

Chapter A. Project objective and scope

(Extract from the Appraisal Report)

Stickiness in cotton is mainly caused by sugar-like excretions from two insects (*Aphis gossypii* and *Bemisia tabaci*), and severely disrupts the spinning processes, thereby increasing the cost of spinning and reducing the quality of yarn.

Cotton producers are faced with severe price discounts when selling their cotton if this originates from areas suspected of being contaminated by stickiness. In order for cotton to maintain its competitiveness *vis á vis* synthetic fibers on the world markets, and to at least maintain acceptable profitability levels in production, efforts need to be undertaken to reduce the production and processing costs.

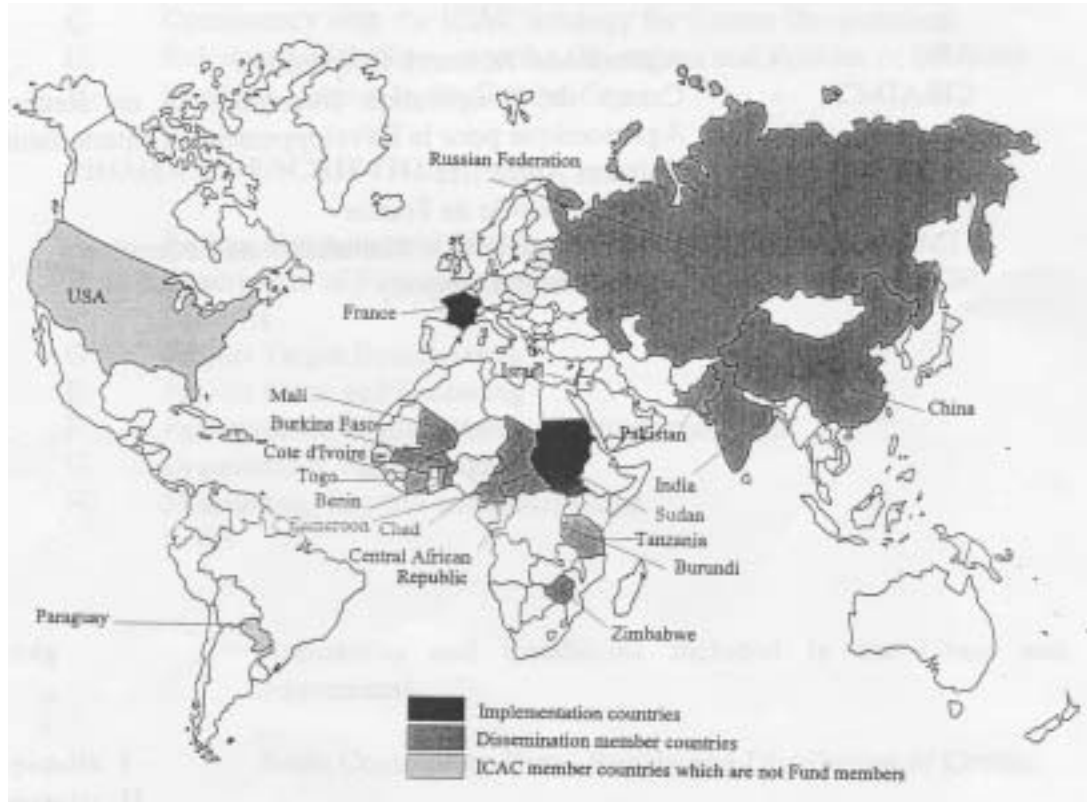
While another Fund-assisted project focused on the development of an integrated pest management system to reduce stickiness in the field, the present project aimed develop reliable methods to separate sticky cotton from non-sticky cotton and determine threshold levels for sticky cotton processing under varying environmental conditions.

These latter trials took place under real production/factory conditions. The methodologies developed and the experience acquired in this project are of benefit to all cotton-producing countries affected by stickiness in one or more of their cotton-production areas. The project comprised the following three components:

- (a) testing and evaluating the process for classifying sticky cotton;
- (b) establishing the process-ability of sticky cotton; and
- (c) evaluating of the financial viability of the processes, training, and dissemination of the process developed by the project.

Map

Location of the Project for Improving the Marketability of the Cotton Produced in Zones Affected by Stickiness¹



Countries experiencing major problems with stickiness in one or more of their cotton-producing areas (source: ITMF - Cotton Contamination Survey, 2000)

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The colours, boundaries, denominations, and classifications in this map do not imply, on the part of the Common Fund for Commodities or its Members, any judgement on the legal status of any territory, or any endorsement or acceptance of any boundary. The projections used for maps may distort shape, distance, and direction.

I. INTRODUCTION

A. Project Background

The Standing Committee of the International Cotton Advisory Committee agreed on November 16, 1993, to sponsor a project entitled: " Sticky Cotton: Possible Control Methods from Plant to Yarn". The project focused on the elimination of the causes of stickiness in the field, the development of forecasting methods for areas likely to be affected by stickiness, the development of methods for separating sticky cottons from non-sticky cottons, and on the development of methods to treat stickiness after ginning. The project was submitted to the Fund and reviewed by the Fund's Consultative Committee at its Tenth Meeting in January 1994.

The Committee acknowledged the importance of addressing the problem of stickiness in cotton and its importance in the context of maintaining or improving cotton's competitive position *vis á vis* synthetic products. The Committee was, however, of the opinion that the first two objectives of the project would likely overlap with activities (to be) undertaken in an ongoing project "Integrated Pest Management for Non-Sticky Cotton", which was being implemented in Israel and Egypt, with field activities in Zimbabwe and Ethiopia. The third and fourth objective, however, were considered to be relevant and the proposal was thus adjusted accordingly. Furthermore, a dissemination component was added to the project.

The ICAC prepared a revised project proposal taking into account the observations made by the Committee. The revised proposal, entitled "Improving the Marketability of the Cotton Produced in Zones Affected by Stickiness" was reviewed by the Committee at its Fourteenth Meeting in July 1995. The proposal now focused on two objectives, namely the development of a methodology for systematically measuring stickiness in cotton for the purpose of separating sticky parts from non-sticky parts of the production; and on the development of methods which enable the use of varying degrees of sticky cotton for spinning.

In December 1995, it appeared that the counterpart institute, originally foreseen to play a central role in the project, decided to withdraw due to uncertainties with regard to its changing legal status, which negatively influenced its ability to make longer term commitments in the framework of the present project. Steps were undertaken by both the ICAC and CIRAD in order to identify another collaborating institute which had the technical and institutional capacity to execute the project and which had a confirmed interest in the project as designed. The Sudan Cotton Company was subsequently identified as a suitable new partner in the project. The Consultative Committee, in its Seventeenth Meeting in September 1996, agreed that the implementation and dissemination arrangements foreseen in the project and the commitment of the Sudan Cotton Company to carry out the project work is satisfactory and the Committee therefore agreed to recommend the project for approval by the Executive Board.

B. Overview of Structural Conditions in the Cotton Market

The basis for world cotton demand is the consumption of textile fibers, which in turn depends on the growth of the world economy. In the 1990s world income is expected to rise about 3% per year, with increases in population of about 1.7% and per capita income gains of 1.2%. With this level of income growth, textile fiber consumption should rise 2% per year, with per capita fiber use rising from 7.3 kilograms in 1988 to 7.6 kg in 2000. Cotton is expected to lose its current share of world fiber markets of 46%. Thus cotton demand and production are

likely also to increase at a 2% rate.

Cotton is an annual crop, and thus imbalances between the level of world consumption and world production can be corrected in a year or two, as long as market signals are transmitted to producers. It is expected that world production will be in balance with world consumption in 2000, at a level which is about 30% higher than output in 1993/94.

World cotton prices fluctuate from year to year, primarily in response to changes in world stock levels. There has been no secular increase in cotton prices in the last twenty years, and international prices since 1973/74 have averaged about US 73 cents per pound of lint delivered in Europe. Recent increases in average prices (due to low world stocks of cotton) led to an average price of US 86 cents per pound for 1995/96, but based on current estimates the price is expected to come down.

Cotton remains in intense competition with synthetic fibers. In the last 15 years, cotton has regained share of market lost to synthetics in developed countries, due to market development efforts of cotton-producing countries, competitive prices and shifting tastes of consumers toward natural products. As much of the fiber consumed at the level of the final consumer in developed countries is processed in developing countries, textile mill use of cotton in developing countries has grown at a relatively rapid rate of 4% per year. Cotton share of textile fiber consumption at the consumer level in developing countries, however, has declined in the last 15 years from 66% to around 58%, as higher income levels have permitted consumers in many countries the ability to expand their purchases of synthetics, which are usually more expensive than cotton. Recently, however, cotton has lost share in Japan and many European developed country markets, perhaps due to reduced expenditures for cotton market development by cotton-producing countries. Some further decline is expected in cotton's share of market in developed countries in the period. In developing countries, cotton's share may hold at 58% as gains in cotton consumption take place in higher income developing countries.

The location of cotton production and consumption continues to change. In recent years, there has been increasing concentration of world cotton production, with nearly three-quarters of the total now originating in five countries: China, USA, Uzbekistan, India and Pakistan. It is expected that developed countries will be an increasing source of raw materials for developing countries in the rest of the 2000s. Textile industries in developing countries are expected to expand in both cotton-producing and cotton-importing countries.

The restructuring of the economies and societies in Eastern Europe, the former USSR and South Africa, has led to sharp declines in textile industry activity in these countries and have had a profound impact on cotton markets in the last five years. Textile fiber consumption is expected to recover in many of these markets in the period to 2000s, leading to renewed cotton trade flows. The elimination of the Multi Fibre Arrangement, the basis for import quotas for textile products from developing countries in the USA and Europe, should lead to a more rational geographic location of trade in the next 10-15 years. While agreements under the GATT Uruguay Round are not expected to have any major impact on government policies toward cotton, the environment for reducing trade barriers and subsidies in agriculture is improved and there may be further movement toward freer markets as a follow through to the GATT agreement. This may improve the prospects for cotton.

C. Consistency with the ICAC Strategy for Cotton Development

Stickiness in cotton is considered by the members of the ICAC as one of its key priority areas for study and research. As stickiness in cotton increases both production costs as well as processing costs (thereby also reducing producer prices), the Standing Committee of the ICAC has earlier recommended projects for financing by the Fund in the field of crop protection, while the present project is the highest ranked priority project focusing on the post-harvest side of combating stickiness and damage control activities. Problems associated with the processing of contaminated cotton need to be resolved if cotton is to remain competitive with synthetic fibers while producers still receive remunerative prices. It is recognized by the ICAC members that many developed cotton-producing and -consuming countries have the expertise and the means to address these problems. However, most developing countries do not have the research capacity and the financial means to solve these key problems. It is these countries that are most subject to losses in income and loss of markets if solutions are not found. The ICAC has therefore acknowledged the importance of the exchange of technical information between member countries and close cooperation in the solution of mutual problems. The proposed project is an example of both ICAC's prioritization of activities and the recommended international cooperation.

D. Relevance of the Project to the Objectives and the Policies of the Fund

The project is focusing on measures to reduce losses in the value and quality of cotton, thereby improving its competitiveness. It relates to the development of methods to determine the quality of the cotton produced and the level of process-ability of contaminated cotton. It is expected to result in increased revenues for the producing countries. In line with the Fund's priorities, the project aimed to improve the competitiveness of a natural product and to support research and development related to the processing of natural products for which synthetics and substitutes exists. It will thus strengthen the competitive position of cotton which is facing an increasing competition from synthetic fibers. Furthermore, the focal countries for adoption of the process to be developed are developing countries and the main center of project operation is Sudan, which is a Least Developed Country, heavily dependent on cotton for its economic development. The results of the project will, however, be readily applicable in all other countries facing stickiness problems in the cotton-producing areas. It may thus be considered that the project is in line with the Fund's objectives and policies.

E. Previous Support to the Commodity

The first cotton project approved by the Executive Board for financing by the Fund, was a study in 9 major cotton-producing countries, analyzing the factors behind the differential performances of the cotton sector in those countries. That project, entitled "Study of Cotton Production Prospects for the Nineties" was implemented by the International Bank for Reconstruction and Development (World Bank) and was recently completed. The Fund is presently supporting three ongoing projects sponsored by the ICAC. The three projects are: "Integrated Pest Management for Non-Sticky Cotton" implemented in Israel, Egypt, Ethiopia and Zimbabwe; "Integrated Pest Management of the Boll Weevil in Argentina, Brazil and Paraguay; and "Genome Characterization of White-fly-transmitted Geminiviruses of Cotton and Development of Virus-resistant Plants through Genetic Engineering and Conventional Breeding". Activities for this latter project take place in Pakistan, the UK and the USA. All three projects focus on (applied) research in the field of improving cotton production through the development and introduction of efficient and environmentally acceptable crop protection

methods as well as developing disease/pest-resistant cotton varieties. The total amount of financing already expended and committed in relation to support for cotton projects amounts to SDR 4,938,593, i.e. 16.6% of the total CFC commitments (as at 31 August 1996).

II. PROJECT DESCRIPTION

A. Project Rationale and Objectives

The stickiness problem is very complex as the stickiness of the cotton can be due to *inter alia* the following factors: various contaminants (seed coat fragments, neps, insecticides, oil, etc.); physiological sugars, mainly composed of reducing sugars and nectary secretions; and entomological sugars composed of reducing and non-reducing sugars (honeydew). This latter cause of stickiness/contamination has, for the last few years, been by far the most prevalent form of contamination, and is subject of the research undertaken in the framework of the Fund-supported project in Israel, Egypt, Ethiopia and Zimbabwe, focusing on the reduction of stickiness through effective crop protection methods based on principles of effective integrated pest management. The present project had its focus on the post harvest stage of cotton production.

The occurrence of stickiness is not confined to one or a few countries. This phenomenon, which was of little importance in the beginning of the 1980s seems to have become generalized. A survey undertaken by the International Textile Manufacturers Federation (ITMF) involving 235 companies in 30 countries showed that the stickiness problem is increasing. According to the ITMF report "Cotton Contamination Survey 1995" 20% of the surveyed samples had some level of stickiness, and it continues to be the case in the latest reports. Stickiness has therefore become a worldwide problem. Over the last few years all those involved in the cotton industry, from the producer to the spinner, have become increasingly concerned about the problems related to stickiness and have attempted to find a remedy.

Sticky cottons cause disruptions in the spinning process, fouling the cards, the brush tables, the feed trays and the rotors in open end spinning. Apart from the frequent stoppages which require cleaning of the machines, these honeydew deposits also cause irregularities in the card web, slivers and threads, and lead to the production of poor quality yarn. Once sticky cotton is there, the only solution is to isolate the sticky cotton from non-sticky cotton in order to save heavy economic losses to the growers in areas where the problem exists. Stickiness cannot be detected by observation of the cotton during harvesting or during the ginning process. The stickiness problem is usually detected during spinning. It is a time when nothing can be done except to spin whatever is available. In order to avoid unexpected obstructions of the spinning process, cotton spinners only pay the regular price for ginned cotton when they are certain that the cotton lint is clean and does not contain impurities which affect the spinning process. In case of any doubt they will offer only discounted prices for the 'suspect' cotton. These discounts, ranging from 5-30% of the price, are mostly applied indiscriminately to all cotton originating from an area considered to be affected by stickiness. The development of a method to establish an acceptable level of stickiness in cotton bales and to establish operational thresholds in the processing of sticky cotton will have the dual benefit of protecting growers against unjustified price discounting, and it will enable spinners to spin such a cotton through adjustments in the machinery and spinning conditions or through mixing with non-sticky cotton.

The **central objective** of the project was therefore to increase the return on cotton to producers through the development of reliable methods to establish the level of stickiness in cotton bales, and the establishment (under factory conditions) of operational thresholds for the processing of contaminated, sticky cotton. The establishment of processes to successfully deal with the problems of stickiness in cotton will not only raise prices of cotton in currently affected regions but will increase their quantity of marketable cotton.

B. Description of Project Components

The project comprised the following four components: (a) Testing and evaluation of methods for establishing the degree of stickiness in cotton production; (b) Development of a threshold to enable economical processing of sticky cotton; (c) Evaluation of the financial viability of the process developed under the project, training, dissemination of project results through presentations, publications and technology transfer; and (d) Project coordination, supervision and evaluation.

