotton were recognized by the Liverpool Cotton Association. Arbitration of Pakistan cottons could thus be conducted on the basis of these standards. The system of grades and

standards was implemented in ginneries in collaboration with the Cotton Export Corporation. Official standards were sent to the Bremen Cotton Exchange in Germany and the Cotton Association of Italy.

- The project designed a colour chart for Pakistan cottons for evaluation of raw cotton on the HVI, according to the official standards.
- 180 cotton classers have been trained so far and 19 female fibre-testing technicians have been instructed in the operation of fibre-testing instruments.
- Classrooms, fibre-testing laboratories and lecture rooms have been established at the Cotton Standards Institute in Karachi, Multan and Sukkur and equipped with modern instruments.

The colour chart, a significant project achievement, was designed in 1992 on the basis of visual classification and fibre test results for colour and trash contents of samples drawn from Pakistan's entire cotton belt. Lint cotton standards boxes were prepared on the basis of this colour chart. Tests of the colour and trash contents for each biscuit³⁵ showed that the result plotted on the colour chart fell within the lines of each grade on the chart.

Since the results were promising, it was decided to ask the two HVI manufacturing companies in business at the time to incorporate the colour chart into their software, so that Pakistan cotton grades (PAK GRADE) could be displayed on computer monitors and printed out. The chart has been incorporated into the HVI software manufactured by M/s Zellweger-Uster, with the result that HVI systems in Pakistan are now able to evaluate the colour grade of Pakistan's cotton according to the official lint standards for domestic and international trading.

PRE-IMPLEMENTATION

Pakistan cotton is of inherently good quality. Its fibre strength is high, micronaire values are acceptable and staple length ranges from 2.38 cm to 3.15 cm. It is hand picked, though not comparable to the consistently clean hand-picked cotton found in some countries. Payment by weight and lack of premiums for pickers result in a trashy and almost single-grade seed cotton. The moisture content of seed cotton arriving at ginneries is reported to be much higher than the recommended level. Such post-production mishandling of the crop dilutes efforts and investments made to evolve varieties capable of producing quality cottons

³⁵ Biscuit is a sample of lint cotton contained in the cotton standards box and used as the basis for comparative testing of cottons.

³⁶ Micronaire is an instrument used for measuring the fitness or maturity of a cotton sample.

and therefore better yarns. This results from the lack of a formal system of premium pricing in the country.

The quality of ginned cotton has deteriorated over the years. There was no incentive to improve ginning procedures and produce quality cotton, because there were no buyers for graded cotton. The ginners were mixing all types of cotton to obtain the maximum benefit from a cotton pricing and marketing system based on variety and weight. The Karachi Cotton Association was issuing spot rates on the basis of variety, which practically does not exist in the absence of any strict zoning. Almost all the cotton bales in the ginning factories were being marked with a single variety (MNH-93), even in cases where the proportion of this variety was insignificant. Seed cotton and lint support prices issued by the government were also based on variety without taking into account quality premiums and discounts. It was common malpractice to increase the weight of seed cotton, since pricing focused on volume and not on specifications.

In short, despite being a major cotton producer and exporter, Pakistan did not have a recognized or scientifically devised standardization and grading system. As a consequence, the country was losing a significant amount in foreign exchange because raw cotton was being sold at a discounted price. The yarn export price remained much lower than the prevailing prices for similar grade yarns from Brazil, Greece and Turkey. This adversely affected foreign exchange earnings, badly needed for development programmes.

INTRODUCING INNOVATION

The introduction of a cotton standardization system in Pakistan's cotton industry aimed to transform the traditional cotton pricing and marketing mechanism to bring it into line with globally accepted principles and procedures. This effort was highly desirable in view of the country's heavy reliance on raw cotton and textile products for foreign exchange earnings – cotton and its products account for over 60 percent of export receipts. Further gains in cotton production are expected through improvements in quality.

Against this background and on the basis of the technical capabilities developed through FAO/UNDP support, the government has established the Pakistan Cotton Standards Institute, an independent and permanent body to introduce and implement standardization and quality control of cotton.

Its specific objectives are to:

- establish cotton standards and seed cotton grades for classification;
- prepare, approve and sanction standards boxes and seed cotton boxes;
- apply quality control for cotton exports and handling procedures in certified ginning factories;

- conduct classification of lint cotton and issue lint cotton quality cards for each lot;
- conduct training in cotton grading and cotton classing for ginners, spinners and exporters of public and private-sector institutions;
- settle disputes of classification and grading among sellers and buyers of seed cotton and cotton lint;
- apply cotton fibre testing technologically, using internationally accepted instrumentation, to review and introduce improved methods of testing;
- recommend minimum premiums and discounts for varying qualities of cotton;
- issue postgraduate diplomas to successful trainees in cotton classification, arbitration and appeals and cotton fibre testing;
- provide programmes of research, information and application of technology for cotton standardization.

Management of PCSI

The general direction and administration of the institute is vested in the Board, which consists of representatives of the following:

- Ministry of Food, Agriculture and Livestock
- Ministry of Commerce
- Ministry of Finance
- Government of Sindh
- Government of Punjab
- Cotton Export Corporation
- Karachi Cotton Association
- All Pakistan Textile Mills Association
- Pakistan Cotton Ginners Association
- Textile Commissioners' Organization
- Chamber of Agriculture, Sindh and Punjab.

The Board has a federal secretary of agriculture as its chairman. An executive committee of Board members has been formed to function as the principal administrative body of the institute.

PCSI funding

The institute is currently being supported by government grant but may charge a fee for standardization of cotton at rates that the federal government may fix by notification in the official gazette.

The institute has been earning 1-2 million rupees annually through fibre-testing facilities and training programmes offered to the private sector. With

implementation of the grading system at national level, the institute will become self-financing by levying a standardization fee at ginnery level. With such income, the institute will establish a network of fibre-testing laboratories and class centres to assist cotton growers, ginners, spinners and exporters in their localities.

Legislation

In 1994, encouraged by visible progress under the PCSI project, the government decided to establish the PCSI as a permanent autonomous body to introduce and implement the seed cotton grading and lint cotton standardization programme and to train cotton graders, classers and arbitrators.

A draft bill to establish PCSI prepared by the Ministry of Food, Agriculture and Livestock and vetted by the Ministry of Law, Justice and Parliamentary Affairs was submitted to Cabinet for approval of promulgation as an Ordinance, which was done on 17 October 1994. The Cotton Standardization Ordinance was then promulgated on 10 November 1994 and subsequently re-promulgated, pending enactment of the Bill.

In July 1996, the government made the decisions given below in order to implement the cotton standardization and grading programme.

- The Ministry of Commerce may allow the Karachi Cotton Association to issue daily spot rates for cotton on the basis of grade and staple rather than variety in order to introduce quality considerations to cotton marketing.
- In order to upgrade Pakistan cotton and realize its intrinsic value on the world market, private-sector exporters should purchase cotton graded under the supervision of skilled PCSI classers.

With enactment of the Cotton Standardization Bill, every ginning factory with a production capacity of 5 000 bales will be registered as a certified ginning factory and follow the standardization procedure and other technical requirements. The institute will assign a classer to one or more certified ginning factories to supervise implementation of the system and to carry out classification of lint cotton for issue of quality cards for each lot of 100 bales. The Karachi Cotton Association will start issuing spot rates for raw cotton on the basis of grade and staple, thereby shifting the cotton pricing system to the official grades. These arrangements are expected to be effective for the 1998-99 cotton season.

The experience of developing and introducing an innovation to reform the marketing mechanism of a sensitive commodity such as cotton reveals that in order to avoid delays, the following factors should be considered.

Involvement of bulk consumers

In a cotton-producing country where the bulk of production is consumed locally,

collaboration by spinners in recognizing and adopting changes in raw cotton marketing is vital. For successful and early implementation of such a system, the focus should be on bulk consumers.

Voluntary adoption

The success of the innovation results from the fact that the parties concerned will adopt the system if it is attractive enough, even on a voluntary basis. To stimulate this, the government may allow certain fiscal incentives to keep interest alive.

POST-IMPLEMENTATION

The PCSI project (PAK/86/003) has been instrumental in establishing the application of a nationally accepted and internationally recognized cotton grading and standardization system in Pakistan. The impact of the project may be assessed in terms of changes in policies and practices related to cotton pricing and marketing in the country:

- seed cotton grades and lint cotton standards were approved by the government in November 1990 as the official standards for Pakistan cottons for the first time;
- the Karachi Cotton Association adopted the officially approved standards in September 1993;
- the government's seed cotton support price policy started incorporating premiums and discounts for various grades in 1991-92;
- the Karachi Cotton Association has agreed to issue a daily spot rate for raw cotton, based on grade and staple rather than variety, with permission from the Ministry of Commerce;
- with the availability of higher-quality exporting types, 1544 and 1505, produced from graded cotton, Pakistan cottons have been quoted in the Cotlook Price Index A instead of Index B;
- the government, convinced of the need for a system based on grading and quality control, promulgated the Cotton Standardization Ordinance in 1994; enactment as a Bill is being processed;
- the Liverpool Cotton Association adopted the officially approved Pakistan Lint Standards in June 1991, replacing the earlier grade boxes developed by the Karachi Cotton Association on the basis of varieties;
- the project's contribution in modifying HVI software to accommodate the grading system of Pakistan was recognized by the 22nd International Cotton Conference in Bremen, Germany, in March 1994.

Prior to the establishment of PCSI, there was no formal organization available

for educating and motivating growers, ginners, spinners and exporters to implement a cotton grading and classification system and other quality-control measures. The following ongoing activities only became possible after developing infrastructure and technical capabilities through technology transfer and economic assistance provided under project PAK/86/003.

Training programmes

The institute has been conducting training programmes in cotton grading/classification and instrumental evaluation of fibre properties using HVI. There has been encouraging response from the private sector and over 700 people have been trained. A classer from the Cotton Development Organization in Uganda benefited from a one-month training period at the institute.

Fibre-testing services

Fibre-testing laboratories established at the institute's headquarters and regional centres have been extending their facilities to the private sector. These laboratories, equipped with modern fibre-testing instruments, are registered with the Bremen Baumwoll Rund Test conducted by the Faserinstitut Bremen, Germany, and the International Calibration Check Test Programme conducted by the Fibre Performance Section of the United States Department of Agriculture.

Supply of standards/grade boxes

Replicas of seed cotton grades and standards boxes for lint cotton are regularly prepared for supply to prospective ginners, spinners and exporters. The private sector has been showing interest in obtaining the sets of grade boxes for reference.

Preparation of export type rolls

In order to assist raw cotton exporters, the institute is providing technical support to the Karachi Cotton Association in preparation of Pakistan cotton export types matching the approved grades.

Grading at ginneries

Encouraged by the project experience, ginners have been voluntarily adopting the grading and classification system. The institute is extending support by sending technical field staff to ginneries to carry out seed cotton grading and lint classification.

The efforts made through the project have been so successful in developing awareness in the cotton industry that, with implementation of the cotton

standardization and grading programme, the status of Pakistan cottons can be increased in the international market. This should help earn substantial foreign exchange from the export of raw cotton. Cleaner, more uniform graded cotton for use in the domestic textile industry will ensure a better reputation abroad and obtain a higher price for the resulting yarn.

General Information

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