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THE COTTON ECONOMY OF PAKISTAN

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ERRATA

1. P. v: In the List of Tables and Figures, the title of Figure 7.4 should read, "Pakistan's Shares of World Cotton and Yarn Production, 1949/50 to 1989/90."

2. P. 5, Section 2.2: The figure of 51,554 maunds per acre should be 6.06 maunds per acre.

3. P. 18-19: Note that the CEC buys at market prices unless they fall below the support price.

4. P. 57, Footnote 90: The section referred to should be 9.3, not 5.3.

5. P. 75-6, Section 8.5: In the second paragraph, the first reference to Figure 8.11 should be Figure 8.12 and the second reference to Figure 8.11 should be Figure 8.13. On page 76, in the first paragraph the both references to Figure 8.12 refer to Figure 8.14.

6. P. 82, Figure 9.1: Note that dates of adoption are as of 1990.

7. Appendix A: In persons contacted at the USDA, the first two names should read, "Rip Landes" and "Bill Brant," and the division in which Bill Brant is listed should be "Tobacco, Cotton, and Seeds."

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LIST OF ACRONYMS

ADB	Asian Development Bank
AERC	Applied Economics Research Center, University of Karachi
A.I.D.	Agency for International Development
APCOM	Agricultural Prices Commission
APTMA	All Pakistan Textile Mills Association
CEC	Cotton Export Corporation
cif	cost, insurance, & freight
CRI	Cotton Research Institute, Multan
CSE	Consumer Subsidy Equivalent
CSP	Civil Service of Pakistan
EPC	Effective Protection Coefficient
ERS	Economic Research Service of USDA
fob	free on board
GOP	Government of Pakistan
ICCC	Indian Central Cotton Committee
KCA	Karachi Cotton Association
MEP	Minimum Export Price
NPC	Nominal Protection Coefficient
PCCC	Pakistan Central Cotton Committee
PDA	Punjab Department of Agriculture
PIDE	Pakistan Institute of Development Economics

PPP	Pakistan People's Party
PSE	Producer Subsidy Equivalent
USDA	United States Department of Agriculture

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EXECUTIVE SUMMARY

The unifying theme for this study is the interaction of economics, technology, institutions, and politics as they relate to the taxation and protection of cotton and cotton textiles. Cotton sector exports from Pakistan take the form of either raw cotton, yarn, or cloth.* The specific composition of cotton sector exports has direct implications for the GOP's macroeconomic objectives (taken here to be the maximization and stabilization of foreign exchange earnings, employment, and fiscal revenue), as well as the welfare of farmers, and other participants in cotton sector activities.

The main groups of participants in the sector, in addition to the Government of Pakistan, include: growers, ginners, exporters of raw cotton (both public and private), yarn spinners and exporters, weavers and other textiles manufacturers, and end users of garments. In particular, two powerful lobbies representing raw cotton exporters on the one hand, and cotton spinners on the other, engage one another in continual battle over the composition of cotton sector exports. To the extent that public policy intervenes to restrict raw cotton exports, textiles manufacturers enjoy a subsidy on their primary input. Thus, GOP cotton pricing, marketing, and export policies provide the arena in which this battle is fought.

The GOP has developed a complex and often changing set of policies which affect the cotton sector. This network of interventions includes a variable levy on raw cotton exports, floor prices for cotton farmers and ginners, a price ceiling and a vaguely defined quantitative target for raw cotton exports, a minimum price for export contracts, yarn export and excise taxes, and high rates of protection against textile imports. In addition, from 1972 until 1987, the GOP monopolized cotton exports through a parastatal company, the Cotton Export Corporation, that now competes with private cotton exporters.

The net result of this complicated web of interventions has been to tax cotton producers and exporters to the direct benefit of the leading industrial families who have long controlled a large portion of the textiles industry. From 1981/82 to 1986/87, the net result of these interventions was an average tax on cotton producers equivalent to 15 percent of the value of their production.

In contrast, textile manufacturers have been consistently able to purchase their primary input for 25 to 50 percent below the relevant border price. On average between 1981/82 and 1986/87, textiles manufacturers enjoyed subsidies equivalent to 30 percent of their input (lint cotton) costs. This burden was shared between cotton producers and taxpayers.

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* This study excludes from consideration garments and other cotton textiles made-ups.

The stakes in this tug-of-war have increased in recent years as a result of unprecedented growth in Pakistan's cotton output. Cotton output from independence until the early 1970s had grown by 4.6 percent per year. Yet, following several years of disruption, Pakistan's cotton production since 1978/79 has accelerated to an annual growth rate of over 10 percent. Virtually all of this increase has been in the Punjab. While some of this increase has been the result of increased cotton acreage, the greatest share of these production gains have been the result of technological changes leading to a dramatic increase in cotton yield per acre in the Punjab since the mid-1980s. This yield increase has resulted from the rapid adoption of improved seeds and agronomic practices by Punjabi cotton growers. Improvements in pest management have been crucial in this regard.

The rapid expansion in cotton production fueled a similarly dramatic increase in cotton yarn production. Pakistan's yarn production doubled in volume during the second half of the 1980s. A phenomenal increase in spinning capacity has supported this growth in yarn output. The spinners of cotton yarn have been major beneficiaries of the GOP's cotton pricing policy. Yet, a recent study by the Asian Development Bank has noted that this increase in yarn production and exports has come at a high price in terms of economic efficiency and internal redistribution of wealth from cotton producers to spinners.

Recent years have also seen a significant increase in the production of cotton cloth. This increase has been supported by the proliferation of small-scale power looms, primarily in the Punjab. Recent estimates suggest that cloth output in this informal weaving sector is on the order of seven times the level of cloth output in the "sick" and declining formal sector. These power looms have also become an important source of small town employment.

The intensity of the battle over cotton price policy has increased since 1987, when the GOP relinquished its cotton export monopoly, allowing private traders to compete with textiles manufacturers for the cotton sold by ginners. Historically, the swings of GOP policy in favor of one group or another have been closely related to the interests of the political constituency of the government in power. The industrialists who had amassed great power during the 1960s under the Ayub Government suffered during the 1970s under Z. A. Bhutto's rule. The 1980s saw a more even compromise between competing cotton interests under the governments of General Zia and Benazir Bhutto.

Foreign exchange earnings, employment, value added, and fiscal revenue are the primary links between the cotton sector and the rest of Pakistan's economy. In recent years, raw cotton exports have accounted for 10 to 20 percent of Pakistan's total foreign exchange earnings, while cotton textiles earned an additional 40 percent. Thus, the cotton sector alone is the source of over half of the country's foreign exchange earnings.

Cotton-related activities are also a major source of employment and income. As many as 2.5 million farmers engage in cotton production. Moreover, the cotton textiles industry is the largest single source of industrial employment, absorbing at least 35 percent

of the industrial labor force. Cotton production is second only to wheat in its share of crop sector value added, while cotton textiles account for approximately 30 percent of industrial value added.

Within the agriculture sector, cotton's role as the leading cash crop creates important interactions with the food system. Cotton competes with wheat and other crops for land, labor, and other inputs. This competition is most direct in the case of wheat, which is often planted in rotation with cotton. Economic incentives are such that farmers often delay wheat planting in order to accommodate multiple cotton harvests, despite the measurable loss in wheat yields that results from that delay. In addition, cotton has tended to receive more than its share of crop research resources, at the general expense of food crop research.

1. INTRODUCTION

This report surveys Pakistan's cotton sector activities, from the production phase through textile exports, from independence to the present. The unifying theme for this study is the interaction of economics, technology, institutions, and politics as they relate to Pakistan's price and trade policies for cotton and cotton textiles.

Cotton is unique in its domination of Pakistan's economy. It is the country's leading cash crop, as well as the primary input to the country's largest industry. Cotton is thus intimately linked to the fate of both the Pakistani economy in general and its agriculture sector in particular. Cotton's macroeconomic linkages arise from its central role in generating foreign exchange, employment, fiscal revenue, and value added. At the sector level, cotton's linkages arise from its competition with alternative crops for land, labor, water, and other inputs. Consequently, any development programming relating to macroeconomics or agriculture in Pakistan must be conceived with a clear understanding of how it interacts with the cotton sector.

Taxation and protection of cotton and cotton textiles provide the central policy focus of this study. Pakistan exports raw cotton, yarn, cloth, and a variety of cloth manufactures. The specific composition of cotton sector exports is a function of public policies regarding export restrictions on various forms of cotton. The balance of cotton sector exports among cotton and alternative textile products has direct implications for the Government of Pakistan's (GOP) macroeconomic objectives and revenue, as well as rural welfare, and the relative fortunes of various groups of participants in the cotton sector.

The GOP's stated objectives are both to promote rural welfare and to maximize the value added in cotton sector exports. The principal means by which the GOP promotes the latter objective is by restricting exports of raw cotton, thereby ensuring adequate supplies of raw cotton to the domestic spinning industry. The logic of this policy is that yarn generates greater value added than raw cotton, and that greater yarn production will, in turn, promote the production of even higher value added downstream textiles.

The principal mechanism through which this policy operates, however, is the depression of domestic cotton prices resulting from the export restrictions. This effect directly *reduces* rural welfare in the cotton producing areas of Punjab and Sind provinces.

The evolution of Pakistan's cotton price and trade policies results from a complex interaction of shared and conflicting interests among various groups of participants in the cotton sector. These participants include growers, ginners, spinners, weavers and other "ancillary industries," private cotton exporters, a parastatal cotton trading corporation, and the GOP itself. Part of the objective of this study is to sort through the interaction of these interests as one means of explaining GOP cotton policy.

The stakes for these various participants in Pakistan's cotton sector have increased in recent years with the dramatic surge in cotton production. The rapid adoption of technical changes in cotton production has resulted in a virtual *doubling* of cotton production since the mid-1980s. This increase has also fueled rapid growth in some phases of textiles production. For instance, yarn production has also doubled over this period. Fortunately for Pakistan, its surge in cotton and textiles production has come at a time when world cotton demand is increasing more rapidly than world cotton supplies, as evidenced by an upward trend in world cotton prices.

Developments in Pakistan's cotton sector are thus the result of a complex interaction of economics, institutions, technology, and politics. This report seeks to convey a broad range of information regarding Pakistan's cotton sector in a conceptual framework which clarifies these interactions. The study is divided into two parts. Part I (comprising chapters two through five) presents economic and institutional perspectives on the GOP's cotton sector policies; Part II (comprised by chapters six through nine) provides a detailed description of the performance of Pakistan's cotton sector in terms of the production and exports of cotton and textiles.

Part I begins with the following chapter, which summarizes cotton's role in Pakistan's economy, highlighting both its macroeconomic and sectoral linkages. Chapter Three summarizes the GOP's cotton sector policies and analyzes their consequences both for the economy and for the various participants in the cotton sector. Chapter Four examines more closely the roles and interactions of the various cotton sector institutions involved in the continual tug-of-war over Pakistan's cotton pricing and trade policies. Chapter Five generalizes the preceding analyses by placing them in the broader context of Pakistani politics and seeking political economic explanations for GOP cotton sector policies.

PART I: ECONOMICS, INSTITUTIONS, AND POLITICS

Ch. 2 Cotton's Role in the Economy
Ch. 3 Cotton Sector Institutions: Rivalries and Alliances
Ch. 4 Cotton Sector Price and Trade Policy Interventions
Ch. 5 Political Economy Perspectives on Cotton in Pakistan

2. COTTON SECTOR'S ROLE IN THE ECONOMY

Cotton uniquely dominates Pakistan's economy. It is both the leading cash crop and the primary input to the country's largest industry. As such, cotton plays a significant role in both the macroeconomy and the agricultural economy of Pakistan.

2.1 Macroeconomic Linkages

Foreign exchange earnings, employment generation, fiscal revenue, and value added provide the primary linkages between cotton and the rest of Pakistan's economy. Figure 2.1 illustrates the role of cotton and textiles in Pakistan's foreign exchange earnings for 1988/89. In 1988/89, raw cotton exports accounted for Rs. 11,558 million, equivalent to 19 percent of Pakistan's total foreign exchange earnings.[1] That year, cotton textiles (narrowly defined as yarn, thread, and cloth) earned Rs. 14,252 million, or 23 percent of the country's total foreign exchange. Thus, the cotton sector (excluding garments) accounted for 42 percent of the country's total foreign exchange earnings in 1988/89.[2] That same year, raw cotton accounted for 61 percent of total foreign exchange earnings from primary commodities, and textiles contributed 75 percent of the total foreign exchange earnings from manufactured goods.

The cotton sector is also a major source of employment for Pakistan. There are some 2.5 million cotton farmers in Pakistan, each of whom would tend to hire some labor in addition to themselves, at least for cotton picking.[3] Indeed, cotton picking is done exclusively by hand, and almost entirely by women. In addition, the textiles industry

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[1] Economic Survey, 1988-89

[2] Garments are excluded to be conservative, since not all garments are cotton, and the statistics do not differentiate.

[3] Asian Development Bank (1987)

employs over 35 percent of the industrial labor force, making it the largest single source of industrial employment in the formal sector. Informal sector cloth weaving operations are estimated to employ on the order of 220,000 people in addition to those counted in the official statistics.[4]

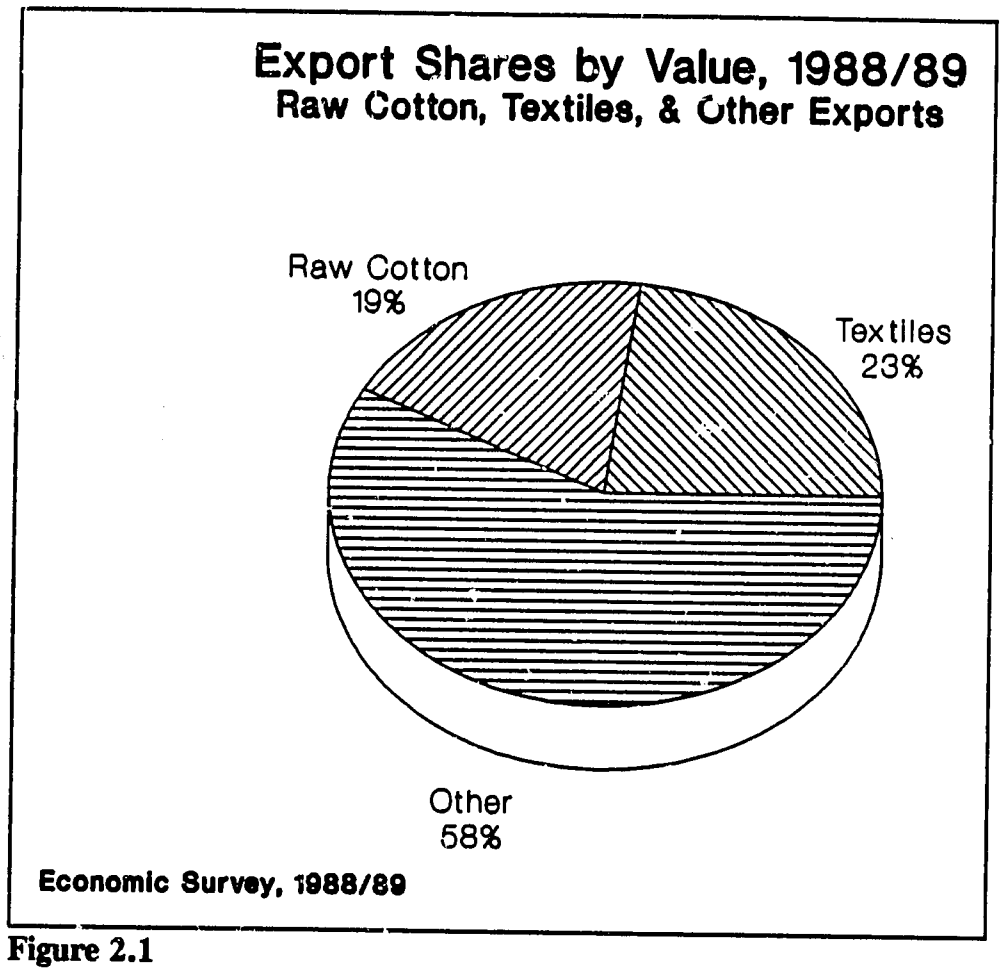

Figure 2.1

In addition to its role as a major source of foreign exchange and employment, the cotton sector is also an important source of revenue for the GOP. In recent years, the most important revenue stream flowing from the cotton sector has been the export duty on raw cotton. In 1990/91, this source yielded over Rs. 3 billion in revenue from yarn export taxes. The 1991/92 budget has significantly increased the export and excise duties on cotton yarn. As a result of this increase, the All Pakistan Textiles Mills Association (APTMA) estimates that the GOP will collect Rs. 3 billion, an amount equivalent to one-half of the projected Rs. 6 billion fiscal deficit.[5]

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[4] Extrapolated from Powerloom Survey, Government of Punjab, Directorate of Industries and Minerals (1987)

[5] APTMA (1991)

Cotton also makes a significant contribution to value added in the economy. Textiles currently account for approximately one-third of industrial value added.[6] At the same time, among all crops, cotton is second only to wheat in its share of crop value added, to which cotton contributes over one-fourth.[7] Cotton also plays a dominant role in terms of its other interactions on the sectoral level.

2.2 Sectoral Linkages

Cotton is the leading cash crop in Pakistan; it dominates agricultural exports and is the main input to Pakistan's leading industrial sector. Cultivated almost entirely in the Indus Basin (e.g. Punjab and Sind provinces), cotton production in Pakistan has been traced back at least 5,000 years.

Only wheat surpasses cotton in cultivated area. In 1989/90, cotton covered approximately 2.6 million hectares, or 13 percent of total cultivated area (compared with 38 percent under wheat and 10 percent under rice).[8] Nearly all of this production benefits from one of the world's largest irrigation systems. Cotton production in 1989/90 was 1.45 million metric tons (or 8.55 million Pakistani bales[9]), with average yield estimated to be 559 kilograms per hectare (or 51,554 maunds per acre).[10]

As in any production environment with multiple outputs and limited inputs, cotton competes with other crops for land, water, and labor. Cotton is a kharif (summer) crop which is planted beginning in May and harvested through January of the following year. Other kharif crops include rice, sugarcane, and maize. Wheat is the principal rabi (winter) crop, along with oilseeds.

While it is natural to think that the most serious competition for cotton would be other kharif crops, in actuality the most significant competition is between cotton and wheat. Nearly half of Pakistan's wheat crop is grown in rotation with cotton.[11] The conflict, then, comes in the wheat-cotton rotation when farmers extend the cotton harvest past the optimal sowing date for the wheat which follows it.

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[6] World Bank (1982), p. 1

[7] Economic Survey (1988-89), Table 3.6

[8] Economic Survey, 1989-90

[9] 1 Pakistani bale = 375 lbs. = .17 metric tons

[10] PCCC, Pakistan Cotton Statistics, table 1

[11] Byerlee (1986)

Surveys have shown that nearly all wheat that follows cotton was planted late. The optimal planting date for wheat in all areas is the last three weeks of November; yet, one survey found that 20 percent of the wheat crop in wheat-cotton rotations was planted in January. The cost to the wheat yield is quite direct: one study found that each day's delay costs 30 to 45 kg/acre in the Punjab.[12]

The explanation for this practice lies in relative crop prices. A recent study has calculated that the returns to a third cotton picking are more than twice the value of the potential wheat yield foregone through late planting.[13] Recent increases in cotton yields due to growing pesticide use on small farms has further aggravated the cotton-wheat competition.

The results must be interpreted in light of GOP wheat pricing policies, which significantly depress the farmgate price of wheat, and thus limit wheat production incentives relative to cotton (though, as Chapter Four relates, policy also acts to depress cotton prices). Nonetheless, this inter-seasonal competition has provided an incentive for current research into agronomic practices regarding the sowing of wheat while cotton is still in the ground. Research is also being devoted to developing earlier maturing cotton varieties.[14]

In the Sind, there is direct competition between sugarcane and cotton within the summer growing season. In contrast to cotton (as is discussed at length in Chapter Four), sugarcane is protected by GOP trade policy. This has created an incentive for Sindi farmers to substitute sugarcane for cotton. This trend is reinforced by the fact that sugarcane production is less labor-intensive and less vulnerable to pests and disease than cotton.[15]

2.3 Structure of the Cotton Sector

The cotton sector incorporates five levels of activities: growing seed cotton, ginning (the process which separates the lint from the seed), spinning yarn and thread, weaving cloth, and dying/finishing/garmenting.[16] Figure 2.2 presents a flow chart summarizing cotton marketing channels. At each stage of the system (after ginning), the output is either exported in its current form or passed up the value-added chain.

The circled numbers in Figure 2.2 are the approximate quantities produced at each of the relevant levels of the system during 1990/91. The percentage figures next to the arrows

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[12] Ibid.

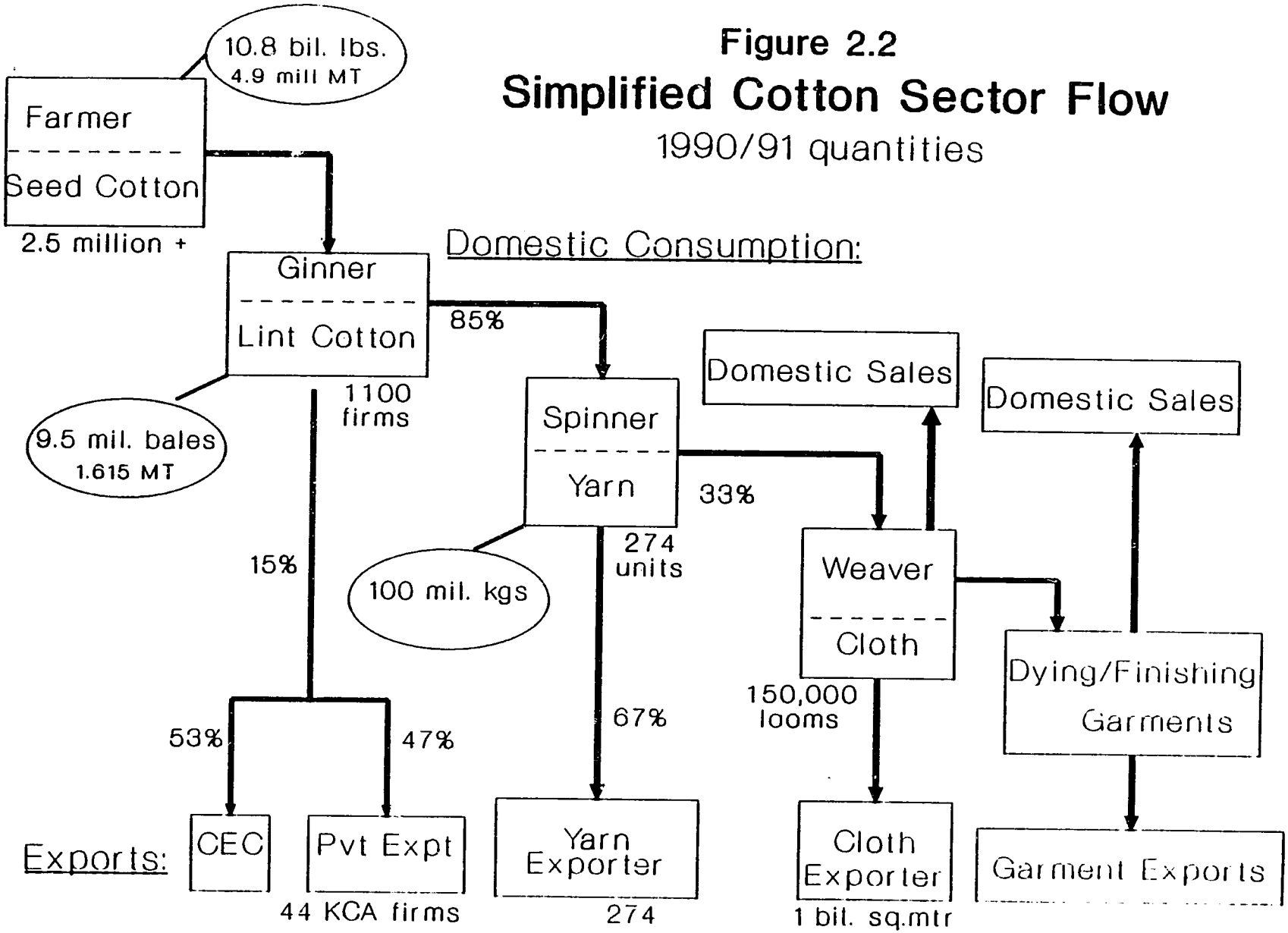
[13] Cited in Byerlee, et. al. (1986)

[14] See Chapter Nine for greater detail on crop research activities.

[15] Interview with Husaini Jagirdar, Applied Economics Research Center, University of Karachi, July 2, 1991.

[16] This study does not cover the sector past the weaving stage in any detail.

Figure 2.2
Simplified Cotton Sector Flow
1990/91 quantities



Source: Block, Abt Associates

reflect the share of the output from each box flowing in the direction indicated. The numbers outside the border of the boxes indicates the number of firms operating in 1990/91 at each level of the system. For example, total lint cotton production for 1990/91 was 9.5 million Pakistani bales (of 375 lbs), which was the output of approximately 950 ginning factories.[17] Of this lint, approximately 85 percent was consumed by domestic spinning mills and the remaining 15 percent was exported as raw cotton. Of those exports, just under one-half passed through private channels and just over one-half was exported by the state-owned cotton trading organization.[18]

Capacity in each part of the cotton sector has increased at an accelerated pace since the mid-1980s surge in cotton production. In 1980/81, there were 627 ginning factories in Pakistan, with a total capacity of 11 million bales.[19] By 1990/91, the number of ginning factories had grown to 1100 -- a 75 percent increase.[20]

Improvement in the quality of ginning operations has been seen as a fundamental requirement for development of the cotton sector. A major study in the late 1970s, observing that poor maintenance of outdated ginning equipment contributed to a low quality of ginning and deterioration of the cotton, called investment and improvement of ginning the "very top priority" for the cotton sector.[21] Yet, a 1986 study reported that there had been little improvement in the ginning process since the first saw gins were introduced in 1918. That study identified the lack of pre-cleaning equipment as the principal culprit in reducing ginning quality.[22]

The textiles industry is divided between the formal mill sector and the informal power loom sector.[23] The large-scale mill sector concentrates its activities on spinning, while the power loom sector concentrates on weaving. The textile sector tended to consume approximately one-half of total domestic cotton production up to the late 1980s. In 1987/88, the mill sector consumed 4.235 million bales of cotton, out of total domestic production that

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[17] Approximately 150 ginning factories were idle in 1990/91, according to representatives of the Cotton Ginners Association.

[18] The domestic consumption of 85 percent of lint cotton output is a recent phenomenon, which, as described below, resulted from the rapid growth of the spinning sector in recent years. The level was closer to 50 percent in the mid-1980's.

[19] Cotton Handbook of Pakistan (1983), Appendix III

[20] Interview with Cotton Ginners Association, Multan, July 4, 1991

[21] Werner International (1979), p. 164

[22] Asian Development Bank (1986), p. 16

[23] Chapter 7 elaborates on this distinction.

year of 8.633 million bales, or 49 percent. The following year, the share increased to 59 percent, and in 1989/90 and 1990/91, textiles mills consumed roughly 85 percent of total cotton production.

The dramatic increase in the share of Pakistan's cotton production consumed domestically reflects the rapid increase in spinning capacity which occurred in the late 1980s. Since 1985, 114 new spinning operations have come into production, representing a 71 percent increase in the number of firms. During that same period, 1 million new spindles have come into production (a 25 percent increase), and capacity utilization has increased 20 percent in the spinning industry.[24]

The precise size of the power loom sector is unknown. These are small establishments scattered widely throughout the Punjab in particular. A 1990 survey by the Government of Punjab estimated that there are over 100,000 powerlooms in operation. Employment in the power loom sector is also unknown, though estimates range from 150,000 to 225,000.[25] Trends in textile production capacity are discussed in greater detail in Chapter Seven.

The following chapter presents the main cotton sector price and trade policy interventions taken by the GOP, as well as an overview of the historical evolution of those interventions and an analysis of their effects.

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[24] Asian Development Bank (1991), p. 162

[25] Ender (1990), p. 13

3. COTTON SECTOR INSTITUTIONS: RIVALRIES AND ALLIANCES

Pakistan's cotton price and trade policies reflect a compromise between the interests of various participants in the sector. The main groups of participants in the sector, in addition to the Government of Pakistan, include: growers, ginners, private exporters of raw cotton, yarn spinners and exporters, weavers and other textiles manufacturers, and end users of garments. In particular, two powerful lobbies representing raw cotton exporters on the one hand (the Karachi Cotton Association), and cotton spinners on the other (the All Pakistan Textile Mills Association), engage one another in continual battle over the composition of cotton sector exports.

To the extent that public policy intervenes to restrict raw cotton exports, textile manufacturers enjoy a subsidy on their primary input. Thus, GOP cotton pricing, marketing, and export policies provide the arena in which this battle is fought. The GOP serves as the arbiter of this battle, though the GOP is not a neutral party to the debate. The GOP must consider, not only the interests of APTMA and the KCA, but it must also take account of the other cotton sector participants, as well as its own complex and sometimes conflicting economic and political interests.

This chapter first sorts out the various institutional rivalries and alliances that arise from the interests of each set of participants in the cotton sector (including the GOP), and then examines the role and performance of the state-operated cotton trading company, the Cotton Export Corporation (CEC).

3.1 Rivalries and Alliances Among the Private Trade Associations

Each of the groups of private sector participants in the cotton sector are represented by trade organizations. The most influential of these groups are the All Pakistan Textile Mills Association (APTMA), and the Karachi Cotton Association (KCA). Other such organizations include the Cotton Ginners Association, and a variety of groups representing segments of the ancillary industries, such as the Bedwear Exports Association, the Pakistan Hosiery Manufacturers Association, and the Towel Manufacturers Association. Each of these groups exists primarily for the purpose of lobbying the GOP to adopt cotton price and trade policies favorable to the interests of their members.

The interests of these individual groups give rise to shifting alliances and rivalries, depending on the particular issue at stake. The broadest division arises with regard to the issue of whether (or how, or how much) to restrict exports of raw cotton. The underlying issue is protection of the domestic textile industry, which benefits from the reduced domestic lint cotton prices that result from export restrictions. One side of this issue finds an alliance between the KCA, cotton growers (many of whom are influential landlords), and ginners, who share an interest in eliminating cotton export restrictions. Recent articles in *The News*

(Karachi edition) by a representative of the KCA refer to restrictions on cotton exports as a "fiscal anomaly" from which "the cotton economy should be unshackled."[26]

APTMA and the ancillary industries, on the other hand, argue that *no* raw cotton should be exported. They lay claim to greater value added than is created by raw cotton exports, as well as greater employment generation.[27] In his annual address, the APTMA chairman lauded the GOP for its "...far-sighted Cotton Policy, whereby the windfall profits on the export of Cotton are mopped up by the Government so as to avoid the inflationary impact of such huge funds passing into the hands of the spend-thrift feudal lords."[28] Both sides claim that their interests coincide with the national interest.

These alliances break down, however, as the issue at hand changes. For instance, although the spinners and the ancillary industries agree that the national interest lies in permitting no exports of raw cotton, they are continually at odds over whether or not a similar policy should exist for cotton yarn. The ancillary industries would like the same implicit subsidy for their primary input (yarn) that the spinners enjoy on raw cotton. The specific issues pertain to yarn export and excise duties.

Referring directly to the APTMA chairman's reference to "spend-thrift feudal lords," the ex-chairman of the Pakistan Bedwear Exporters Association remarks, "...we also want the windfall profits of the spinners to be mopped up, not because we are envious of their prosperity but in the larger national interest."[29] In another article published on the same day, the Chairman of the Towel Manufacturers Association called upon APTMA to recognize that "What is sauce for a goose is sauce for a gander." He goes on to demand that "...not a single ounce of yarn, particularly of good quality be exported till such time [as] the local requirements are met, but the Government will not do it because the spinners are their 'blue eyed babies'."[30] The ancillary industries claim that the spinners are exporting the high quality yarn at low prices, and selling them poor quality yarn at high prices.

For its part, APTMA blames the problems of the ancillary industries on those industries themselves. The Chairman counters that "The ancillaries want that this superior quality yarn should also be made available to them at the price of poor quality yarn...They

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[26] Articles by Dr. Zafar Hassan, *The News*, February 11, 1991, and April 20, 1991.

[27] The Asian Development Bank (1991) questions these claims.

[28] Speech by Mian Jehanfir A. Monnoo, Chairman, APTMA, June 29, 1991, reprinted in the Chairman's Review.

[29] Article by Shabir Ahmed, *Dawn*, June 29, 1991

[30] Article by S.M.A. Rizvi, *Dawn*, June 29, 1991

are unable to pay the necessary premium because they have not modernized their own equipment..."[31]

On the other side of the market, the alliance between the KCA, ginners and growers, cited above, dissolves over the issue of cotton spot market prices, which the KCA is publicly mandated to determine on a daily basis. Ginners and growers, in the past, have accused the KCA of fixing raw cotton spot market prices artificially low in order to enlarge their own export margins. Similarly, this alliance between the ginners and the growers against the KCA disappears when the growers make the same charge against the ginners with regard to seed cotton prices.

3.2 GOP Interests in the Cotton Sector

These battles are fought in the arena of GOP cotton price and trade policy. Thus, it is left to the Government to mediate among the conflicting interests of various cotton sector actors as they align and realign themselves on particular policy questions. Yet, the GOP itself has much at stake in the shape of its cotton policies, and thus is not a neutral moderator among the combatants. The GOP has both economic and political interests that are quite sensitive to cotton policy.

The GOP's economic interests lie in promoting high and stable levels of foreign exchange earnings, employment, and value added. These incentives tend to push the GOP towards restricting both cotton and, to some extent, yarn exports (assuming that export quotas on higher value added items are not so low as to undermine the export potential). This tendency is reinforced by the GOP revenue motive. As noted in Chapter Two, export duties on raw cotton and yarn have the potential to compensate for a large share of the fiscal deficit.

The GOP also has an interest in promoting rural welfare. Yet, the interests of growers are clearly in having no restrictions on raw cotton exports, since such interventions drive cotton farmgate prices below export parity prices, and thus impose an implicit tax on growers.

In fact, the GOP's interest in promoting rural welfare is partially a political consideration, as well as an economic goal. All governments have an interest in self-preservation. Thus, the incentive exists to shape policies in such a manner as to favor the interests of influential constituent groups. As Chapter Five describes in detail, the political history of Pakistan yields several clear insights into the formation of the GOP's cotton sector policies. In particular, different governments have been aligned with various combinations of landed interests, industrialists, urban labor, and the army. These alliances, as discussed

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[31] Speech by Mian Jehanfir A. Monnoo, Chairman, APTMA, June 29, 1991, reprinted in the Chairman's Review.

below, have sometimes been translated into cotton price and trade policies. Since 1974, the principal body through which the GOP has implemented its cotton sector policies has been the parastatal Cotton Export Corporation.

3.3 Cotton Export Corporation

The Cotton Export Corporation (CEC) was chartered as an agency of the Government in 1973 and given a monopoly over Pakistan's cotton exports. From 1974/75 until 1986/87, the CEC was thus the sole legal exporter of Pakistani cotton. Prior to 1973, cotton exports had been the exclusive domain of private traders, with most activity concentrated in the Karachi Hedge Market (one of the world's few cotton futures markets). By most accounts, the private traders' questionable business practices had severely tarnished Pakistan's image in international cotton markets.

The proximate cause for the termination of private cotton exports in 1973 was the widespread failure of private traders to honor their export commitments when world cotton spot market prices soared above the levels at which the Pakistani traders had promised delivery. The first chairman of the CEC justified the nationalization of cotton exports in response to this massive default, writing,

> The fabric of international trade is woven with the fibers of mutual trust, confidence, fairplay and goodwill. Any one who deliberately or unwittingly cuts across these fibers will ultimately destroy the fabric itself....Government was thus forced to step in. It was left with no alternative but to take away the export of cotton from those hands which had abused it. This is how the CEC came into being charged with the responsibility of restoring the rudely shaken confidence of the foreign buyers...[32]

The CEC serves as the primary institution through which the Government implements the cotton sector policies described in the following chapter. The main tenets of the CEC's stated mission, however, are not fully consistent with the policy outcomes seen above. In addition to the goal of restoring Pakistan's reputation in international cotton markets, the CEC was ostensibly organized to promote the interests of cotton growers and to improve the quality of ginned (lint) cotton.

In practice, the CEC's implementation of a support price for lint cotton served effectively to impose a relatively low and stable ceiling on lint cotton costs to the textile industry. Moreover, the CEC export monopoly, by exporting even at an occasional loss in domestic currency, has helped to stabilize the inflow of foreign exchange. This was also an effect of propping up the textile industry through subsidized domestic cotton prices. Indeed, one of the major goals of CEC operations has been to assure the textile industry adequate

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[32] Article (undated) by Nusrat Hasan, Chairman, CEC, reprinted in Werner International (1979), p. 591

cotton supplies at less than international prices. On rare occasions, the CEC even sold its lint cotton directly to cotton mills.

Government control of the quantity of raw cotton exported has been one of its primary means of managing the domestic cotton price. Prior to the adoption of the benchmark/MEP price system (described in the following chapter), the CEC's typical practice was to refrain from entering the lint cotton market until December, approximately two months after the newly harvested cotton hits wholesale markets. Those two months would be the time allotted domestic spinners to enter the market to meet their needs. Only then would the CEC enter the market to purchase the residual lint cotton supply for export. In years when export demand and price are low, the CEC is still obliged to purchase lint cotton from ginners at the official support price. If the quantity available exceeds what can be exported, the CEC must add the residual to its stocks.

When it still held the export monopoly, the CEC typically purchased 40 to 60 percent of the total cotton harvest. Specifically, for the last five final crop years of its monopoly (from 1983/84 through 1987/88), the CEC procured respectively 8.5 percent, 50 percent, 61 percent, 46.5 percent, and 42.7 percent of total cotton production.[33]

The CEC appears to have succeeded in restoring Pakistan's image in world cotton markets. In 1986/87, for example, when international cotton prices rose much more than anticipated, the CEC fulfilled its contracts to export cotton at a price significantly lower than the spot market prices. This resulted in a large financial loss for the CEC, but helped to bolster international confidence in Pakistan as a supplier of cotton.

Similarly, there were instances in other years when the CEC had promised to deliver a certain grade of cotton, and ultimately delivered a higher grade when the original proved unavailable. Yet, the fairness of this implied comparison with the earlier practices of private traders is limited by the fact that CEC losses were covered by the Government, while those of the private traders were not.

Indeed, the CEC had gross operating losses in nine out of its first fifteen years of activity, from 1973/74 to 1987/88. Figure 3.1 summarizes the before tax profits and losses of the CEC.[34] Net losses during the CEC's first fifteen years of operation were Rs. 3.659 billion. In addition, from 1973/74 to 1987/88, the CEC paid the Government a total of Rs. 5.962 billion in export duties and taxes, and received Rs. 4.959 billion in subsidies.[35] On a net basis, then, from 1973/74 to 1987/88, the CEC made net positive payments of Rs. 1 billion to the GOP. Yet, this must be weighed against the Rs. 3.659 billion in "corporate"

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[33] The low figure for 1983/84 reflects that year's exceptionally poor cotton harvest.

[34] Agricultural Prices Commission (APCOM), (1990), vol. 1, ch. III

[35] APCOM (1990), vol. 1, p. III-106

losses, which were in effect government losses. As Ender notes, however, the CEC was also responsible for several developmental activities, for which the GOP had other reasons to transfer funds to and from the corporation.[36]

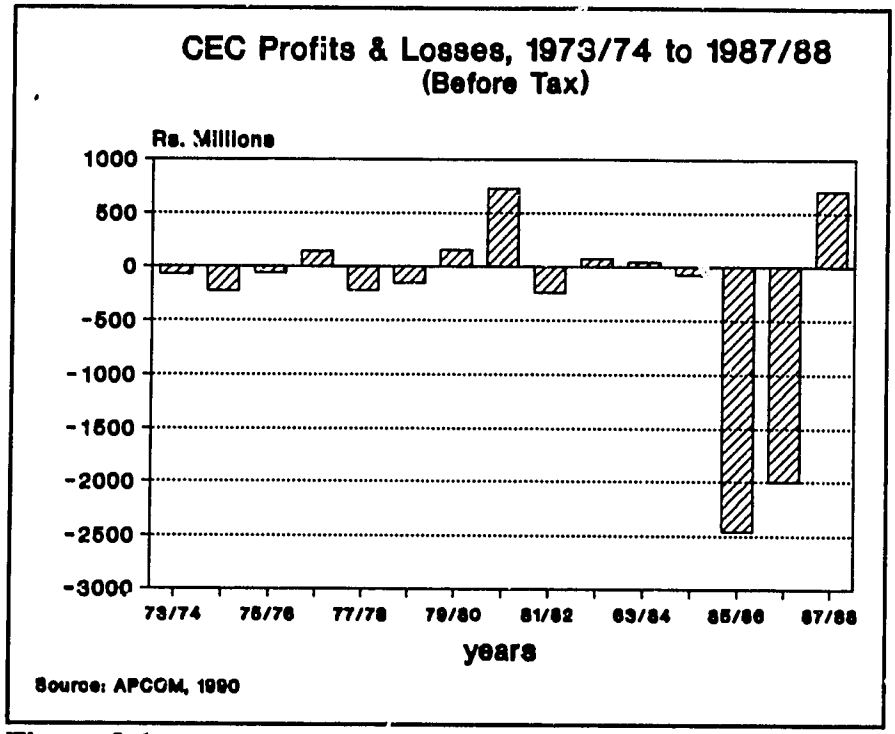


Figure 3.1

1985/86 and 1986/87 saw a rapid fall in world cotton prices, resulting in the CEC's total losses during these two years of Rs. 4.5 billion. In a typical year, the CEC lost Rs. 244 million.

Ultimately, the CEC served to ensure foreign exchange earnings, even at a loss in rupees. Figure 3.2 illustrates the CEC's foreign exchange earnings (in rupees) from 1973/74 to 1988/89. The large increase during 1985/86 reflected the same jump in raw cotton prices that caused the huge operating losses shown in Figure 3.1.

The following chapter examines the cotton sector price and trade policies that emerge from the institutional struggles described above.

[36] Ender, op. cit., p. 18

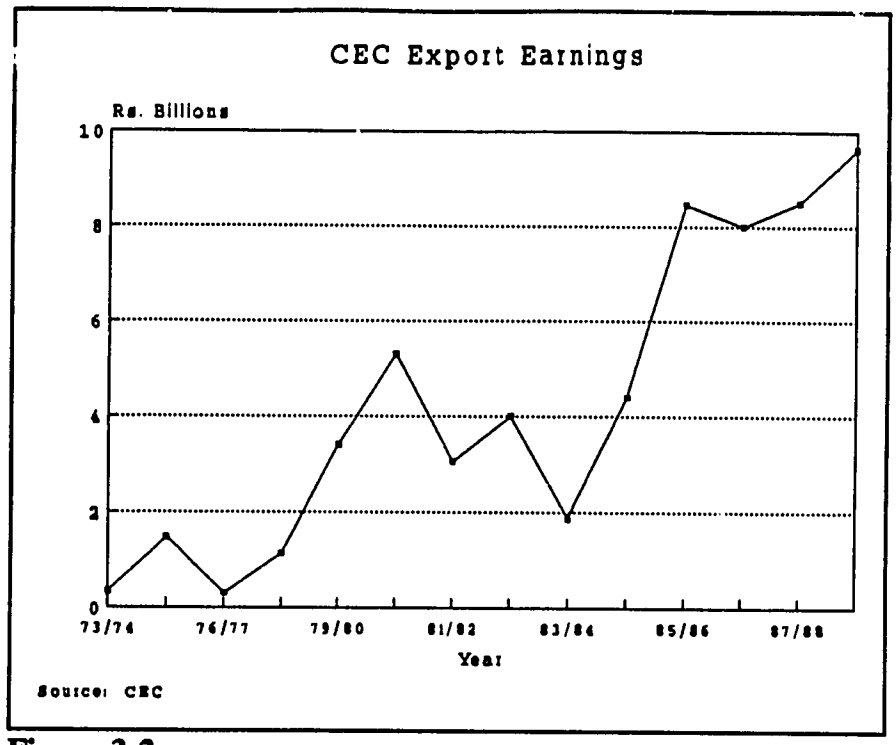

CEC Export Earnings
Rs. Billions
10
8
6
4
2
0
73/74
76/77
79/80
81/82
83/84
85/86
87/88
Year
Source: CEC

Figure 3.2

4. COTTON SECTOR PRICE AND TRADE POLICY INTERVENTIONS

This chapter addresses the evolution of the Government of Pakistan's economic policy interventions affecting production and export of cotton and cotton textiles. The range of interventions includes macroeconomic policy (principally exchange rate policy), commercial policies (principally commodity-specific trade taxes), and other commodity-specific price policy interventions relating to input and output prices in the cotton and textile sectors.

The GOP has developed a complex and often changing set of policies which affect the cotton sector. This network of interventions includes a variable levy on raw cotton exports, floor prices for cotton farmers and ginners, a price ceiling and a vaguely defined quantitative target for raw cotton exports, a minimum price for export contracts, yarn export and excise taxes, and high rates of protection against textile imports. In addition, from 1972 until 1987, the GOP monopolized cotton exports through a parastatal company that now competes with private cotton exporters. The net result of this complicated web of interventions has been to tax cotton producers and exporters, to the direct benefit of the textile industrialists, spinners in particular.

The following section presents an overview of the GOP's current system for cotton pricing and export policy. Subsequent sections of the chapter review the GOP's macroeconomic policy interventions that bear upon the cotton economy, summarize various measures of the effects of these interventions, describe specific interventions in the textile sector, and assess the net costs of the full set of cotton sector interventions.

4.1 Overview of Present Cotton Sector Pricing Policy

4.1.1 Price Support System

The first level of public price intervention is at the farmgate, through a system of support prices for seed cotton. In principle, the seed cotton support price governs sales from farmers to ginners. The support price system began in 1972/73, before which time cotton prices were determined by the market. Support prices for the different varieties of cotton since that time are listed in Table 4.1. The GOP is responsible for announcing support prices for the coming season prior to planting time, in order to reduce producer price risk. If the post-harvest market price drops to the support price level, the government is obliged to buy from producers at the support price.

Determination of the seed cotton support price is the domain of the Agricultural Prices Commission (APCOM). (Lint cotton support prices are determined by the Ministry of Commerce.) In general, APCOM includes the following considerations in determining seed cotton support prices:

1) Cost of Production;
2) Comparative advantage of cotton with competing crops;
3) Domestic prices of lint cotton;
4) Export parity prices of local cottons;
5) Prices of seed cotton relative to domestic yarn prices; and
6) Export parity price of seed cotton in the basis of Pakistan cotton yarn prices at Hong Kong.

Table 4.1 Cotton Support Prices (Rs./40 kgs.)

Varieties:	Desi		A.C. 134		B-557 & 147		Sarmast & Deltapine	
Year	Seed ctn	Lint ctn	Seed ctn	Lint ctn	Seed ctn	Lint ctn	Seed ctn	Lint ctn
1972/73			42.87					
1973/74			97.52					
1974/75			87.88					
1975/76			120.03					
1976/77	128.60		133.96	434.04	144.68	482.26	155.40	525.13
1977/78	141.46	359.00	147.87	359.00	159.68	415.82	171.47	451.18
1978/79	143.61	369.74	147.87	389.00	159.68	424.39	171.47	459.97
1979/80	143.61	375.00	147.87	410.46	159.68	445.88	171.47	481.19
1980/81	156.00	409.38	160.00	442.61	171.00	475.80	182.00	509.00
1981/82	166.00	419.00	170.00	449.00	178.00	478.00	182.00	515.00
1982/83	168.00	419.00	175.00	449.00	183.00	478.00	197.00	515.00
1983/84	169.50	426.40	178.00	471.60	186.00	496.00	200.00	538.00
1984/85	169.50	426.40	181.00	476.80	189.00	500.40	203.00	542.27
1985/86	173.50	426.40	185.00	476.80	193.00	500.40	207.00	542.27
1986/87	173.50	426.40	185.00	476.80	193.00	500.40	207.00	542.27
1987/88	173.50	428.00	185.00	480.00	193.00	504.00	207.00	546.00
1988/89	176.50	431.00	188.00	483.00	196.00	507.00	210.00	549.00
1989/90	191.50		203.00		211.00	502.94	225.00	512.13

Source: Food & Agriculture Division, quoted in Report of the Senate Sub-Committee on Current Cotton Policy of Government (May 10, 1990)
1972/73 - 1976/77 from Adams & Iqbal (1983), p. 155

The precise manner in which APCOM combines these factors to determine the seed cotton and lint cotton support prices in a given year is unclear. What is clear, however, is that producers have been unhappy that support prices have been consistently and significantly below both domestic and international cotton market prices.[37]

[37] This attitude on the part of producers is reported in Government of Pakistan, Senate Sub-committee on Current Cotton Policy, (1990), p. 4.

In recent years, domestic market prices have remained significantly above the seed cotton support prices, obviating the need for government purchases. Figure 4.1 records seed cotton support and wholesale prices at Multan since 1981/82. Over this period, the GOP has succeeded in establishing support prices at levels consistently below the wholesale market price, making CEC purchases for seed cotton stock virtually unnecessary.

A similar situation has pertained for lint cotton support and wholesale prices. As a result, the perception of many cotton observers is that the support price system has not played a large role as a production incentive, though it is said to provide psychological assurance to the growers.

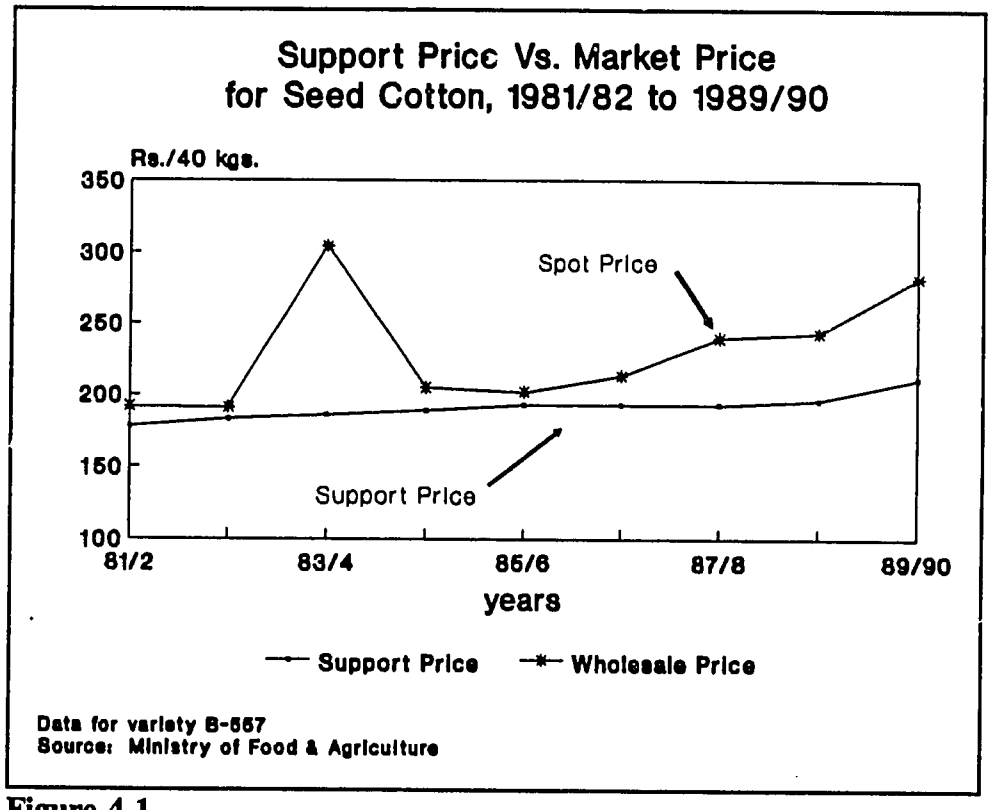


Figure 4.1

While the GOP relies on fiat to enforce its seed cotton support price policy, the ex-gin floor price can be defended by public procurement of lint cotton by the CEC. While the floor price is usually safely below the cotton spot prices, the CEC did defend the ex-gin floor price in 1985/86, when world cotton prices plummeted. In normal times, however, ginners pay "market" prices for seed cotton, and sell lint at "market" prices. The critical feature of the system is that those "market" prices are held artificially below f.o.b. export parity prices by the GOP's export price policies.

4.1.2 Raw Cotton Export Price Policy

The GOP's current cotton export price policy is built around two policy prices: the benchmark price and the Minimum Export Price (MEP). The benchmark price serves as a ceiling price for cotton exporters. Yet, this is not the price at which exported cotton actually leaves the country. The GOP also fixes a daily MEP, which is the minimum price at which it will approve cotton export contracts on that day.

The MEP is fixed each day at 3 p.m. by a meeting of an inter-agency committee of the Cotton Board, and is valid until 2:30 p.m. the following day. The committee consists of representatives of various cotton sector institutions (described in Chapter Four), Government agencies, and the State Bank of Pakistan. Their considerations in setting the MEP include an assessment of the local crop and market conditions, as well as an examination of the New York cotton future prices (of the nearest three dates), the West Texas spot price for coarse cotton, the A and B index prices in Liverpool, and the SMPN (Japan) futures price.

The MEP is always well above the benchmark price. Thus, the exporter receives the benchmark price; yet, the cotton is actually sold abroad for at least the MEP. The difference between the MEP and the benchmark price accrues to the GOP as a unit export duty on cotton. Figure 4.2 shows in a stylized manner the relationship between the benchmark, spot, and minimum export prices. The left-hand panel shows the relationship at the start of a "typical" season. At that time, the benchmark price is below the spot price, making it impossible for exporters to purchase cotton on the market and export it at a profit. To the extent that the MEP approximates the relevant world price of cotton, the difference between the MEP and the spot price (at which spinners purchase lint) approximates the unit subsidy to spinners. Later in the season, as described below, the situation resembles the right-hand panel of Figure 4.2.

The benchmark price system, which began in 1988/89, is the principal tool with which the GOP restricts raw cotton exports. Its objective in restricting exports is to depress the domestic price of lint cotton, thus enabling the domestic spinning industry to acquire its primary input at anywhere from 15 to 40 percent below the relevant world price. *This suggests a welfare transfer from cotton growers and ginners to yarn spinners.*

The benchmark system has the effect of eliminating cotton exporters from the lint cotton market, effectively making cotton a non-tradable commodity. This leaves the entire market, at least temporarily, to the textile mills. The GOP sets the benchmark price at a level below its prediction of domestic spot market prices, thus eliminating exporters from the market by creating a system in which they would have to export at a price *below* what they paid to procure the cotton. With the domestic market effectively severed from the international cotton market, the textile mills are able to purchase lint cotton at local spot market prices well below the world price.

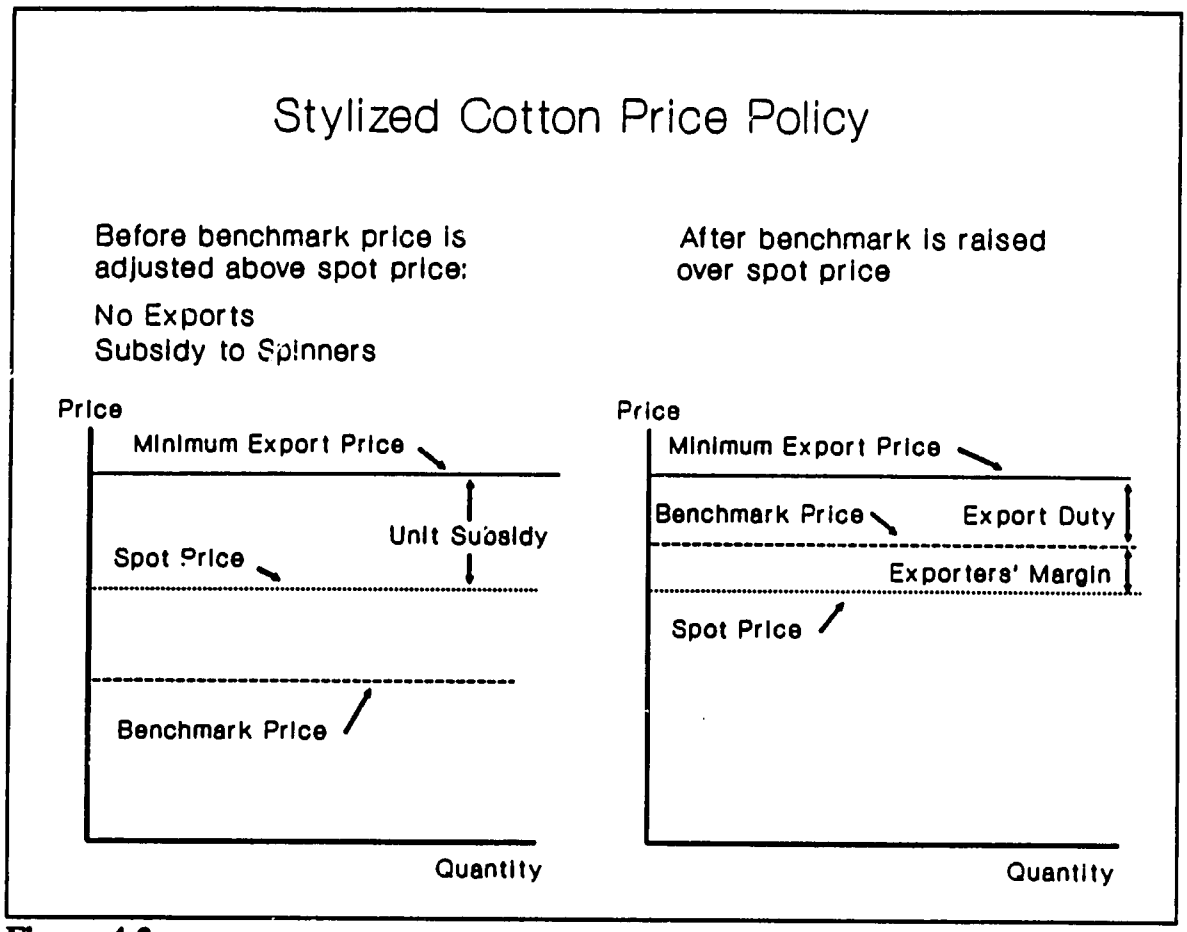


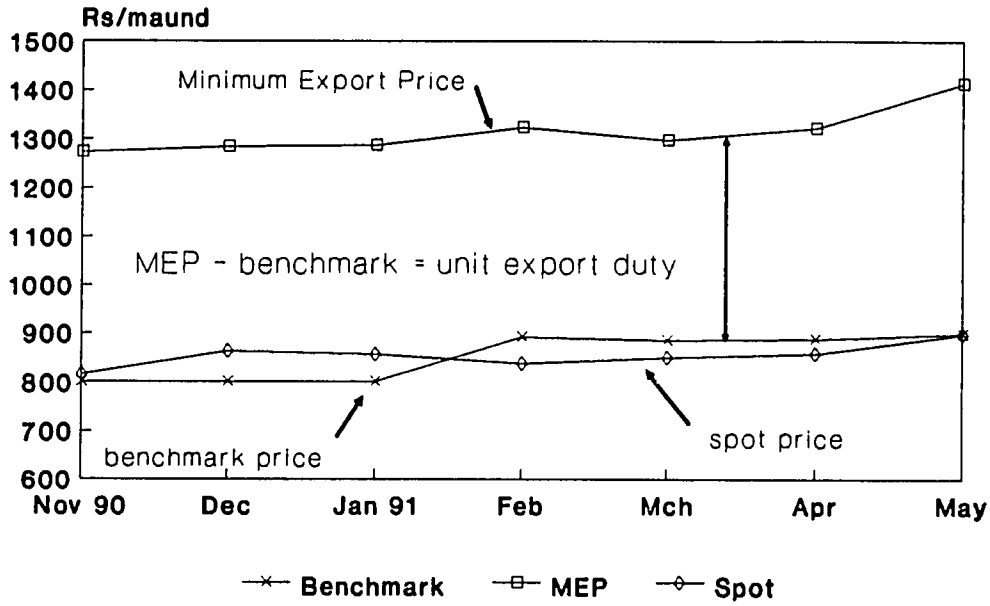
Figure 4.2

Once the GOP perceives that the textile mills have satisfied most of their lint cotton needs for the season, the experience of the past three years has been that the GOP then revises the benchmark price upwards to a level greater than local spot prices. At this point, typically in mid-season, exporters enter the lint cotton market, and earn the difference between the revised benchmark price and the spot price as their margin.[38]

Figures 4.3 and 4.4 illustrate the relationship between prices and demonstrate their effects on monthly purchases by different segments of the cotton sector for 1990/91. Figure 4.3 shows the magnitude of the export duty as the difference between the MEP and the benchmark price. On February 5, 1991, the GOP judged that the textiles mills had met most of their demand for lint, and revised the benchmark system. This year, rather than simply raising the benchmark price above spot prices as it had in 1989/90, the GOP announced that

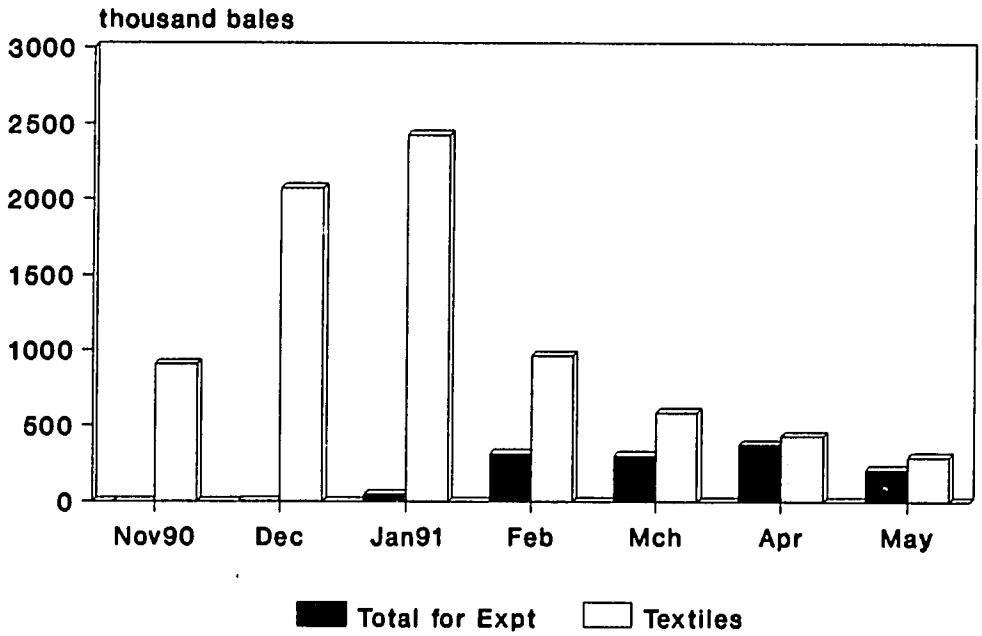
[38] In 1988/89, the GOP wanted to encourage early season raw cotton exports, and thus set the benchmark price at a high enough level to make exporting profitable. When the export target had been reached, the GOP shut off raw cotton exports by simply ceasing to announce an MEP, thus halting the approval of export contracts (as of February 26, 1989). This was in contrast to subsequent years, when the benchmark price was used to exclude exporters from the market until *after* the spinners had met their needs.

Figure 4.3
Cotton Policy Prices, 1990/91



1 maund = 37.32 kg
Source: KCA

Figure 4.4
Monthly Purchases, 1990/91



Source: CEC

it would rebate 20 percent of the export duty back to the exporters. Since the benchmark price up to that point had been fixed at Rs. 800 per maund, this revision effectively raised the benchmark price to approximately Rs. 900 per maund.[39] Figure 4.4 demonstrates the effect of this mid-season revision on monthly purchases by textile mills and exporters (for which total exporter purchases is the sum of CEC and private purchases). It is clear from Figures 4.3 and 4.4 that adjustment of the benchmark price in February drew exporters into the market and signaled the gradual withdrawal of the mills.

The benchmark system was introduced to accommodate the re-entry of private exporters to the market. As Chapter Three explained, the GOP created the CEC in 1973 and nationalized cotton exports. The CEC monopoly lasted from 1973/74 until 1987/88. During this time, the same objectives of subsidizing the spinning industry by restricting raw cotton exports (and thus depressing domestic cotton prices to levels below export parity) were pursued by simply instructing the CEC to refrain from purchasing lint cotton for export until mid-way through the season, when the mills had met their demand. Indeed, in some years the GOP directed the CEC to sell lint directly to the mills, when the market became "over-heated."

In addition to the benchmark system for moderating domestic cotton prices, the GOP sets an "export target" quantity, based on the demand anticipated from the mills. This target acts as an upper limit on exported quantities of raw cotton. If exports appear to be greater than anticipated, given the relationship between the benchmark and spot prices, the GOP can simply suspend all cotton exports by refusing to register export contracts, and by suspending the MEP. The MEP was suspended by the State Bank of Pakistan between February 26, 1989 and October 15 of the same year.

The net result is a variable export levy consisting of the difference between the f.o.b. international price received by the government and the ceiling price it fixes on domestic cotton export prices. This system also has the effect of depressing domestic cotton prices, thereby subsidizing the domestic textiles industry. The sizes of these price margins and export taxes, as well as the level of the export target, are subjects of intense controversy between the various parties to these transactions. These institutions, their roles, and performance are the subject of Chapter Four. The following sections describe in greater detail the operation and effects of the price policy interventions described above, beginning with their broader macroeconomic context.

4.2 Overview of Macroeconomic and Trade Policy Interventions

The foreign exchange rate is the most important macroeconomic policy tool from the perspective of the cotton sector. It influences the relative domestic prices of tradable outputs (such as raw cotton and textiles), as well as the relative domestic prices of tradable inputs

[39] 1 maund = 37.32 kgs. = 82.28 lbs.

and outputs (such as fertilizer and raw cotton). An overvalued exchange rate acts to tax exporters and to subsidize importers. The combination of commodity-specific trade policies and exchange rate policy has had a profound impact on Pakistan's agriculture and economy. This section provides an overview of Pakistan's exchange rate and trade regimes since independence.[40]

Dorosh and Valdes divide the post-independence economic history of Pakistan into five phases: 1) a period of increasing government controls on trade (1952-59), 2) the beginnings of liberalization through multiple exchange rates (1959-72), 3) the post-devaluation period (1972-76), 4) the renewal of balance of trade problems (1978-82), and 5) the managed float of the rupee (1982-present).

The phase of increasing government controls began in 1952, with the post-Korean War slump in the demand for Pakistani cotton and jute exports. The wartime demand sustained Pakistan's foreign exchange earnings, despite the government's decision in 1949 *not* to devalue the rupee, along with other countries in the Sterling Area. The government's response to the decline in export earnings was to increase its control by imposing import restrictions in the form of import licenses. The government also imposed export duties on cotton and jute, and banned the exports of most other agricultural products. Despite the devaluation of the rupee in 1956, poor price incentives contributed to a steep decline in the value of total exports during the 1950s.

The GOP reversed many of these policies in the 1960s. Though the import restrictions remained, the government changed from an anti-export to a pro-export regime. The centerpiece of this reorientation was the "export bonus scheme," implemented in 1959. The export bonus scheme operated by awarding to Pakistani exporters of certain commodities vouchers entitling the owner to purchase foreign exchange for use in importing. The face value of the vouchers was a fixed percentage of the value of the export transaction for which they were awarded. The fact that these vouchers could then be re-sold at prices greater than their face value reflects the tacit understanding that the rupee was overvalued.

The general effect of the scheme was to create an effective devaluation of the exchange rate for exports receiving vouchers and for imports purchased with vouchers.[41] Increasing trust in the market over this period contributed to an easing of import restrictions, though the remaining licensing system created significant rent-seeking opportunities and thus some pressure to maintain the status quo.

Raw cotton was among the few commodities for which exporters did not earn vouchers. In contrast, exporters of cotton yarn and cloth did earn vouchers. This structure

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[40] This section draws heavily on Dorosh and Valdes (1990).

[41] The actual cost of certain imports, for example, would have been the sum of the c.i.f price, the price of the voucher, and whatever import tax pertained.

provided a clear incentive to reduce raw cotton exports in favor of textiles production and exports. The result was a reduction in foreign exchange earnings from raw cotton exports. An early study of the effects of the export bonus scheme calculated a loss of nearly Rs. 100 million in raw cotton export earnings foregone between 1958 and 1961.[42] Yet, for the period 1959 to 1961, the same study estimated that the export bonus scheme contributed Rs. 62.6 million in cotton yarn exports and Rs. 91.4 million in cotton cloth exports. The export bonus scheme remained in effect until the third phase of Pakistan's post-independence economic history began in 1972 with a 131 percent nominal devaluation of the rupee.

The period from 1972 to 1976 also saw other important changes in the trade regime. The salient features of these changes included simplification of the import restrictions and reduction of import duties on capital and intermediate goods. At the same time, however, taxes on consumer goods imports were increased significantly. The pro-export posture of the previous period was reversed, with export duties being imposed on raw cotton, yarn, and cloth, along with other export items.

From 1978 to 1982 the GOP allowed the rupee to appreciate in real terms by maintaining a constant nominal exchange rate in the face of high domestic inflation. Rather than manage the trade balance by devaluation, the government set import quotas and subsidized exports of many commodities.

The rupee had remained tied to the dollar throughout the post-independence period until January 1982. Since that time, the GOP has maintained a partially controlled float of the rupee. A gradual depreciation has accompanied a gradual liberalization of imports.

The macroeconomic and cotton sector interventions described above interacted, taxing or protecting various segments of the cotton sector. The following section summarizes the findings of various studies regarding different measures of taxation and protection of cotton and textiles over time.

4.3 Measures of Cotton Sector Taxation and Protection

This and the following section summarize the results of previous analyses that have attempted to measure the effects of the price and trade policy interventions outlined above. The measures include nominal protection coefficients, effective protection coefficients, producer subsidy equivalents, and consumer subsidy equivalents.

Each of these coefficients measures a different aspect of the policy environment; yet they each convey some notion of the divergence from a free market standard created by policy. Nominal and effective protection coefficients measure the extent to which a commodity is taxed or subsidized in terms of the divergence between its domestic price and

[42] Bruton & Bose (1963), p. 34

its border price. Producer and consumer subsidy equivalents measure the value (or cost) of the full set of direct and indirect interventions to the producer or consumer of that commodity (e.g., they describe the monetary value needed to compensate for the elimination of all interventions).

4.3.1 Nominal Protection Coefficients for Cotton

The degree of taxation or subsidy imposed on cotton producers by these price policies is judged by the margin between the farmgate price and the border price of cotton (e.g., the international price in domestic currency). The simplest indicator of this effect is the nominal protection coefficient (NPC), which is the ratio of the domestic cotton price to the border price. The no tax situation is one in which the border price and the domestic price are equal, implying an NPC of 1. Similarly, an NPC less than one implies taxation of cotton production and an NPC greater than one reflects subsidization.

Several studies have calculated NPC's for cotton in Pakistan. Figure 4.5 combines the results of three studies to show NPC's since 1960/61.[43] Gotsch and Brown's figures are based on farmgate prices for the central Punjab, while Qureshi used an average for Punjab and Sind, and Chaudhry and Kayani do not specify a location.

The division of Figure 4.5 into governmental periods reflects the general relationship between regimes and trade policies. Chapter Five discusses how governments favored different segments of the cotton sector. Figure 4.5 shows that taxation was greatest under Bhutto and lowest under Ayub. Zia still taxed cotton production, but at a lower average rate than Bhutto. These governments and their political economy objectives are discussed below.

The fact that these studies found somewhat divergent results reflects the subtleties involved in making such calculation, the results of which can vary depending on the choice of a border price, exchange rate, or domestic market point at which to make the comparison. Chaudhry and Kayani, for example, used official exchange rates, but chose seed cotton prices for their comparison. This would emphasize the effect on the farmer, whereas using the lint cotton price would emphasize the effect on ginners. Although these studies diverge as to the specific coefficients, they do agree that *there has been a strong tendency to tax cotton producers in recent decades.*

The calculation of NPC's is also quite sensitive to the choice of exchange rate. Gotsch and Brown, and Qureshi re-calculated their NPC's using shadow exchange rates. Although their "equilibrium" NPC's are not identical, both sets of calculations agree that the

[43] Gotsch & Brown (1980), Qureshi (1988), and Chaudhry & Kayani (1991)

rupee was significantly over-valued prior to 1972. This suggests that the degree of taxation was even greater than reflected in Figure 4.5.[44]

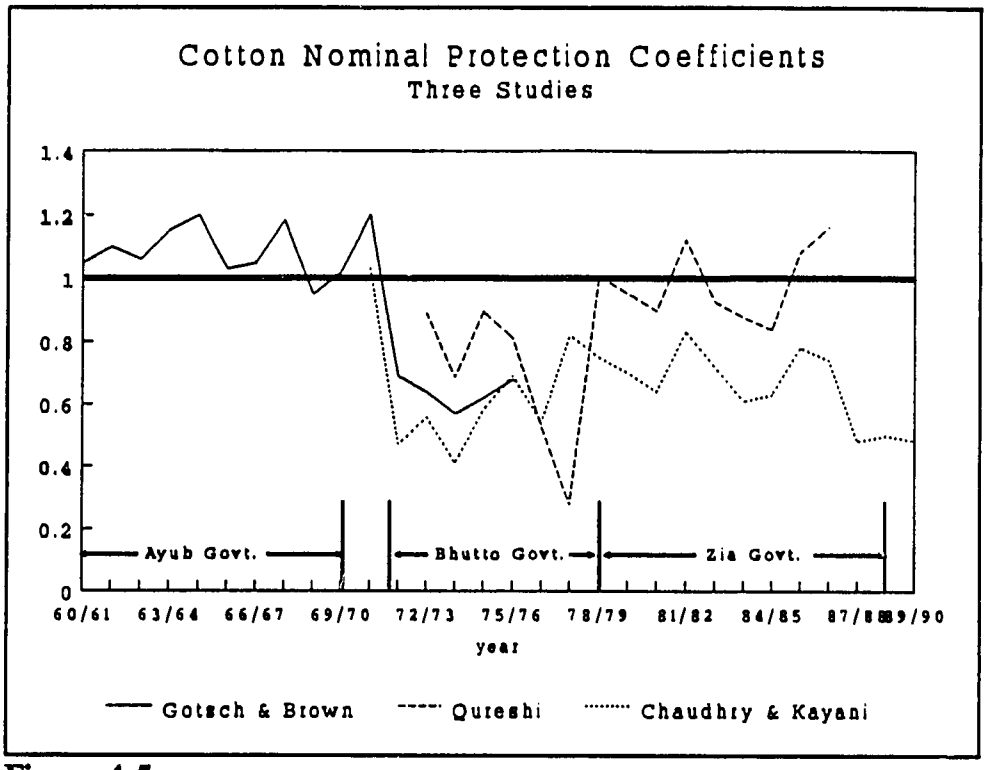

Figure 4.5

Even at official exchange rates, and at all times with shadow rates, cotton was taxed (i.e. the NPC less than one reflects the proportion by which border prices exceeded farmgate prices). Over the entire period shown, the average NPC at shadow exchange rates was 0.63, suggesting an implicit tax rate of 37 percent. This rate fell to 28 percent following the 1972 devaluation of the rupee (i.e. the average NPC from 1972/73 to 1986/87 was 0.72). Yet, prior to the devaluation, the implicit rate of cotton taxation was 49 percent (NPC = 0.51).

In large part, this reflects the export duties on cotton charged from 1959 to 1967. From 1960 to 1964, the rates were Rs. 40 per bale on desi cotton and Rs. 75 per bale on other varieties. In 1964, the rates were lowered to Rs. 10 per bale on all varieties, and the export duty was abolished in 1967. During the 1970s, the CEC ostensibly paid a 10 percent export duty. Section 4.1, above, describes the post 1987 export duty scheme.

[44] Gotsch & Brown contend that using the shadow exchange rate reduces the NPC's by approximately one-half for the period 1960/61 to 1971/72.

One should also note that NPC figures are also quite sensitive to fluctuations in international commodity prices. Indeed, the increased variability of the NPCs in the 1970s is partly a function of much greater variability in world cotton prices (as illustrated below in Figure 8.9).

A somewhat more sophisticated measure of taxes and subsidies would consider not only the output price relative to the border price, but any taxes or subsidies on inputs that influence the net rate of tax or subsidy relative to border prices. While it is true that GOP policies have depressed farmgate cotton prices, they have also tended to subsidize various inputs, principally chemical fertilizers.

4.3.2 Input Subsidies

Recent trends in input pricing have been to reduce or to eliminate subsidies; yet input subsidies played an important role in earlier years. At various times, Pakistani farmers have benefitted from direct subsidies on fertilizer, tubewells, plant protection, seeds, electricity, water, and credit.

Fertilizer subsidies in the late 1950s and early 1960s were 60 percent of the fertilizer price. Subsidies applied to both domestically-produced fertilizer (primarily urea-based) and on imported fertilizers (primarily phosphate-based), for which the government was the sole legal importer until 1986. The government covered the domestic marketing costs for all imported fertilizers. In addition, a "development surcharge" was imposed as a means of having low-cost domestic fertilizer producers cross-subsidize high cost domestic producers.

Beginning in 1980 the government began to phase out fertilizer subsidies. Accordingly, between 1980 and 1987, phosphate and potash fertilizers doubled in price. Moreover, the GOP has permitted private fertilizer imports since 1987 (though domestic subsidies on phosphatic fertilizers continue to undermine the profitability of private imports).

While fertilizers dominated the agricultural subsidy bill, the benefits from pesticide subsidies have also been significant. Cotton, in particular, is a heavy consumer of pesticides. Pesticide subsidies were eliminated with the privatization of pesticide trade in 1980. From 1972/73 to 1980/81, however, the cost of pesticide subsidies had averaged Rs. 225 million per year.[45] Provincial governments still provide small subsidies for the purchase of sprayers, and the central government will cover the cost of a plane and pilot for aerial spraying if the farmer pays for the pesticide. Ender reports, however, that there has been little aerial spraying of cotton.[46]

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[45] Qureshi (1988), p. 92

[46] Ender (1990), p. 25

Qureshi calculates that total subsidies to agriculture in 1986/87 equaled Rs. 5.29 billion.[47] The net effect of depressed output and tradable input prices is captured by the effective protection coefficient (EPC). The general formula for the EPC is given by:

$$EPC_i = \frac{Q_i\left(p_i^d - \sum_{j=1}^{k} a_{ij} * p_j^d\right)}{Q_i\left(p_i^b - \sum_{j=1}^{k} a_{ij} * p_j^b\right)}$$

where Q is the quantity of cotton produced, a_{ij} is the quantity of the jth input used to produce one unit of cotton, and the p's are prices where the superscript b or d refers to border or domestic price and the subscript i refers to cotton and j refers to the inputs, j = 1...k.

4.3.3 Effective Protection Coefficients for Cotton

As input use patterns vary among "types" of farmers, EPC's are often calculated for several representative types, such as traditional, progressive, and mechanized farmers. Yet, due to the fairly small proportion of purchased (tradable) inputs in Pakistan's agriculture, and the fact that the NPC's for the most important tradable inputs were approximately equal to the NPC's for cotton, the differences between the NPC's and the EPC's are quite small. Table 4.2 exemplifies these differences for selected years.

Table 4.2 Protection Coefficients for Cotton

Traditional Farmers	65/66	75/76	83/84
EPC	.49	.68	.59
NPC	.49	.68	.63
Progressive Farmers			
EPC	.50	.67	.59
NPC	.49	.68	.63
Mechanized Farmers			
EPC	.50	.68	.63
NPC	.49	.68	.63

(Figures are calculated at shadow exchange rates.)
Sources: 65/66 - 75/76, Gotsch & Brown; 83/84, Qureshi

[47] Qureshi (1988), p. 96

4.3.4 Producer Subsidy Equivalents for Cotton[48]

The producer subsidy equivalent (PSE) summarizes the net effects of all taxes and subsidies on producers of a given commodity. PSE's describe the overall value to a producer of the entire set of government interventions. Thus, the PSE attempts to measure the amount of money that would be necessary to compensate a producer for the removal of all policy interventions. More specifically, the PSE incorporates estimates of both the (direct and indirect) transfers to producers from government expenditures and the transfers which result from the effects of policy interventions (e.g. the difference between actual domestic prices and what they would have been in the absence of the policy). The PSE methodology has the further advantage of permitting the identification of the individual effects of various interventions.

In essence, a PSE percentage is the ratio of total transfers to producers to the value of the crop to the producer. The total transfer due to government is the sum of the direct transfers, indirect transfers (i.e. distortions from exchange rates, input subsidies), and the difference in consumer payments to producers resulting from the policy. The total value of the crop to the producers is defined here as the sum of payments by the market plus direct government payments to producers. That is,

$$\textit{Percentage PSE} = \frac{\textit{Total Transfers}}{\textit{Producers' Value}} = \frac{Q*(P_d - [P_w * X]) + D + I}{Q*P_d + D}$$

where,

Q = quantity of cotton produced

P_d = producer price in rupees

P_w = world cotton price in dollars

X = exchange rate (Rs./$)

D = direct government payments, and

I = indirect transfers via policies.

Ender calculates PSE's for cotton from 1981/82 to 1986/87, though he does not include the effects of overvaluation of the exchange.[49] Table 4.3 summarizes Ender's results.

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[48] This section draws heavily on Ender (1990), to which the reader is referred for greater detail in the calculations underlying the PSE's summarized here.

[49] Ender (1990), p. 25 ff

Table 4.3 Pakistan Cotton Producer Subsidy Equivalents

Item	Unit	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
A. Production	1,000 tons	2,244	2,472	1,484	3,026	3,651	3,959
B. Producer Price	Rs./40 kgs.	187	190	296	204	201	213
	Rs./ton	4,678	4,758	7,401	5,099	5,028	5,313
C. Producer value	Mil. Rs.	10,498	11,762	10,982	15,431	18,359	21,036
D. Policy Transfers to producers:							
1. Output price interventions --							
a. Support prices & state trading	Mil. Rs.	(1,085)	(3,668)	(1,662)	(4,795)	664	(6,736)
b. % of producer value	Percent	(10)	(31)	(15)	(31)	4	(32)
2. Assistance on inputs --							
a. Fertilizer	Mil. Rs.	311	207	63	315	329	87
b. Credit	Mil. Rs.	46	58	87	108	134	187
c. Electricity	Mil. Rs.	127	137	141	150	181	219
d. Irrigation	Mil. Rs.	81	80	105	197	190	232
e. Total	Mil. Rs.	566	482	396	770	835	725
f. Percent of producer value		5	4	4	5	5	3
3. Total policy transfers to producers --							
a. Total	Mil. Rs.	(520)	(3,186)	(1,266)	(4,025)	1,499	(6,011)
b. Percent of producer value	Percent	(5)	(27)	(12)	(26)	8	(29)
c. Per ton	Rs./ton	(232)	(1,289)	(853)	(1,330)	411	(1,518)

Source: Ender (1990), p. 37

The PSE's for cotton suggest net implicit *taxes* in five of the six years calculated (e.g. negative subsidy equivalents). The rate of taxation varied widely, ranging from 29 percent in 1986/87 to 5 percent in 1981/82. The sole year in which subsidies were positive was 1985/86, when the PSE was 8 percent. The implicit tax resulting from support prices and state trading alone ranged from 10 percent in 1981/82 to 32 percent in 1986/87, with the sole positive effect of 4 percent coming in 1985/86. These taxes were mitigated by input subsidies, which ranged from 3 to 5 percent. Figure 4.6 summarizes these levels of net implicit taxation (PSE percentages).

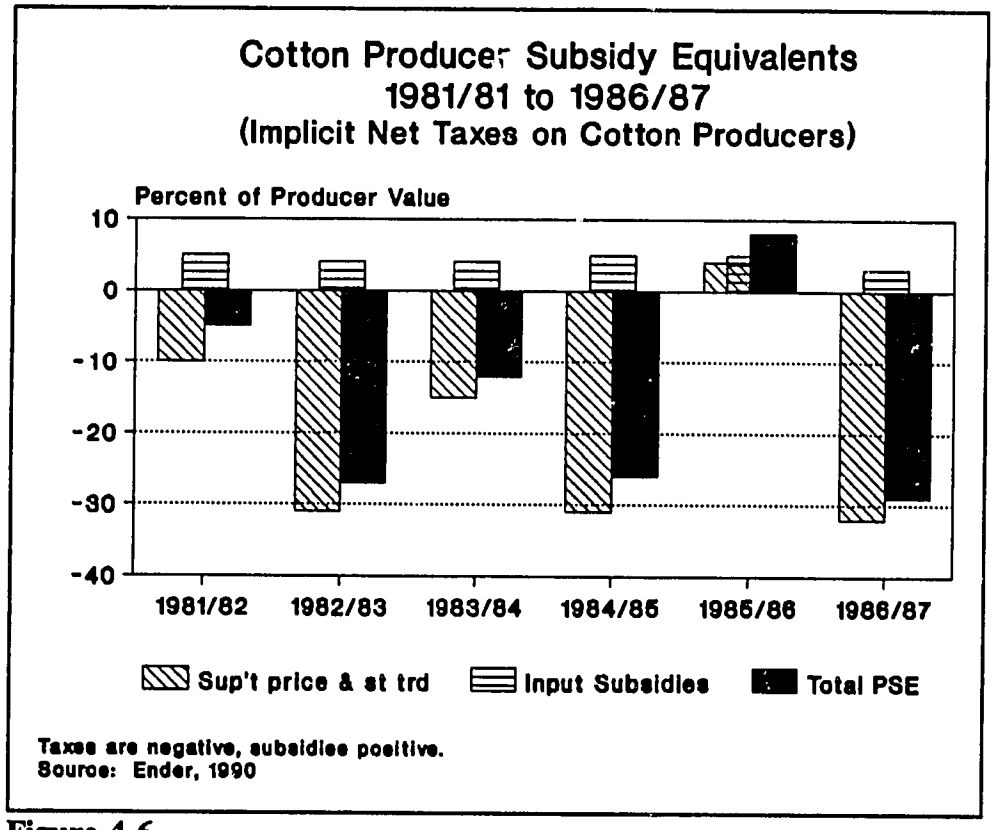

Figure 4.6

The high PSE calculated for 1982/83, in part, reflects the effects of the devaluation of the rupee following its de-coupling from the dollar in 1982. The drop in the PSE in 1983/84 resulted from the increase in domestic cotton prices that year due to a production shortfall. In 1984/85, further depreciation of the rupee increased the apparent tax. Yet, the following year saw world cotton prices fall so low that Pakistan traded some cotton at a loss, pushing the PSE to reflect a positive subsidy. In 1986/87, further devaluation of the rupee and increased domestic and world cotton prices pushed the taxation resulting from support prices and state export restrictions to its highest level. These effects were mitigated by the input subsidies present each year.

The average tax from support prices and state trading interventions was 19.2 percent of producer value; the average input subsidy was 4.3 percent of producer value. Thus, the PSE's suggest an average net implicit tax on cotton producers over the period 1981/82 to 1986/87 of 15 percent.

4.4 Price Policy Interventions in the Cotton Textile Sector

Development of the domestic textile industry was a high priority in the early years of Pakistan's independence. Successive governments thus adopted trade regimes which provided heavy protection to the nascent industry. These interventions generally combined measures to depress raw cotton prices and to tax textile imports. The previous sections described in some detail those measures -- primarily export taxes -- intended to depress raw cotton prices. The overvalued exchange rate prevalent through most of Pakistan's post-independence history reinforced the direct cotton price policy interventions by reducing the profitability of cotton exports.[50]

Dorosh and Valdes have calculated that in 1963/64, effective rates of protection on cotton yarn and cotton fabrics were 82 and 213 percent, respectively.[51] In 1968/69, the effective rate of protection for both yarn and fabrics was 173 percent. Dorosh and Valdes further report that, despite the fact that exports of both cotton yarn and raw cotton were taxed from 1972/73 to 1976/77, yarn production was effectively protected as a result of the relatively higher export tax on raw cotton.

The policy environment for yarn exporters was quite volatile during the 1970s. Frequent policy changes created great uncertainty for those invested in textiles. For example, Table 4.4 shows the frequency and magnitude of changes in yarn export duties during the past two decades.

The burden of this uncertainty for yarn exporters was increased by the government's insistence that each new rate be applied to standing export contracts. Indeed, in 1972, this policy caused Japan, Pakistan's major yarn buyer, to withdraw from further purchases of Pakistani yarn.

The protection of domestic spinning operations was further strengthened in 1977/78 by compensatory rebates of 7.5 percent of the f.o.b. price. The combination of subsidies promoted the spinning industry's rapid growth, despite low yarn export prices and out-dated machinery, which resulted in negative value added at world prices during 1980/81.[52]

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[50] Dorosh & Valdes (1990) suggest that the rupee has been overvalued by approximately 20 percent throughout the 1980s.

[51] Ibid., p. 27

[52] Ibid., p. 27

Table 4.4 Export Duties on Cotton Yarn
(21 and 24 counts, per pound)

June 26, 1971	20 paisas
May 11, 1972	70 paisas
November 24, 1972	9 paisas
April 1, 1973	20 % avg. plus 20 paisas
June 10, 1973	25 % avg. plus 20 paisas
July 11, 1973	30 % avg. plus 65 paisas
October 26, 1973	40 % plus 40 paisas
March 1, 1974	35 % plus 40 paisas
June 1, 1974	20 % plus 40 paisas
August, 1974	**DUTY ABOLISHED**
June 12, 1987	Rs. 5/kg
September 22, 1987	Rs. 10/kg
January 1, 1988	17.5% ad valorem (max Rs. 10/kg)
May 11, 1988	Rs. 2/kg
May 23, 1989	Rs. 3/kg
June 25, 1990	some grades exempted
May 29, 1991	Rs. 6/kg

Source: Adams & Iqbal, (1983), p. 189, and APTMA (interview, 6/30/91)

The 1980s saw a rapid increase in world yarn prices. In response, the GOP withdrew yarn export subsidies, and imposed a moderate tax on yarn exports. The initial rate of this tax was Rs. 2 per kg. of yarn, though the current rate is Rs. 6 per kg. This tax, in turn, benefits the domestic weaving industry. In 1980/81, cotton fabrics' effective rate of protection was 157 percent.

The garment industry also benefitted from a positive, though lower, rate of effective protection. In 1980/81, the EPC for garments was 33 percent. As in the case of producer subsidy equivalents for cotton production, a summary measure of the net taxes and subsidies on cotton consumption by textile manufacturers is also available through the consumer subsidy equivalent.

As one might expect, the effect of GOP policies on cotton yarn and cloth manufacturers has been the opposite of their effect on producers. CSE calculations for cotton reveal significant subsidies in nearly every year for which we have calculations.[53] Table 4.5 presents Ender's calculations of CSE's for the period 1981/82 to 1986/87, which are summarized in Figure 4.7.

[53] The CSE calculations are from Ender (1990).

Table 4.5 Consumer Subsidy Equivalents for Cotton

Item	Unit	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
A. Consumption	'000 bales	2,238	2,450	2,030	2,264	2,520	2,990
	'000 tons	487	533	442	493	549	651
B. Consumer price	Rs./ton	11,953	12,677	18,898	14,595	12,359	13,324
C. Consumer cost	Mil.Rs	5,823	6,761	8,351	7,193	6,780	8,672
D. Policy transfers to consumers							
- State trading	Mil.Rs	2,616	5,494	4,428	4,602	1,483	6,704
E. Total policy transfer to consumers							
a. Total	Mil.Rs	1,274	2,928	1,957	2,269	814	4,364
b. Percent of consumer cost	Pct.	22	43	23	32	12	50
c. Per ton	Rs./ton	2,616	5,494	4,428	4,602	1,483	6,704

Source: Ender (1990), p. 41
Note: "Consumers" refers to the textile industry

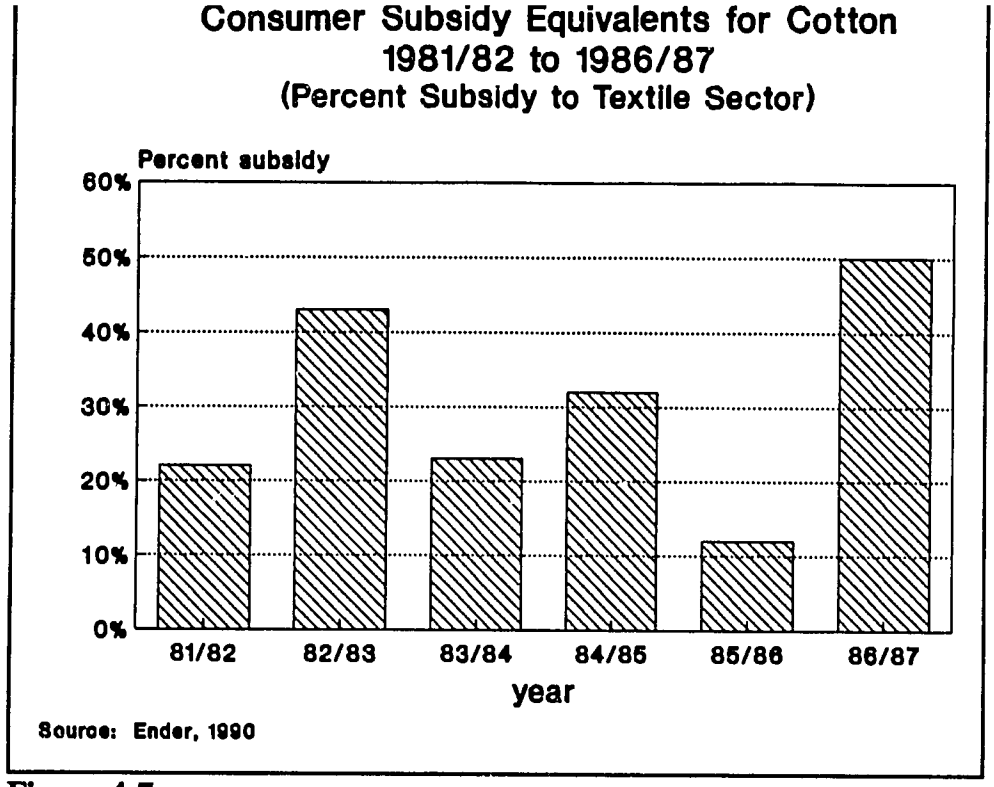

Figure 4.7

Ender shows that the total policy transfer to consumers averaged Rs. 2,268 million from 1981/82 to 1986/87 (Rs. 2,558 million, excluding 1885/86). The range was from Rs. 814 million in 1985/86 to Rs. 4,364 million the following year. As a percentage of consumer cost, these CSE's ranged from 12 percent in 1985/86 to 50 percent the following year. The average subsidy was 30 percent over this period (34 percent excluding 1985/86). The low CSE for 1985/86 reflects a drop in world prices, reducing the effective subsidy to textile producers that year.

4.5 Summary: Net Effects of Cotton Price Policy Interventions

Clearly, cotton yarn and cloth producers were the primary beneficiaries of the GOP's policy interventions, while cotton producers were the primary losers. Textile manufacturers were consistently able to purchase their primary input for 25 percent to 50 percent less than the relevant border price, while producers consistently received 15 to 30 percent less than the export value of their product. In years when the absolute value of the (negative) PSE exceeded the absolute value of the (positive) CSE, the difference was paid by taxpayers. Table 4.6 summarizes the net effects of the CSE's and PSE's and calculates the effect on taxpayers.

Table 4.6 -- Net Effects of PSE's and CSE's, 1981/82 to 1986/87

Item	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
				Million rupees		
Price wedge:						
PSE	-1,085	-3,668	-1,662	-4,795	664	-6,736
CSE	-1,274	2,928	1,957	2,269	814	4,364
To Govt.	-189	740	-295	2,526	-1,478	2,372
Input Subsidies:						
PSE	566	482	396	770	835	725
CSE	0	0	0	0	0	0
To Govt.	-566	-482	-396	-770	-835	-725
Total Effect:						
PSE	-520	-3,186	-1,266	-4,025	1,499	-6,011
CSE	1,274	2,928	1,957	2,269	814	4,364
To Govt.	-755	258	-691	1,756	-2,313	1,647

Source: Ender (1990), p. 42

Taxpayers joined producers in subsidizing textile manufacturers in three of the six years shown; taxpayers shared in the resources extracted from cotton producers in the other three years. On average, however, taxpayers paid Rs. 16 million per year to support the GOP's cotton price policy interventions. In addition, it should be noted that the PSE's and CSE's presented above do not include consideration of exchange rate overvaluation and (in the case of the PSE's) investment in irrigation (though the irrigation subsidy is included). The irrigation investment subsidy would add 3 to 5 percent to the input subsidies, while the effect of the exchange rate overvaluation would be to exacerbate the tax on producers and the subsidy on textile manufacturers.

The Asian Development Bank (ADB) has recently made its own assessment of the net cost of Pakistan's textile policy.[54] That review suggests that Pakistan paid a high price for the promotion of its spinning industry. Among the costs, the ADB includes: income foregone by cotton producers, lower cotton production (a supply response to the depressed price), and forgone export revenues and trading profits for the GOP. In addition, the ADB argues that lost cotton production hurt the country's balance of payments position, and cost jobs (since massive investment went to a relatively labor-intensive activity -- spinning).

[54] Asian Development Bank (1991), pp. 162-163

In return for these costs, the ADB finds few benefits. In particular, the ADB reports findings that the value added by spinning was negative in the early 1980s and only slightly positive after 1986.

This and the preceding chapter have described in detail the range of GOP cotton sector price and trade policies, as well as their measured effects and the institutional context from which they have emerged. The following chapter concludes Part I of this study, generalizing the preceding analyses by placing them in the broader context of Pakistani politics and examining the political economy of cotton policy in Pakistan.

5. POLITICAL ECONOMY PERSPECTIVES ON COTTON IN PAKISTAN

The preceding chapters have reviewed the GOP's cotton sector price and trade policies, and interpreted them from both an economic and an institutional perspective. This chapter broadens the analysis still further by considering the political context in which those policies were formed and in which the relevant institutions interacted.

5.1 Overview of Pakistani Politics Since Independence[55]

Politics during the early years of Pakistan's independence were dominated by Mohammed Ali Jinnah, whose Muslim League led the fight for a separate Muslim state. Jinnah, who died in 1948, and his successor, Liaqat Ali Khan, built a political coalition that rested heavily on the support of urban professionals and businessmen. Large numbers of them had recently migrated to Pakistan from what had been British India. The traditional landed aristocracy of the four Indian provinces which became Pakistan were not strong supporters of Jinnah and were largely excluded from his political coalition.

Accordingly, Jinnah introduced a relatively laissez-faire economic orientation, with industrial development as its highest priority. In this environment, the refugee-merchants and industrialists who provided the backbone of Jinnah's support prospered. In addition to their political influence, these migrant-industrialists benefitted from commercially-oriented institutions, such as the Muslim Federation of Chambers of Commerce, which promoted horizontal integration of commercial houses. Thus, the economic power and influence of Pakistan's leading commercial families was established early in the post-independence period.

By 1951, with the assassination of Liaqat, the Muslim League's power was severely diminished, in part due to the re-entry into politics of the old landed classes of the Punjab. The landlord-dominated Republican Party engaged the Muslim League in continual political battles, which had the effect of both weakening the government's legislative institutions and creating a political vacuum in which the Civil Service of Pakistan (CSP) came to dominate the executive branch.

The CSP was the Muslim branch of the Indian Civil Service, inherited by the new state at Independence. The CSP was drawn from both landed and professional families, and had close ties to the only other well-organized political force in Pakistan at that time -- the army. Together, these two institutions exerted a strong influence on Pakistan's political development in the first two decades of independence.

[55] This section draws heavily on Burki (1980).

Increasing bureaucratic control of government characterized Pakistani politics after 1953. A defining feature of the period from 1953 to 1962 was the political displacement of the refugee urban merchants by the traditional landed classes indigenous to Pakistan.[56] The rise of the CSP represented a return to colonial governmental style, with which the traditional landed classes were comfortable. The bureaucracy established a high level of control over economic activities and policies, including control of the foreign exchange rate and the allocation of scarce foreign currency. This led to the establishment of a list of permissible imports. This list and the allocation of foreign exchange tended to serve the interests of the large landlords. For instance, the government used this list to promote the mechanization of agriculture, which helped the large landowners to expand their holdings. By 1961, 5 percent of rural households owned 70 percent of the agricultural land.[57]

Another characteristic of this period was the weakening of fledgling democratic institutions and modern political parties. The bureaucratic domination of government was conducive to military control.

5.1.1 The Ayub Government, 1958-1969

General Mohammad Ayub Khan took power in a military coup in 1958. Ayub's power base, in addition to the military, was a combination of those which had preceded him: the CSP continued to play a strong role in managing the government and economy, yet Ayub was most closely allied with the merchant-industrial families. Thus, political favor shifted back away from the landed aristocracy under Ayub.

Rapid economic growth was the primary objective of Ayub's economic policy. Under this regime, industrialists were the primary winners, and industrial laborers, the primary losers. The Government promoted capital-intensive development by maintaining an overvalued exchange rate, which subsidized the importation of machinery by industrialists and large farmers. This exchange rate policy favored the industrial sector and penalized agriculture by acting to make capital imports artificially cheap while making agricultural exports artificially dear (and hence less competitive in international markets). This policy also contributed to high urban migration and increased urban unemployment. Ayub simultaneously discouraged unionization in the industrial sector. Moreover, Ayub's drive for rapid growth and industrialization led to a neglect of social sectors, such as health and education.

The result of a decade of these policies was the tremendous and highly visible concentration of wealth among the large industrial families, and the political alienation of the urban middle class and labor. In West Pakistan in 1968, the 43 top industrial families

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[56] Burki refers to this as the period of "indigenisation" of Pakistani politics. Burki (1980), p. 24

[57] Adams & Iqbal (1983), p. 73

controlled 48 percent of total manufacturing assets and 54.4 percent of all privately controlled firms. The largest four of these families alone controlled 13.3 percent of all manufacturing assets and 16.4 percent of privately controlled firms.

Across industries, the greatest concentration of holdings by the top 43 families was in cotton textiles. The top 43 families owned 27 percent of the cotton textiles industry in 1968.[58] In addition, from 1960 to 1965, the top seven families received 20 percent of the Government's foreign exchange allocations.[59]

This highly visible accumulation of wealth contributed to growing political agitation during Ayub's last year in power. Beginning in the summer of 1967, excluded groups, led by the middle classes but including urban laborers and professionals, engaged in political violence. Ayub was forced from office in March 1969, and was replaced by Yahya Khan, the commander-in-chief of the armed forces. Yahya Khan's rule lasted only two years, and can be regarded as a transition to the important changes which followed the election of 1970.

The direct events leading to the election of 1970 were set in motion by Ayub in 1967, when he dismissed a dynamic, young cabinet minister named Zulfikar Ali Bhutto.

Bhutto took advantage of the growing political chaos in the country to build his own coalition of various left-leaning and socialist leaders. Bhutto succeeded in organizing a new political party, the Pakistan People's Party (PPP), and in 1970 became Pakistan's first popularly elected leader.

5.1.2 The Zulfikar Ali Bhutto Government, 1971-1977

Bhutto's accession to power was postponed by the Bangladeshi war of independence in 1971. The army's humiliating failure to maintain national unity led directly to Yahya's fall from grace. The civilian government was installed in December 1971 and was to remain in power until 1977.

Bhutto had promised to redress the economic imbalances of the Ayub period by implementing large-scale land reforms and widespread nationalization of important industries. These promises had won him the support of a broad coalition of interests, including industrial labor, the urban middle class, rural landless and small farmers, and small-scale businessmen. These groups represented a political alliance united primarily by its opposition to the concentration of wealth among the large-scale industrialists. They each expected to benefit from the change in political regimes.

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[58] Industry concentration figures are from White (1974).

[59] Adams & Iqbal (1983), p. 80

During the first two years of Bhutto's rule, leftist politicians dominated the PPP. Carried by their influence, the Government immediately introduced policies aimed at reversing the political and economic power of the dominant elites under Ayub. The three-pronged attack consisted of the dissolution of the CSP, reform of the military, and a broad program of nationalization of major industries.

Dissolution of the CSP and reform of the military were moves intended to clear the way for the PPP's program of economic and social reforms. The program of nationalization was directed against the large-scale industrialists, who though closely tied to the Ayub Government, were unrepresented under Bhutto. Thus, Bhutto was faced with the dilemma of how to reduce the influence of these groups without rendering them incapable of contributing to the functioning government and the economy. As Adams and Iqbal point out, Bhutto was also faced with the challenge of how to provide economic benefits to his diverse groups of constituents, given limited financial resources.[60]

Under the guidance of socialist Finance Minister Mubashir Hasan, nationalization of the basic industries proceeded rapidly. Nationalization of cotton exports and establishment of the CEC in 1973 can be seen as part of this move against the large industrial families.[61]

These moves contributed to widespread uncertainty within the business community, which responded by refraining from investing further in manufacturing capacity. The reaction of the industrialists was characterized by Ahmed Dawood, from the country's second richest family, who warned, "If you kill a cow, you have meat for one day only. But if you keep the cow, you have milk every day. Pakistan needs milk now."[62]

Instead, the Government proceeded with its program of nationalization, and further weakened the large industrialists by promoting labor reform in large-scale industries. This served both to harm the industrialists and to shore up the PPP's support among urban laborers, who had played a large role in removing Ayub from office. For the first time, labor became an important force in Pakistan's national politics.

In general, the reforms of Bhutto's first two years in power reflected the urban bias of the PPP's left wing. Most of the reforms were concentrated in urban areas, with little progress being felt in the rural economy. In addition, the relatively poor economic performance which accompanied many reforms (though international market conditions and poor harvests contributed to the economic performance) undermined the Government's ability to reward its political supporters. Increasing political pressures contributed to tensions within

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[60] Adams & Iqbal (1983), p. 82

[61] As argued in Chapter Three, establishment of the CEC was also justified as an attempt to restore confidence in Pakistan's cotton exports. It's difficult to say which motivation carried greater weight.

[62] Quoted in Burki (1980), p. 115

the PPP. The result, in 1974, was the expulsion of the party's left wing, and a re-entry of landed interests into national politics, via the PPP.

The reward to the large landlords was a significant role in the management of the 4000 agro-industrial enterprises nationalized by Bhutto in 1976. These enterprises were principally wheat and rice mills, and cotton gins. Thus, the landed aristocracy gained significant control over the marketing and distribution of these commodities. The nationalization of cotton ginning fared quite poorly, and lasted only one year. This move did succeed, however, in alienating the rural middle class of grain traders and agro-industrialists from Bhutto and the PPP. Adams and Iqbal suggest that nationalizing the agro-industries was Bhutto's principal miscalculation.[63] The Government was incapable of managing these industries, and the breakdown of the grain trade contributed to the alienation of farmers and consumers.

Bhutto won the election of 1977 despite growing social unrest and political agitation. Widespread allegations of vote fraud ignited intense political agitation, resulting in the re-entry of the army as a dominant force in Pakistani politics. In July 1977 Army Chief, General Muhammed Zia ul-Haq, removed Bhutto from power and established a military government. Though out of office, Bhutto remained a force in Pakistani politics for another twenty-one months. Fearing his remaining popularity, the Zia Government hanged Bhutto in April 1979.

5.1.3 The Zia Government, 1977-1988[64]

Bhutto had chosen Zia to head the army, thinking that a devout Muslim with Zia's background would pose little political threat. Ultimately, these qualities appealed to a middle class that perceived Bhutto as an enemy of both the middle class and Islam.

Zia took power with no particular political program, promising to hold elections in ninety days. It took eight and a half years for Zia to keep his promise, during which time he ruled largely by presidential decree. Burki explains Zia's political longevity as the result of five factors:

1) safeguarding middle class social values;
2) successful economic development;
3) skillful handling of the armed forces;
4) the Soviet invasion of Afghanistan; and
5) luck.[65]

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[63] Adams & Iqbal (1983), p. 86

[64] This section relies on Burki and Baxter (1991).

[65] Burki (1991), chapter 1.

Zia recognized the depth of middle-class anger at Bhutto, and responded by making Islamization one of his main objectives. This move served both to assuage the feelings the middle class and to neutralize the Islamic fundamentalist movement in Pakistan. Indeed, the silent support of the middle and lower-middle classes later helped to buoy Zia's government, when attempts were made to stir unrest.

Zia had little interest in economic management, leaving most of the specifics to trusted technocrats. This group included both civil servants and industrialists. Of the leader of this group, Zia once stated, "I really don't care what he does as long as the economy continues to function smoothly and the poor and the lower middle classes continue to see some hope for themselves."[66]

Given this broad mandate, Zia's economic managers performed well. Rather than race to undo Bhutto's reforms, this group moved slowly. Their priority was to reduce the level of government spending. Zia's government also made it a priority to mend relations with the international donor community, which had distanced itself from Bhutto's socialist reform program.

Between 1977/78 and 1985/86, Pakistan's GNP grew by 76 percent and per capita income grew by 34 percent. During that period, the country also received $25 billion in remittances from Pakistani workers in the Middle East. Thus, the country's economic fortunes during Zia's rule contributed to general political calm.

As Burki notes, however, middle-class support and economic success alone would not have kept Zia in power without the loyalty of senior army officials. Learning a lesson from his military predecessors in the Presidency, Zia was careful not to delegate too much authority to his generals. Zia also adopted a policy of job rotation in the top military posts, ensuring that no individual other than himself would gather too much power.

The Soviet invasion of Afghanistan in December 1979 provided Zia the opportunity to leverage large amounts of western aid by opposing the Soviet Union. Zia also served as a major conduit of Western arms to the Afghan rebels. The success of this policy, marked by the Soviet commitment in 1988 to withdraw from Afghanistan, strengthened Zia, both at home and abroad.

Burki also argues that Zia was consistently lucky. Among these instances, Burki includes: Zia's unlikely selection as army chief by Bhutto, Bhutto's rapid political demise, several instances of poor luck by Zia's political opposition, the economic boom in the Middle East, and the political opportunities which accompanied the Soviet invasion of Afghanistan.

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[66] Quoted in Bùrki (1991), p. 13

Zia was killed in a plane crash in August 1988, after eleven years of autocratic rule. U.S. and Pakistani investigators concluded that the crash was a result of deliberate sabotage; yet, no one has ever claimed credit for Zia's assassination. The reasons for his death remain a mystery.

5.1.4 The Benazir Bhutto Government, 1988-1990

Following Zia's death, open elections were held in Pakistan for only the second time in the country's history. For the second time, the Pakistan People's Party (PPP) won. This time, the PPP was led by its founder's daughter, Benazir Bhutto. The free election of a young, Western-educated, woman was remarkable in a country that had recently moved towards Islamic fundamentalism. To smooth the transition back to democracy, as well as to minimize opposition to her new government, Benazir Bhutto consciously tried to avoid conflict with either the military or the civil service. Like Zia before her, Benazir Bhutto gave the civil service a broad mandate over economic policy making. She retained Zia's finance advisor, and created an Economic Policy Committee, chaired by a Karachi businessman.

In actuality, the PPP gained only enough parliamentary seats to lead a coalition of parties. Despite the early euphoria surrounding Benazir Bhutto's election, her parliamentary coalition soon proved fragile.

Burki describes that the PPP spent most of its first year in power trying to oust the Punjab's chief minister, Mian Nawaz Sharif. Sharif, who was to succeed Benazir Bhutto in 1990, was an industrialist who Zia had groomed for political leadership. Under Sharif's influence, the Punjab government continually challenged the PPP's initiatives.

At the same time, ethnic rivalries turned Sind province into a battleground, requiring the army's intervention in Hyderbad. This unrest took a heavy toll on both the Sind and the national economies, costing the PPP government valuable urban support in Bhutto's home province.

Political opposition mounted, and the PPP's coalition government grew increasingly vulnerable. Charges of corruption levied by the opposition further paralyzed the Government. In August 1990, Pakistan's President, relying on constitutional authority created by Zia, dismissed Benazir Bhutto's government. Hurt by political and ethnic unrest, as well as charges of corruption, the PPP fared poorly in the elections of October 1990. These elections marked at turn back towards "Ziaism," with the election of Zia's former Punjab chief, Mian Nawaz Sharif.

5.2 The Political Economy of Exports and Cotton Sector Policy[67]

The export regimes and cotton sector policies adopted by Pakistan's governments have clearly reflected the interests of the supporters of the government in power. The previous section traced the rise of the large industrial families under Jinnah and his successors through Ayub in the 1960s. In the 1970s, Bhutto sought to undermine their influence, along with that of the army and civil service, and promoted the interests of urban professionals, labor, and traditional landed elites. The industrialists' influence rose again under Zia and the military. Benazir Bhutto did not return to her father's socialist direction. Instead, she adopted a favorable attitude toward the industrial and business community, similar to that of Zia.[68] This section places Pakistan's trade regimes and cotton sector policies in the context of the political tug-of-war described in the previous section.

The Ayub Government's strong orientation toward economic growth and export promotion was expressed through a series of policies which taxed agriculture and benefitted the large-scale industrialists. Cotton textiles were at the heart of Ayub's push for rapid industrialization. Thus, the textile industry benefitted from an overvalued foreign exchange rate, as well as export bonus vouchers, tax and export rebates, and other incentives. At the same time, Ayub acted to depress agricultural prices, including that of cotton, which further subsidized the textile industry.[69] In sum, Adams and Iqbal describe the concentration of wealth among the cotton industrialists as "... the most visible product of the emphasis of the Ayub government on private enterprise."[70]

As noted above, this concentration of wealth had been a clear unifying symbol for the coalition that backed the rise of Z. A. Bhutto. Thus, once in power the Bhutto government acted quickly to attack the economic power and influence of the cotton industrialists. The PPP under Bhutto adopted a wide range of policies to further that end. Moreover, threats to nationalize the textile industry, though never carried out, contributed to the disincentives to re-invest in an industry already suffering from a depleted capital stock.

The policy siege against the large-scale textile manufacturers came from three directions: trade policy, labor policy, and policies to promote structural change within the industry.

Chapter Seven, below, describes the rise of the power loom sector in the 1960s and 1970s, as well as the steady decline in the installed and working capacity of the mill sector

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[67] This section draws heavily from Adams & Iqbal (1983).

[68] Figure 4.5 relates these political changes to trends in nominal protection coefficients for cotton.

[69] Export duties on raw cotton imposed by Ayub were described in Chapter Four, above.

[70] Adams & Iqbal (1983), p. 177

after 1972/73. Bhutto's initiatives clearly promoted this displacement of the formal mill sector by the power looms. The most significant of these policies was Bhutto's exemption of power loom firms (defined as units of four or less power looms) from excise taxes. The excise tax was progressive with respect to firm size: firms with five to eight looms paid Rs. 75 per loom per year, firms with nine to twelve looms paid Rs. 800 per loom per year, and firms with greater than twelve looms paid on an ad valorem basis (with different rates by quality).

While it is likely that some of the apparent displacement of formal mills by power looms simply reflected the partitioning of factories into small units as a means of tax avoidance, the tax exemption does seem to have promoted a true structural transformation in the textile industry.[71] Yet, despite this beneficial impact on small-scale manufacturers, the PPP did little more to assist them. There was no coherent national strategy to support this sector, which could have provided important political support to the PPP. Instead, the power loom sector (which concentrated on weaving) was allowed to suffer along with the mill sector weaving operations from increasing yarn prices.

It is difficult to provide an exact assessment of the employment implications of this structural transformation, since the exact number of power looms is unknown, and employment in them may fluctuate seasonally in rural areas. It is clear, however, that the power loom sector has become a major source of small-town employment. One estimate suggests that by the late 1970s, the power loom sector generated employment for 235,000 families.[72] Yet, it is important to note that small-scale employers, such as power loom operators, were also exempt from many of the labor regulations imposed by the PPP.

As noted above, urban labor played an important role in Bhutto's election. By promoting various types of labor policy reform, Bhutto was able simultaneously to reward their political allegiance and to further cripple the large textile industrialists. The PPP began in 1972 by increasing minimum wages by 22 percent and fringe benefits by 35 percent. These reforms reinforced the upward pressure on wages resulting from the mass migration of labor to the Middle East during the same period. Other reforms to increase job security may have contributed to worker absenteeism. The result was a dramatic increase in the cost of production in large-scale manufacturing. Moreover, in lamenting the effects of the labor reforms, one Pakistani businessman observed, "More significant than their effect on the cost of production was their effect on labor's attitude toward work."[73] These changes aggravated the effects of an aging capital stock, resulting in significant productivity declines in large-scale textile manufacturing.

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[71] Adams and Iqbal (1983) cite anecdotal evidence regarding the partitioning of larger plants in the Karachi area.

[72] Ibid., p. 186

[73] Quoted in Adams & Iqbal (1983), p. 190

The Bhutto government also adopted trade policies which ultimately were detrimental to the textile industry. Bhutto's most dramatic trade policy intervention was the 53 percent devaluation of the rupee in 1972. In principle, a devaluation would benefit an export-oriented industry, such as textiles, by increasing its competitiveness in world markets. In anticipation of windfall benefits to the textile industrialists resulting from the devaluation, the Government accompanied the devaluation with export duties of 40 percent on yarn and 35 percent on cloth.[74] Nonetheless, APTMA estimated a net gain (e.g. benefits of devaluation less the export duties) to textile manufacturers of 15 to 24 percent per unit of exports.[75]

Most of these net benefits were erased by the devaluation's effect of increasing the costs of imported machinery, on which the textile manufacturers were heavily dependent. In addition, the Government imposed a 50 percent import duty on weaving machinery, along with new duties on imported dyes and chemicals.

The net effect of Bhutto's three-pronged attack on the cotton industrialists was a dramatic destabilization and decline in Pakistan's yarn and cloth exports. The trends are described in Chapter Eight, below. Figure 8.3, for example, shows that yarn exports had peaked at over 150,000 metric tons in 1971/72, following nearly a decade of rapid growth; these exports had declined to less than 50,000 tons by 1977/78. Similarly, figure 8.5 shows that cloth exports peaked in 1974 at 77,000 MT after growing steadily under the Ayub government, yet fell to 37,000 MT in 1977.

It would be wrong, however, to attribute these declines entirely to Bhutto's anti-industrial politics. In addition to the effects of the textile industry's aging capital stock, textile exports suffered from the loss of assured markets in East Pakistan in 1971, and the worldwide recession starting in 1973/74. The global recession resulted in reduced international demand for textile exports, as well as increased protectionism in the developed countries.

In the rural areas, as noted above, the PPP's primary support came from the large landowners, despite Bhutto's rhetoric promoting the interests of small farmers. Land reform provides the best example of the difference between Bhutto's words and actions in the rural sector. Upon entering office, Bhutto promised sweeping land reforms to redress the highly skewed distribution of land ownership. In reality, the land reforms were fairly mild and easily sidestepped by the large holders. Thus the PPP maintained its support among the landed rural elite, from which Bhutto himself came.

This practice, in part, reflected the absence of a well-articulated support for the PPP from the dispersed and relatively unorganized small holders and rural landless. The local

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[74] Yarn export duties from 1971 to 1974 were reported in table 6.5, above.

[75] Cited in Adams & Iqbal (1983), p. 188

landlords retained great influence in the countryside, and Bhutto courted their support. In addition to moderating his approach to land reform, Bhutto drew the support of large farmers by increasing the procurement prices for raw cotton, which tended to be grown primarily on the larger farms. Indeed, the promotion of rural interests was a large part of the political justification for the nationalization of the cotton trade by the CEC. As the CEC chairman in the late 1970s explained, past seed cotton prices were

> "... manipulated by vested interests dominating the [Karachi Cotton Association]....The growers have no voice and no representation at all....An active sympathy for support and incentives to the grower is, therefore, very rightly the cornerstone of the Government policy which realizes that his toiling efforts should be well compensated and he should be given all cover and protection against exploitation in the KCA."[76]

This statement, consistent with the PPP's rhetoric, was a clear expression of the Government's antagonism towards the large industrial and trading cotton interests and its interest in promoting the interests of the PPP's landed rural constituents.

The Zia government attempted to revive the textile industry. Among Zia's early initiatives in this regard was his institution of a 7.5 percent compensatory rebate for yarn exports. In fact, the large cotton industrialist families survived the Bhutto years, despite the downturn in their industry. Many of the families had diversified into other areas in response to the PPP's antagonistic policies. Yet, they also retained their textile interests: in 1977, the top eleven industrial families still owned approximately one-half of the textile industry's assets, with the top four families owning 27 percent.[77]

Burki notes that the Zia government surprised and somewhat irritated the business community by not denationalizing the industries taken over by Bhutto.[78] Rather, Zia's economic managers concentrated on improving the performance of the state-run industries. The CEC provides an excellent example. Zia maintained the CEC's monopoly on cotton exports until virtually the end of his tenure. As described in Chapter Three, private cotton traders were only allowed to re-enter trade in 1987/88, and then under close control by the CEC.

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[76] From an article by Nusrat Hasan, Chairman, CEC, included in the appendix to Werner International (1979), p. 592

[77] Information from APTMA, cited in Adams & Iqbal (1983), p. 177.

[78] Burki (1991), p. 14

Zia also continued Bhutto's policy of preferential treatment of the power loom sector.[79] In his behavior toward the spinning industry, Zia was somewhat inconsistent. In 1986, when lint prices were high, the Government provided generous input subsidies to the spinners, to ensure their profitability. The following year, the Government significantly raised the export tariff on yarn.

Chapter Four's detailed description of the "benchmark" pricing system, in essence, describes Benazir Bhutto's approach to the cotton and textile industry. In short, she continued the tradition of extracting rents from cotton producers in order to provide subsidized lint cotton to the spinning industry. This policy was unpopular in the cotton growing regions of Punjab, and gave political ammunition to Nawaz Sharif, that region's Chief Minister and primary opponent of Benazir Bhutto. Sharif exploited this issue in public meetings as part of his attack on the PPP Government.[80]

5.3 Summary

One can generalize about agriculture's role amidst the shifting political coalitions of Pakistani politics in the following way: the Ayub government drew its political strength from the large industrialists, at the expense of agriculture; Bhutto's support, in contrast, relied more heavily on the rural sector and excluded industrial interests, while Zia sought to win the allegiance of both groups. Benazir Bhutto, during her short and turbulent time in office, generally continued Zia's approach. Benazir's successor, Nawaz Sharif, is an industrialist who has undertaken an aggressive policy of privatization.

Table 4.2 picked out three years' effective protection coefficients for cotton: 1965/66, 1975/76, and 1983/84. Respectively, these years are representative of Ayub's, Bhutto's, and Zia's policies toward cotton. Although cotton was negatively protected in each period, the implied rate of taxation was highest under Ayub (approximately 50 percent), lowest under Bhutto (just over 30 percent), and intermediate under Zia (approximately 40 percent).

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[79] Pakistan & Gulf Economist, August 23-29, 1986, p. 9

[80] Pakistan & Gulf Economist, December 16-27, 1989, p. 8

PART II -- COTTON AND TEXTILE TRENDS

Ch. 6 Trends in Area, Yield, and Production of Raw Cotton
Ch. 7 Trends in the Production of Cotton Yarn and Cloth
Ch. 8 Trends in the Export of Raw Cotton, Yarn, and Cloth
Ch. 9 The Role of Varieties, Research, and Inputs in Cotton Production

6. TRENDS IN AREA, YIELD, AND PRODUCTION OF RAW COTTON

Production of any commodity can be disaggregated into area devoted to cultivating that crop and yield per hectare. This chapter traces the trends in area, yield, and production of cotton in Pakistan since independence.

6.1 Area

Area under cotton cultivation has increased fairly steadily since the 1930s. Figure 6.1 shows area devoted to cotton production for Pakistan since 1947/48.

Total area devoted to cotton has more than doubled since independence, increasing from 3.1 million acres in 1947/48 to 6.328 million acres in 1988/89. This reflects an average annual growth rate of 1.9 percent.[81] For the period since 1977/78, this rate has increased to about 3 percent per year.

Nearly all of Pakistan's cotton is grown in the provinces of Punjab and Sind. Figure 6.2 shows the relative contributions of Punjab and Sind to total cotton area since 1971/72.

Cotton area in the Punjab tended to be approximately three times that in Sind. Since 1971/72, however, the average annual growth rate in Sind was 2.4 percent, compared to an average annual increase of 1.6 percent in Punjab.

[81] Calculated from a semilog regression of area on time.

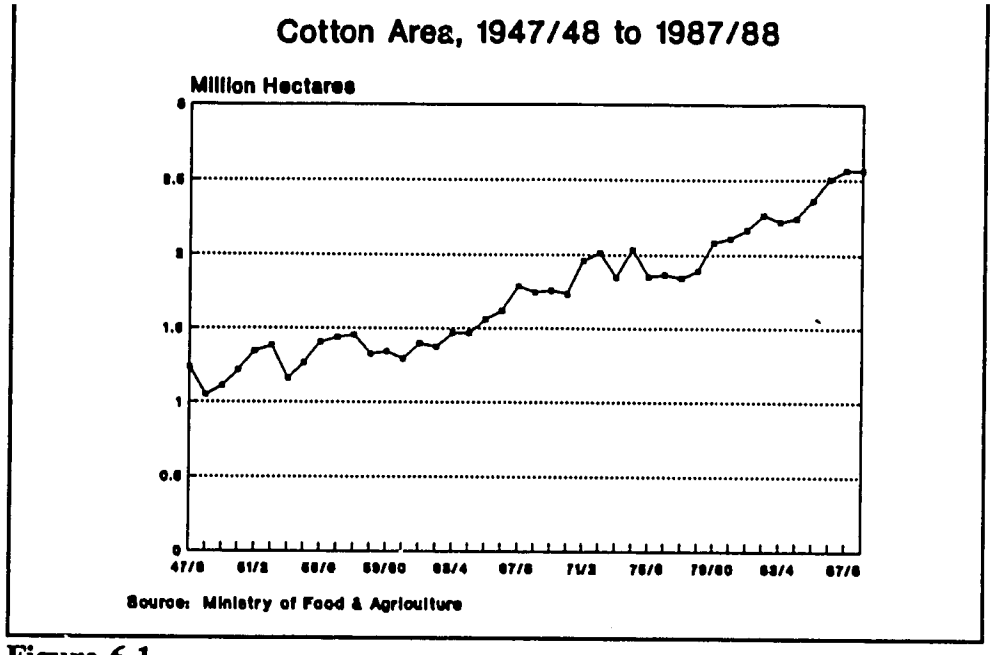

Figure 6.1

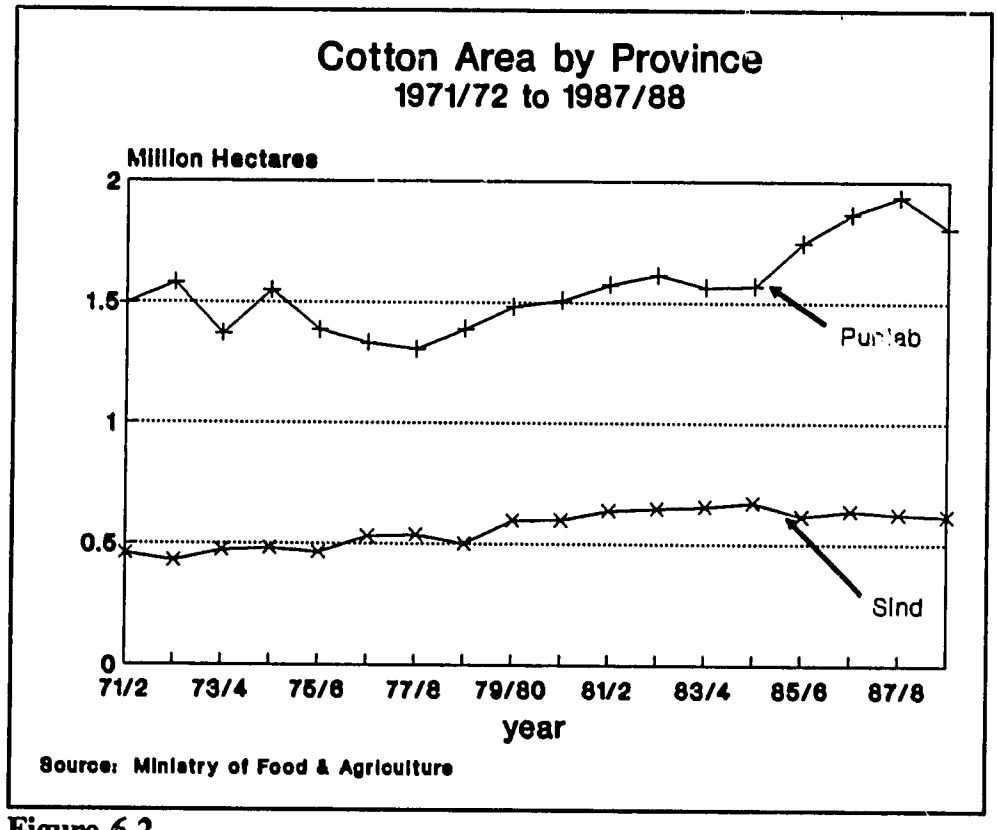

Figure 6.2

6.2 Yield

Despite its major role in Pakistan's crop system, yields in cotton have tended to be low compared with other major producing countries. Figure 6.3 shows average Pakistani cotton yields as compared with yields in India, Egypt, and the world average.

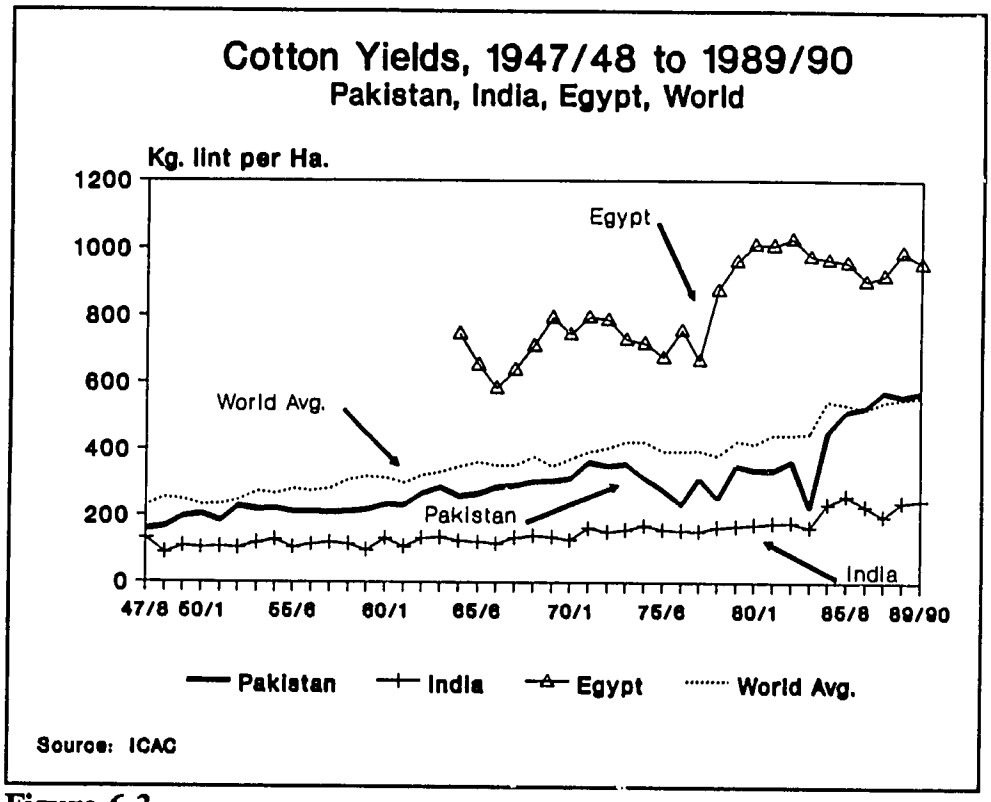

Figure 6.3

Until 1986/87 Pakistan was consistently below the level of average world yields, despite the country's almost ideal growing conditions. On average, world yields were 27 percent greater than Pakistan's, though Pakistan's yields were just over twice that of neighboring India. In contrast, Egypt, which produces longer staple varieties than Pakistan, has obtained yields on average 36 percent greater than Pakistan's.

The growth rate of Pakistan's yields has been impressive. At the time of independence, Pakistan's average cotton yield was 159 kilograms per hectare. From 1947/48 to 1989/90, cotton yields in Pakistan increased by 2.3 percent per year, faster than the annual growth rate in India (1.95 percent) and the world average (2 percent). By 1971/72, Pakistan's cotton yield had increased to 361 kg/ha. Since 1979/80, yields in Pakistan have grown at the remarkable rate of 6.9 percent per year. By 1988/89, Pakistani yields had reached 585 kg/ha. As discussed below, the primary reasons for this recent increase were the development of several new varieties released in the early 1980s, and rapid increases in

area sprayed with insecticides.[82] Yet, one needs also to consider the stability of these increases. Yields in Pakistan were significantly more variable than in the other countries. The coefficient of variation for yields in Pakistan since 1947/48 has been .36, compared with .29 in India, and .16 in Egypt.[83] This suggests that cotton producers in Pakistan have faced significantly greater quantity risk than those in many other countries.

It is also interesting to observe yield trends by province within Pakistan. As noted above, nearly all of Pakistan's cotton production takes place in either the Punjab or Sind. Figure 6.4 illustrates the trends in these two provinces since 1971/72.

Figure 6.4 shows a dramatic shift in the relative yields of Punjab and Sind. From 1971/2 until 1983/4, cotton yields in Sind were consistently and significantly higher than those in the Punjab. Yet, yields in the Punjab shot up after 1983/4 and now far surpass those in Sind. The primary reasons for this change included: the dramatic improvements in pest scouting and pest control practices in Punjab (which have not been replicated in Sind), superior seed multiplication and distribution in Punjab, the increasing attractiveness of sugarcane relative to cotton in Sind, and the severe law and order problems experienced in Sind.[84]

The more obvious explanation -- that several highly successful varieties were released for Punjab and not for Sind -- does not appear to explain these trends. Experimental trials have shown that the "Punjab" varieties (NIAB-78 and MS-84) can yield nearly the same level in Sind as in Punjab, when grown under carefully managed conditions.[85]

Including the recent surge in the Punjab, that province's yield growth rate for 1971/72 to 1989/90 was 4.4 percent per year. Over the same period, Sind yields showed no significant trend. Yet, until 1983/84, there was no significant trend in the Punjab either.

Given the general lack of trend in yields, one might wonder why the area under cotton increased steadily. Ender suggests that the reason lay in the greater **profitability** of cotton production.[86] For instance, calculations of per acre profit using 1985/86 data suggest

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[82] Z. Ahmed (1989)

[83] The coefficient of variation is calculated as σ/μ, where σ = standard deviation and μ = mean.

[84] Interviews with Dr. Zahoor Ahmed, Director, Cotton Research Institute, Multan, July 3, 1991, Dr. Husaini Jagirdar, and Dr. Aktar Hai, Applied Economics Research Center, University of Karachi, July 2, 1991.

[85] Ibid.

[86] Ender (1990), p. 5

that cotton production earns Rs. 3,434 per acre -- 16 percent more than sugarcane, which was the next most profitable crop.[87]

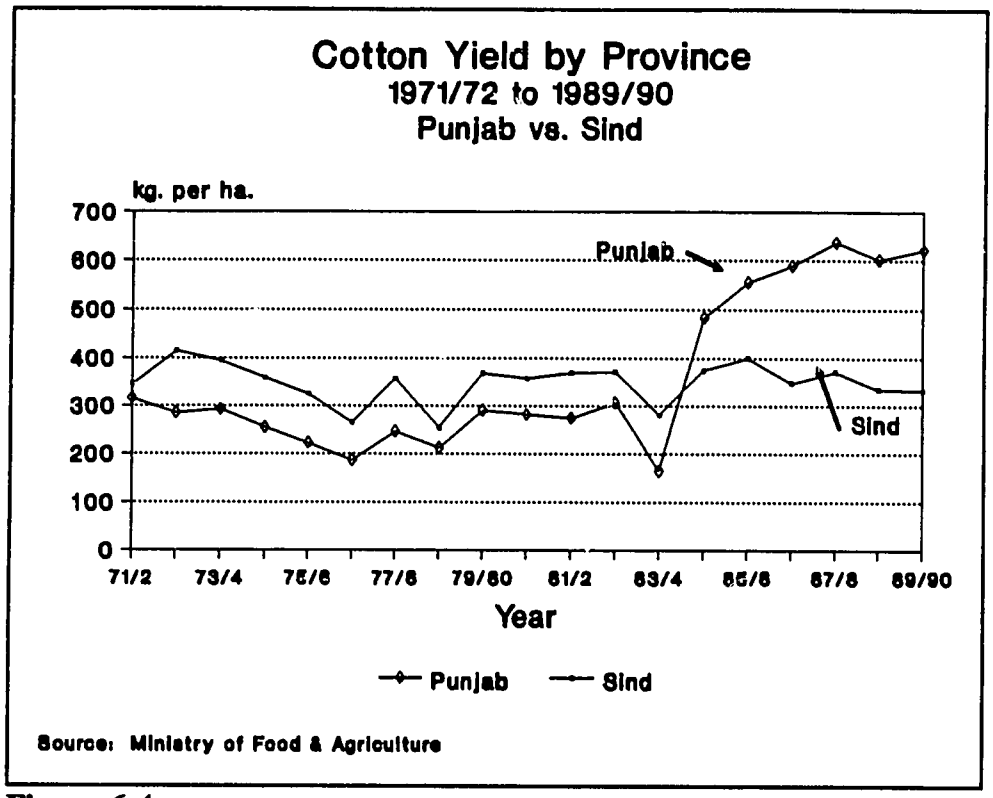

Figure 6.4

6.3 Production

The yield increases beginning in 1983/84 in the Punjab contributed to a dramatic increase in total cotton production. Figure 6.5 shows the trend in total cotton production in Pakistan since independence.

Figure 6.5 demonstrates the boom in cotton production beginning in 1983/4. From independence to 1971/72, cotton production grew by 4.6 percent per year, increasing from 1.1 million to 3.98 million Pakistani (375 lb.) bales.[88] This steady increase was abruptly and dramatically reversed during the 1970s. From a high of 3.98 million bales in 1971/72, Pakistan's cotton production fell to 2.4 million bales by 1976/77 -- a decline of nearly 40 percent in five years. Various explanations for this decline are described in Part I of this

[87] From a study by the FAO, cited in Asian Development Bank (1986), Appendix 9, p. 3

[88] This study uses Pakistani bales of 375 lbs. (international bales weigh 480 lbs).

report. Yet, it is appropriate here to consider the nature of the demise of cotton during the 1970s.

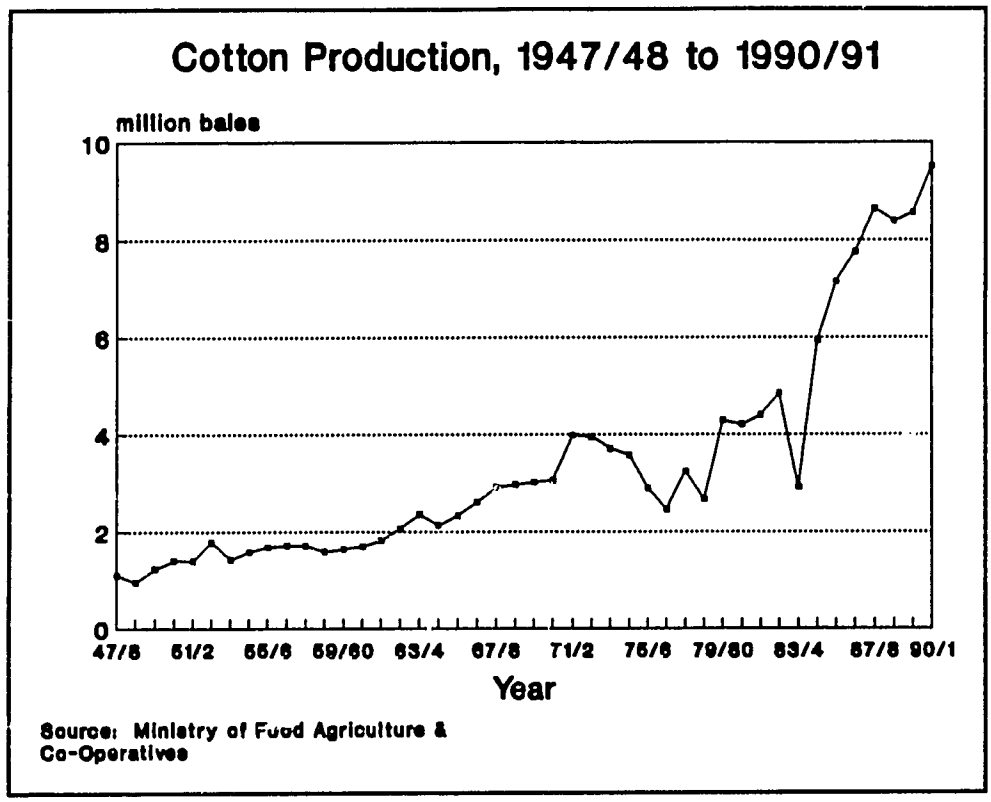

Figure 6.5

The fall in output was primarily a result of declining yields (as one sees in Figure 6.3), though Goldman found that reduced acreage in certain areas was due to crop substitution.[89] A succession of natural disasters hit cotton producers during that period: in 1973, they experienced severe mid-season flooding in the Punjab cotton areas, reducing cotton acreage; 1974 was a year of particularly severe pest attacks, severely reducing average yields. This began a three-year fall in cotton yields; and 1976 was a year of both flooding and boll worm infestation.

Cotton production regained its pre-1972 peak in 1979/80, growing for four years, until a major setback in 1983/84, when production fell to 60 percent of its 1982/83 level. Figure 6.3 suggests that this was a yield failure. Yet, following that one-year collapse, cotton production has experienced unprecedented growth. Even including 1983/84, the average yearly growth rate in cotton production since 1978/79 has been 10.4 percent. In

[89] Goldman (1977)

part, this rapid increase resulted from a rapid increase in area sprayed for pest control, following a massive infestation in 1983/84.[90]

As Figure 6.6 shows, most of this increase occurred in the Punjab. From 1971/72 to 1989/90, the Punjab experienced an annual production growth rate of 6.3 percent, with the rate accelerating to 15 percent since 1980. In contrast, production in Sind grew at the rate of 2.4 percent per year from 1971/72 to 1989/90.

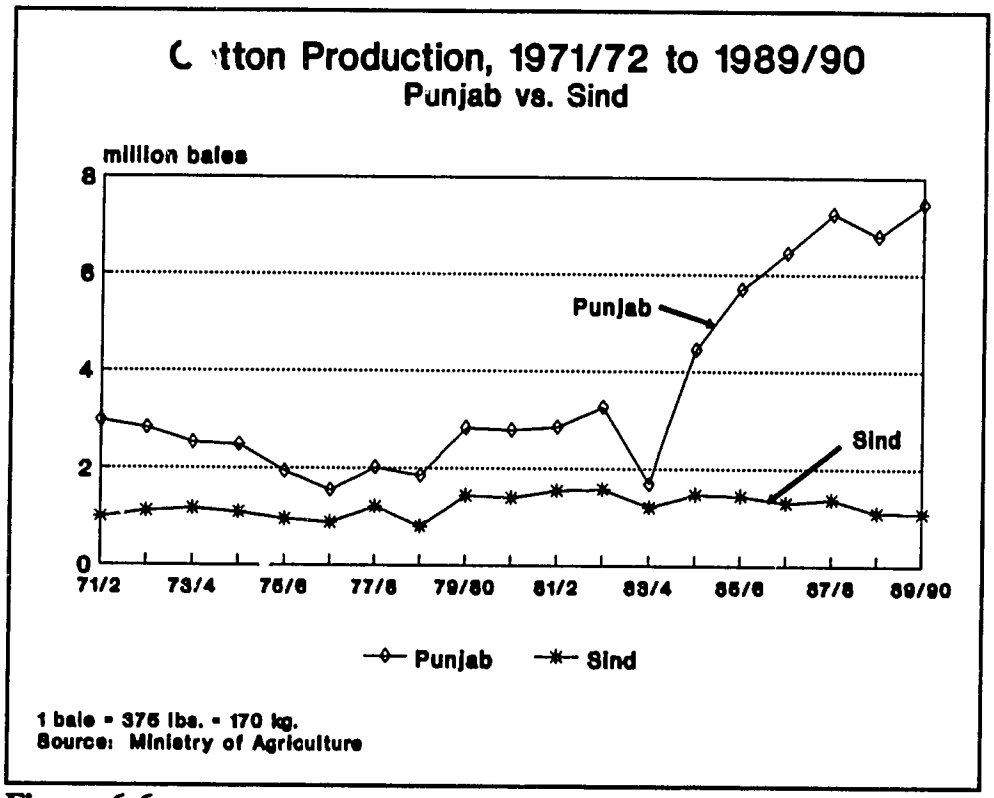

Figure 6.6

From 1971/72 to 1983/84, the Punjab accounted for an average of 67 percent of total production while Sind contributed 33 percent. In 1989/90, Punjab's share had risen to 87 percent, compared to Sind's 13 percent. As Figure 6.4 demonstrated, most of the difference in provincial output is explained by the dramatic yield increases in the Punjab (the reasons for which are summarized above).

[90] Trends in input use in cotton production are described in Section 5.3 below.

Pakistan's share of world cotton production has also increased in recent years. As Figure 6.7 illustrates, Pakistan's share hovered between three and five percent from 1947/48 until the early 1980s. The recent surge in Pakistani production, however, has driven the country's share of world cotton production up to approximately eight percent since 1985/6.

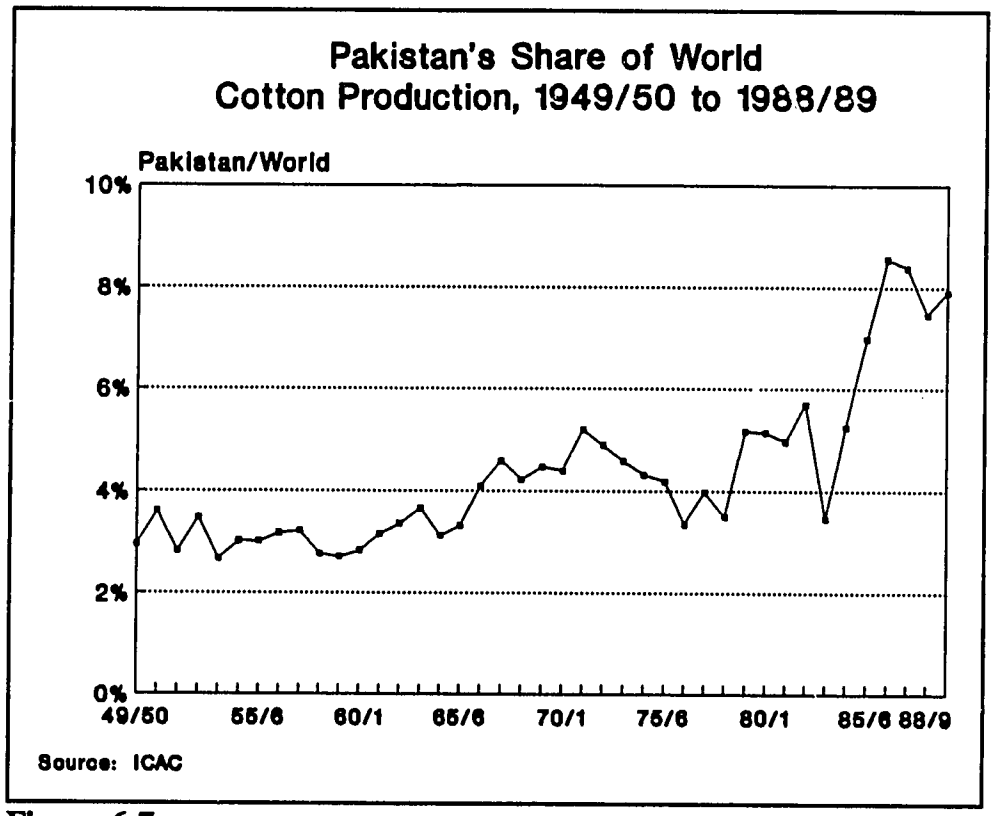

Figure 6.7

The recent surge in cotton production has also had a dramatic impact on the production of cotton yarn and cloth. The following chapter describes these textile production trends.

7. TRENDS IN THE PRODUCTION OF COTTON YARN & CLOTH

This chapter traces trends in the cotton-based output of Pakistan's textile industry. These products include thread, yarn, grey cloth, and garments. The primary focus of this chapter is on yarn and cloth production. In addition, this chapter looks behind the production statistics, providing an overview of developments in the structure of the industry.

7.1 Textile Sector Capacity

Two activities -- spinning and weaving -- dominate the textile sector. At the time of independence, Pakistan had approximately 2,000 looms (for weaving cloth) and 73,000 spindles (for spinning cotton yarn). This capacity was divided among six mills, five of which were located in the Punjab.

Pakistan's textile industry consists broadly of two categories of operations: formal sector mills, and informal power looms (usually defined as having less than four looms per unit).[91] The "informal" sector is distinguished by its exemption from excise taxes and other regulations. The power loom sector originated in the late 1950s and began an extended period of extremely rapid growth in the early 1970s.

The textile industry in general grew rapidly during the 1950s and 1960s, spearheading the national industrialization effort. However, the fortunes of the formal mill sector changed in the early 1970s. Figure 7.1 traces the expansion and decline of the formal mill sector, as measured by the installed and working capacity in looms.

Figure 7.1 reveals several important aspects of the development of textile capacity in Pakistan. After 1972/73, formal sector capacity declined continuously, both in terms of working and installed capacity. During this period of decline, the divergence between installed and working capacity tended to increase, implying lower levels of capacity utilization in the formal sector.

The exact number of power looms in the informal sector is unknown; yet Figure 7.1 records estimates made by various sources at different times. From these estimates, it is clear that the tremendous increase in capacity in the informal textile sector displaced the formal sector. In many cases, formal weaving operations were simply sub-divided into units of four looms, thus exiting the "formal" sector and avoiding taxes and regulation.[92] Thus,

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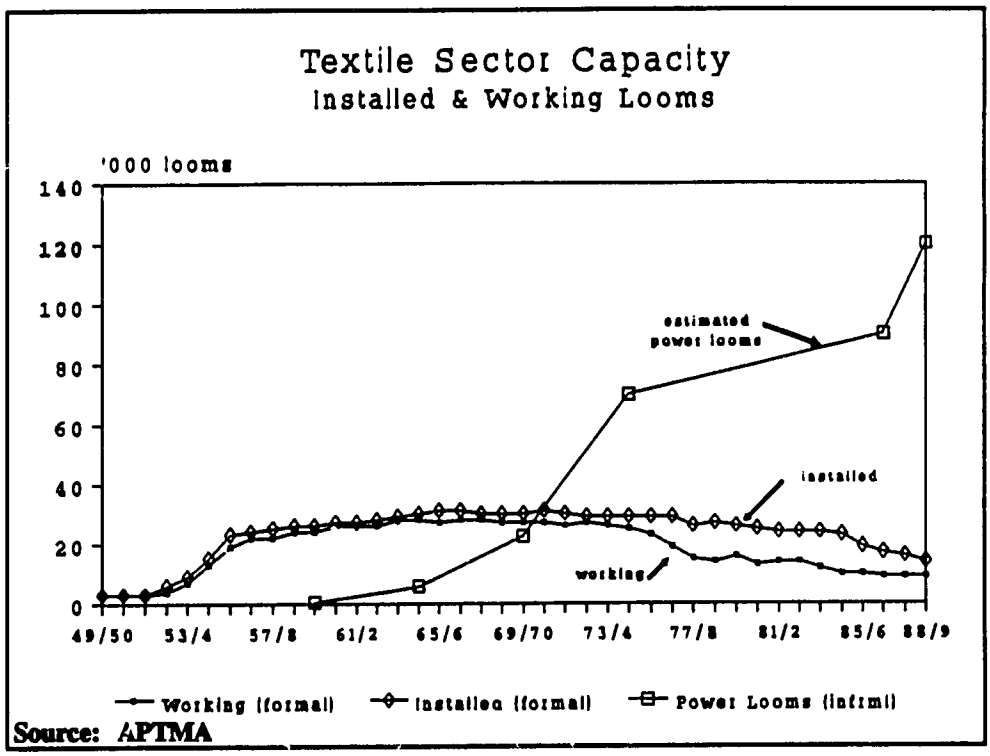
[91] The terms "informal mill" and "power loom" are used interchangeably.

[92] The precise incidence of this behavior is unknown, though S.M. Usman, Secretary General, APTMA, suggested in an interview (6/30/91) that the percentage of power looms formerly operating in the formal sector was quite high.

weaving capacity migrated to the informal sector, leaving the formal mill sector to concentrate on spinning.



Source: APTMA

Figure 7.1

The periods in which power loom sector capacity grew fastest were also the years of greatest decline in capacity utilization in the formal sector. Average capacity utilization (measured by the ratio of working looms to installed capacity) for the formal sector from 1949/50 to 1973/74 was 90 percent; the average since 1974/75 has fallen to 59 percent.[93]

Several factors coincided in the early 1970s to undermine the previous success of the formal textile sector. One factor was the loss of assured markets in Bangladesh following that country's successful war of independence against Pakistan in 1971. The next year, the Government of Pakistan devalued the Rupee, raised import duties on looms and related equipment, and imposed significant export duties on cotton yarn and cloth. The devaluation was particularly hard on the formal mill sector, which imported nearly all of its machinery. The All-Pakistan Textile Mills Association (APTMA) calculated at that time that mill costs rose approximately 15 percent as a result of the devaluation.[94] In addition, as noted above,

[93] Calculated from APCOM (1990), Vol. II, Annex III-11

[94] APTMA study cited in Adams (1983), p. 188

the power loom sector was exempted from excise taxes and other government regulations, thus increasing their natural cost advantage over the mills.[95]

7.2 Yarn Production

Figure 7.2 illustrates the trend in Pakistan's yarn production. Yarn production since 1953 has grown at a rate of 5.7 percent per year. Between 1960 and 1973, yarn production doubled (from 200,000 metric tons to 400,000), and it doubled again between 1973 and 1989. Indeed, since 1984, the rate of increase in yarn production has skyrocketed. The increases in cotton production described in the preceding chapter paved the way for this rapid growth in yarn production. Yet, it's interesting to note that the stability of the increase in yarn production varied substantially over time.

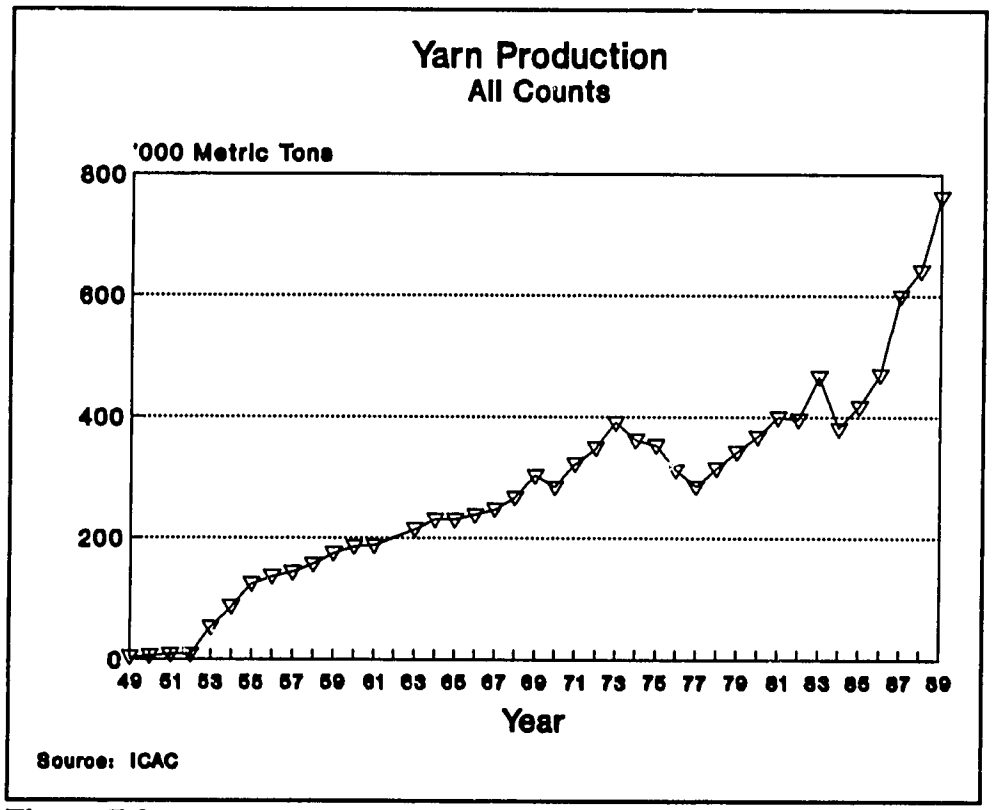


Figure 7.2

Figure 7.3 compares the variability of cotton production and yarn production for each decade since 1950. The coefficient of variation for yarn production from 1953 to 1959 was 0.31. Production was more stable around its trend in the 1960s, when the coefficient of

[95] Some of these factors, as well as conditions in Pakistan's export markets, are considered further below.

variation fell to 0.15, and more stable, still, in the 1970s, at 0.10. Yet, in the 1980s, a time of particularly rapid growth, the coefficient of variation of yarn production increased to 0.26.

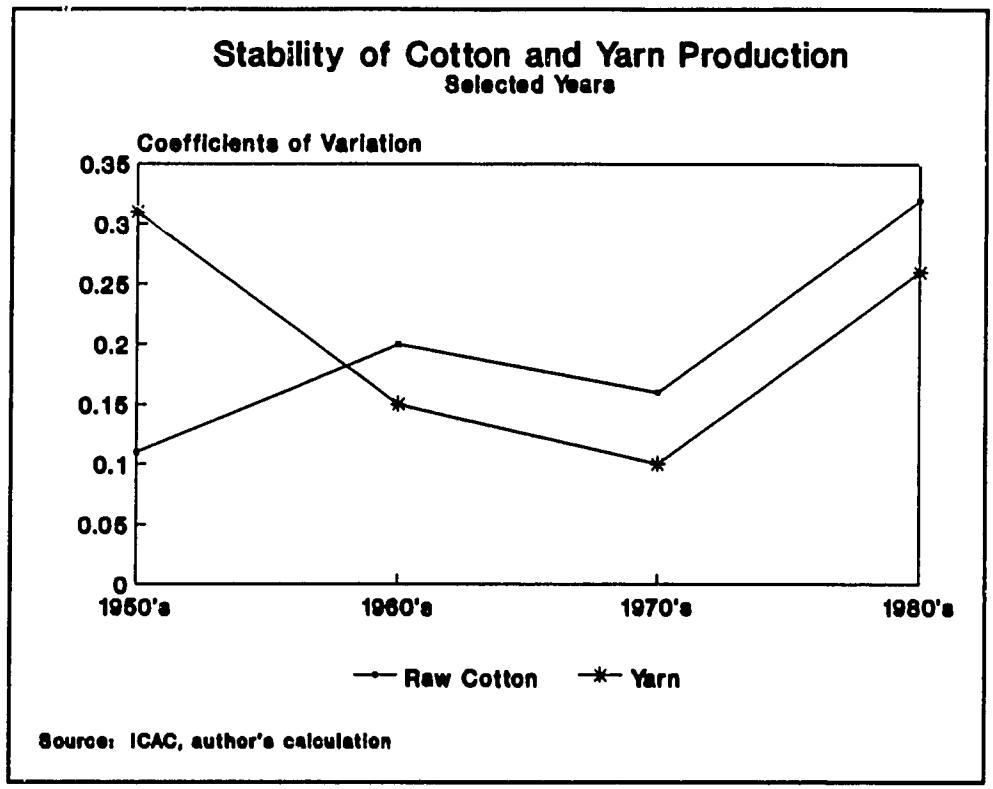


Figure 7.3

Yarn output is clearly dependent on cotton production. Indeed, variations in cotton production account for 75 percent of the variation in yarn production since 1950.[96] In each decade since the 1960s, the stability of output in yarn has paralleled that of cotton, though cotton production has been consistently more unstable than yarn output. The availability of carry-over stocks may play a role in stabilizing yarn production relative to cotton production. Yet, it is clear that the fortunes of the textile industry are closely tied to those of cotton producers. The critical factor separating them is cotton export policy, which was treated in detail in Chapter Four.

The rapid expansion of Pakistani yarn production in recent years has also gained it a significant role in world cotton yarn supply. As Figure 7.4 reflects, Pakistan's share in world yarn production has risen from virtually nothing in the early years after independence to approximately 5 percent in the late 1980s.

[96] That is, the R^2 from a regression of yarn output on cotton output was 0.75.

Figure 7.4 also compares Pakistan's share of global yarn production with its share of global cotton production. The similarity of these two trends over time further reinforces the dependence of yarn on cotton output.

It is also apparent that Pakistan's share of cotton production was significantly more variable than its share of yarn production. From 1953/54 to 1988/89, the coefficient of variation of Pakistan's yarn share was 0.27, compared with 0.34 for its world cotton share. This difference, in part, may reflect the relative stability of the spinning technology over farm production, despite the former's dependence on the latter as its primary input.

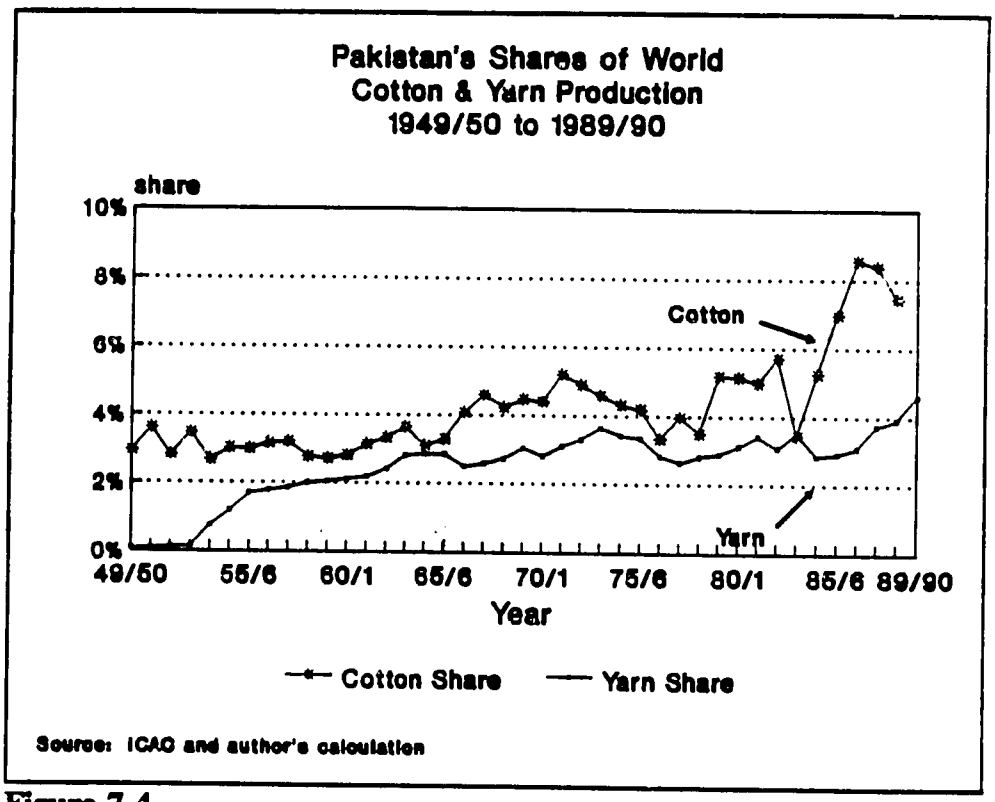


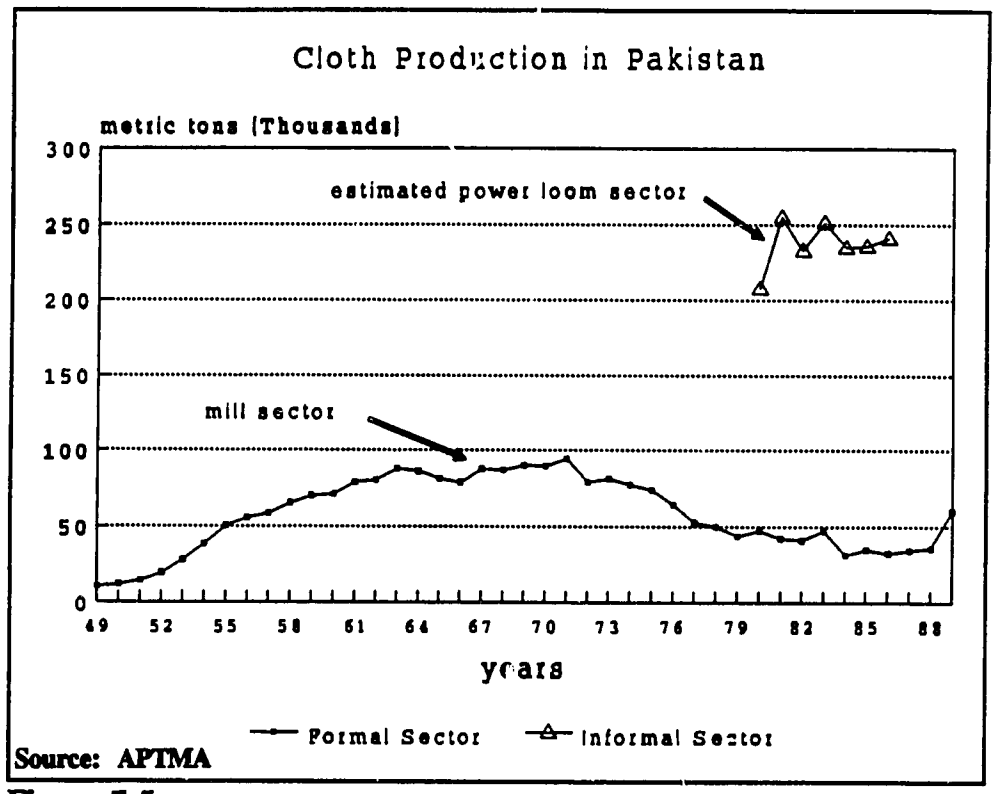
Figure 7.4

7.3 Cloth Production

Cloth production in Pakistan's formal mill sector has followed an uneven course during the period since independence. As figure 7.5 shows, formal cloth production grew rapidly until 1971, and then fell even more rapidly until 1988. From 1949 to 1971, mill sector cloth production grew at an annual rate of 7.7 percent; from 1972 to 1988, the rate fell to -8.9 percent.

This apparent catastrophe for Pakistan's cloth production is, in fact, only a catastrophe for the formal mill sector. The steep decline in formal sector cloth production simply reflects the displacement of the formal mill sector by the power loom sector, the

capacity of which has increased six-fold over the past twenty years. Although the exact output level of the power loom sector is unknown, Figure 7.5 provides several years' estimates from the Textile Commissioner's Organization.[97] These estimates were derived as the residual of yarn exports, mills consumption, and ancillary industries requirements deducted from total yarn production. These estimates suggest that by the 1980s, cloth output in the power loom sector was approximately seven times the level of output remaining in the formal sector, with the margin between the two continuing to widen.



Source: APTMA

Figure 7.5

Pakistan's share of world cloth production has been quite low during most of the period since independence. The first years of independence, during which the formal sector still dominated cloth production, found Pakistan producing between one and two percent of the world's cotton cloth. For the period of the 1980s, when we have estimates of total cloth production (i.e. including the substantial proportion produced outside the formal sector), Pakistan's share of world cloth production rises to approximately three percent.

[97] Cited in Investment Corporation of Pakistan (1988), p. 11

8. TRENDS IN THE EXPORT OF RAW COTTON, YARN & CLOTH

Cotton and cotton textiles remain Pakistan's most important exports, as they have been since independence. Raw cotton exports in 1988/89 were the single most valuable export commodity, accounting for 20 percent of the total value of the country's merchandise exports. Moreover, in 1987/88, textiles (all types combined) accounted for 40 percent of Pakistan's total exports and 73 percent of manufactured exports.

This chapter traces the trends in the export of cotton and cotton textiles from Pakistan since independence. It first considers in turn cotton, yarn, and cloth exports, and then combines all three to examine the structure of cotton sector exports over time.

8.1 Exports of Raw Cotton

As Figure 8.1 reflects, Pakistan's cotton exports have been highly variable over time. There was no significant trend in cotton exports from 1947/48 to 1982/83. During that period, exports fluctuated fairly widely around a mean level of 150,600 metric tons. The coefficient of variation in these years was 0.5. Cotton exports exploded in the 1980s in direct response to the explosion in cotton production. Since 1983/84 cotton exports have grown at the remarkable rate of 28 percent per year. It seems likely that this increase represents a jump to a new level around which exports may fluctuate for some time, rather than a continued growth path.

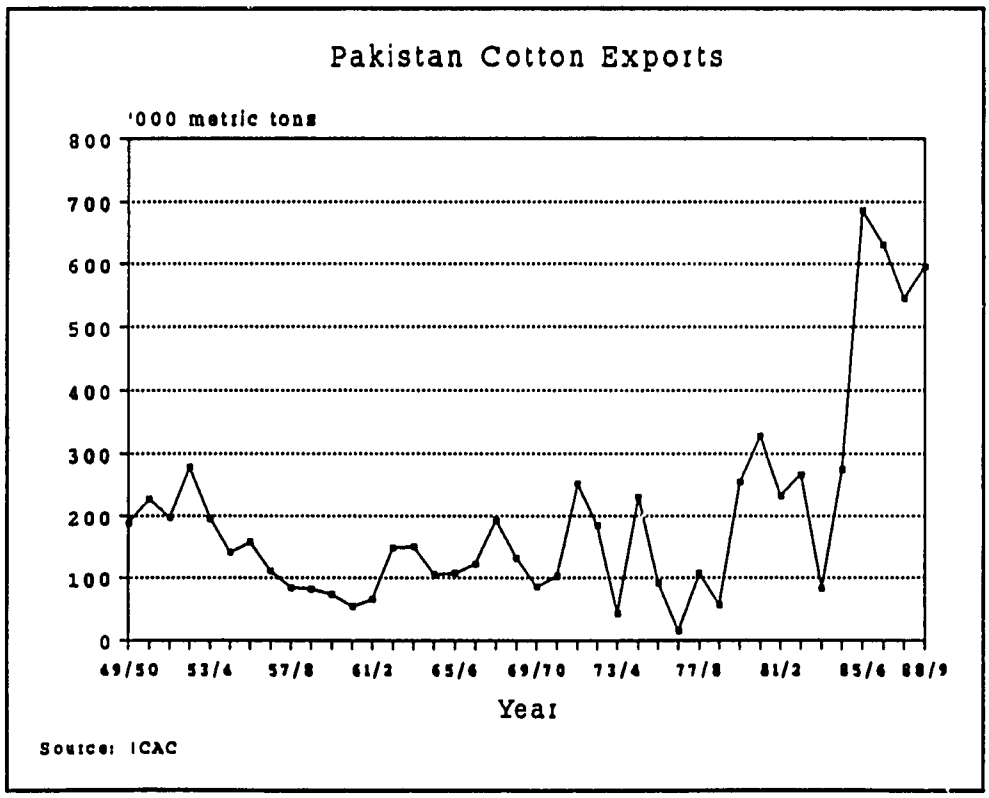


Figure 8.1

It is essential to remember, however, that the level of Pakistani cotton exports is a function, not only of cotton production, but of world market conditions, the level of investment in spinning, and shifts in the export policy of the Government of Pakistan, as well. The final section of this chapter will consider the relative shares of raw cotton, yarn, and cloth in the structure of total exports from the cotton sector.

Figure 8.2 shows the evolution of Pakistan's share of the world cotton market since 1952/53. As the graph reflects, Pakistan's share of international cotton trade has been highly variable over time. The average of Pakistan's share of world cotton trade was 5 percent, with a high coefficient of variation of 0.69 around this average. Yet, for the period 1952/53 to 1989/90, there was no significant trend.

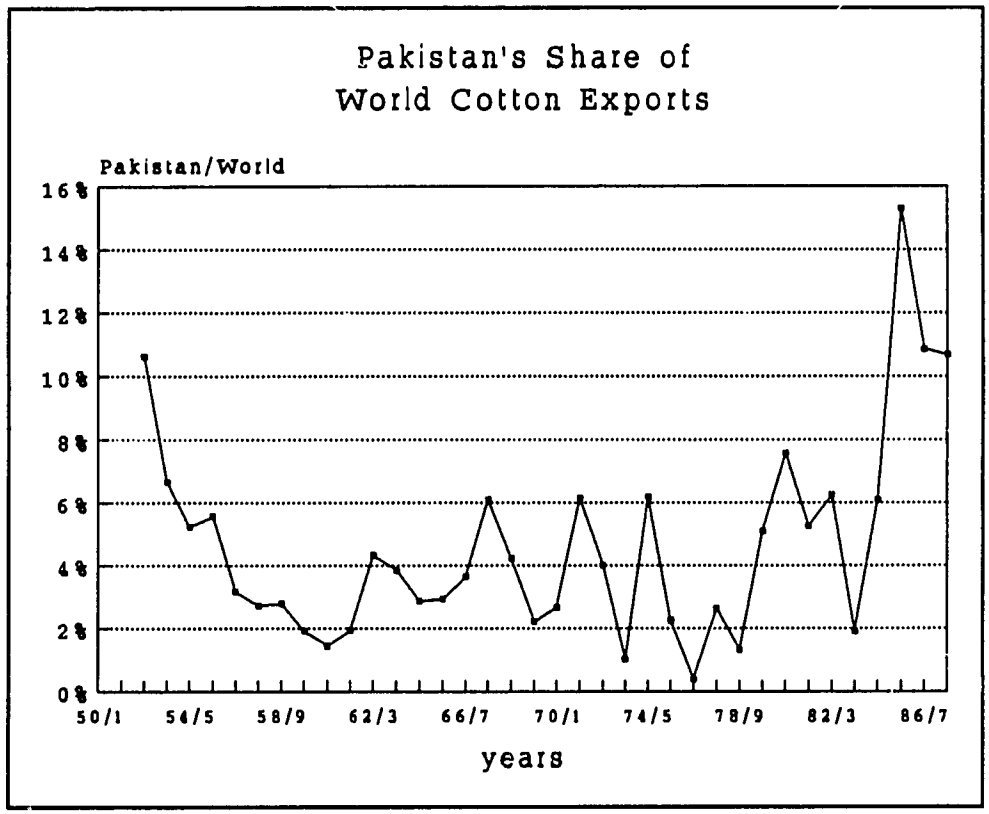


Figure 8.2
Source: ICAC and author's calculation

As with cotton production, Pakistan's share of the world cotton market has grown rapidly since the mid-1980s. This surge has increased Pakistan's share to over 10 percent of world cotton trade. In 1988/89, for example, Pakistan (at 435,000 MT of raw cotton exports) ranked third among the world's cotton exporters, behind the United States (which exported 1,676,000 MT) and the USSR (which exported 734,000 MT). This raises

significant questions as to whether Pakistan's export policy decisions affect the world price for raw cotton.[98]

Broadly speaking, the raw cotton that is not exported is spun into yarn, which is then either exported in that form or sold to domestic weaving concerns for cloth production. The following section traces Pakistan's role in the international yarn trade.

8.2 Exports of Cotton Yarn

Pakistan's yarn exports have shown a consistent and strong upward trend since 1955, when the country began exporting cotton yarn. As Figure 8.3 reflects, the growth in yarn exports has been fairly continuous, with an annual average increase of 10.5 percent since 1955. Pakistan's yarn exports grew rapidly throughout the 1960s, growing to over 150,000 MT by 1972. Yet yarn exports suffered extreme volatility from 1972 until 1977, a period during which raw cotton output declined by nearly 50 percent, following over two decades of growth.

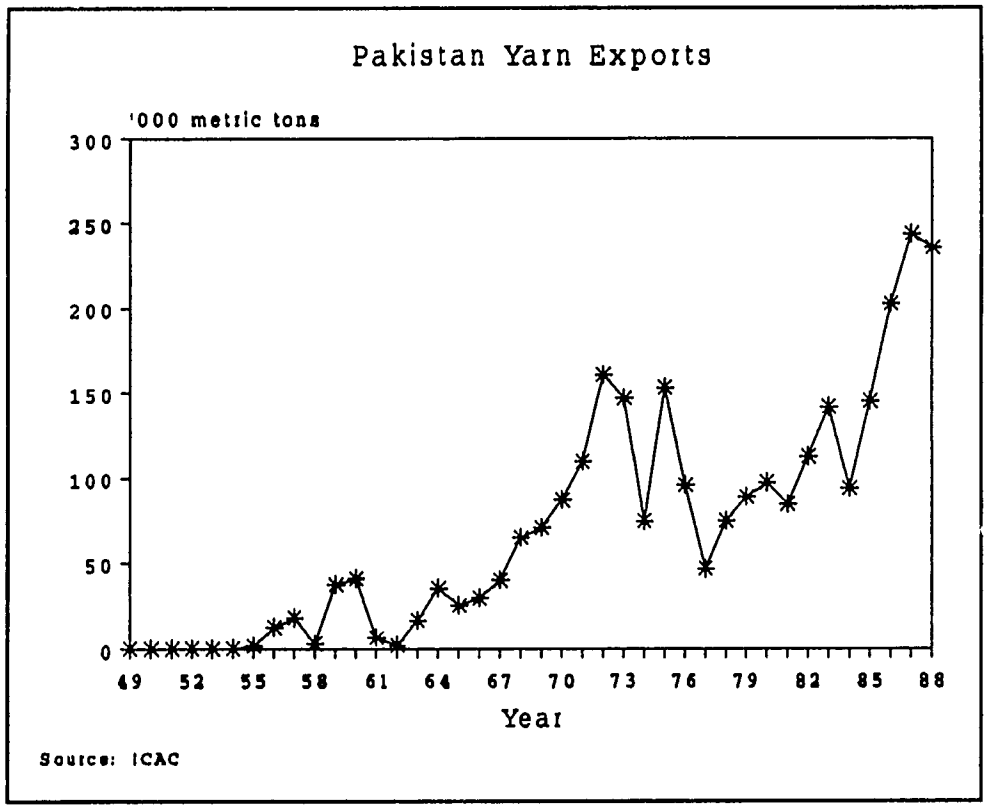


Figure 8.3

[98] Although it lies beyond the scope of this report, such an analysis would need to take account of the strict segmentation of international cotton trade by fiber quality, which results in significant price differences. These distinctions are considered below in the section describing international price trends.

The wide swings in yarn exports in the mid-1970s ended with exports in 1977 falling to approximately one-third of their 1972 level. Since 1977, howe 'er, the previous strong growth pattern has returned, surpassing the 1972 high in the mid-1980s, and climbing to nearly 250,000 MT by 1988.

Pakistan is currently a major player in the world yarn market. As Figure 8.4 reflects, Pakistan's share of the world yarn market has been as high as 32 percent, with the average share since 1955 being 15 percent. With a coefficient of variation of 0.71, Pakistan's role in world yarn markets has been slightly more unstable than its share of cotton markets. Yet, while the there was no trend in the cotton market share, Pakistan's share of world yarn trade increased by an average of 9 percent per year between 1955 and 1989. The period from the mid-1970s to the mid-1980s saw a slump in this share, though recent years reflect a return to previous levels of market share. Currently, Pakistan supplies approximately one-quarter of all cotton yarn traded internationally. Since 1980, Pakistan has been the world's largest yarn exporter in all but three years, when it was second to Korea once and China twice.

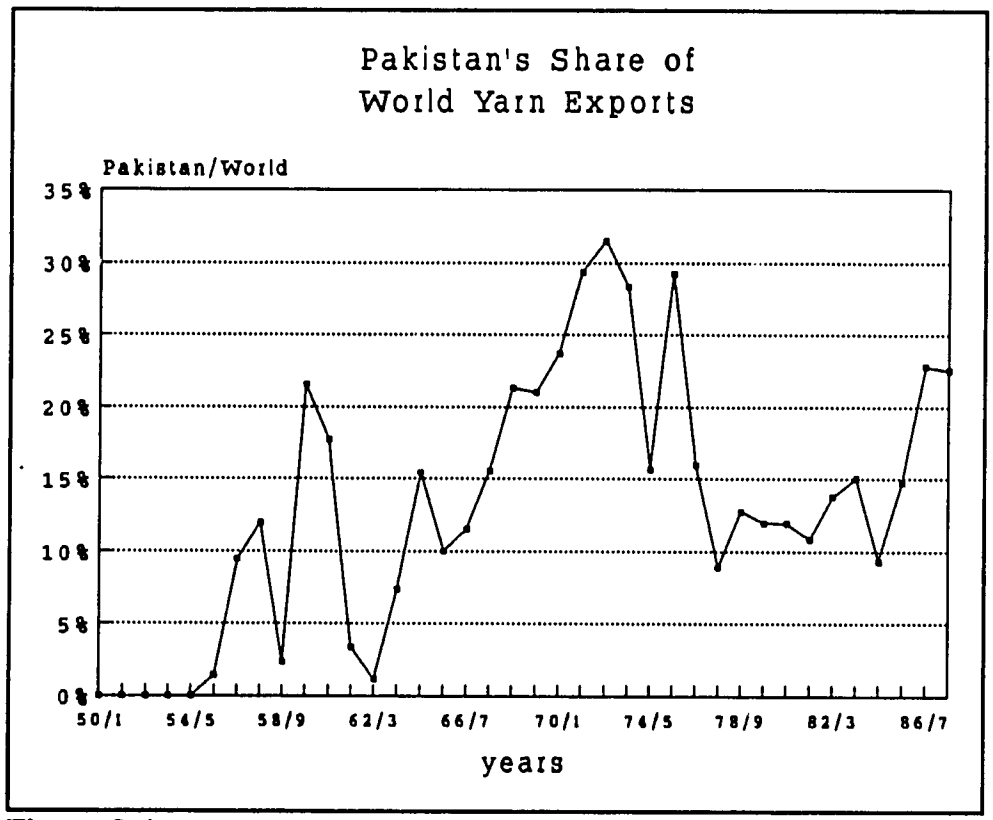


Figure 8.4
Source: ICAC

It is also interesting to note the high degree of volatility in this import source of foreign exchange earnings. For instance, between 1959 and 1962, Pakistan's share of world yarn markets fell from 22 percent to about 1 percent. A similar collapse occurred between 1975 and 1977, when Pakistan's world market share fell from 30 percent to under 10 percent.

8.3 Cloth Exports

Figure 8.5 summarizes the trend in Pakistan's cotton cloth exports. This market took off in 1956, and, since that year, has grown at the remarkable average rate of 20.7 percent per year. By 1974, Pakistan's cloth exports had risen to 77,000 MT, making it the world's leading cloth exporter that year, as it had been in the two previous years, as well. Falling raw cotton production in the first half of the 1970s took its toll on cloth exports, just as it did in the cases of cotton and yarn exports.

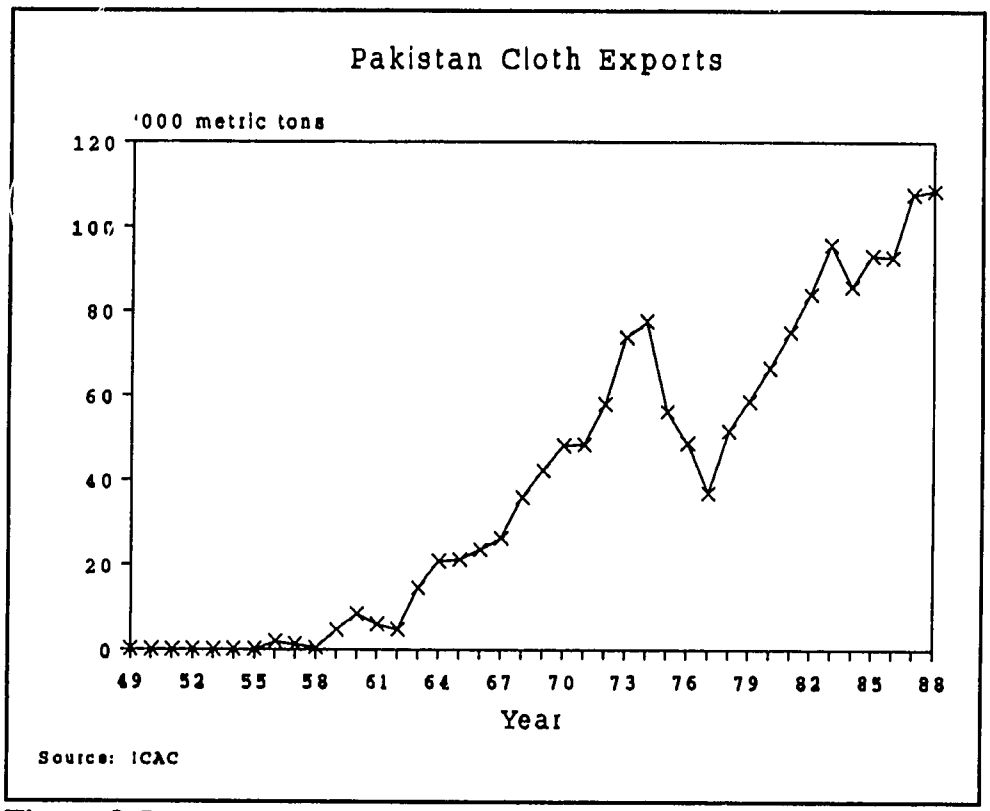


Figure 8.5

From its 1974 high of 77,000 MT, Pakistan's cloth exports fell by just over 50 percent in three years, bottoming out at 37,000 MT in 1977. Since 1977, cloth exports have resumed their pre-1974 rate of rapid growth, climbing to 108,600 MT in 1988. These dramatic downturns reflect the fact that Pakistan's cloth exports have been even more unstable than its cotton and yarn exports. The coefficient of variation for cloth exports since 1956 has been 0.85.

These levels of exports have made Pakistan a significant player in world cloth markets. Since 1956, Pakistan has supplied an average share of 8.6 percent of world cloth exports.

Pakistan's share of world cloth exports has grown at an average annual rate of 18 percent since 1956. As was the picture for yarn, Pakistan's world cloth market share grew rapidly from 1962/63 to 1974/75, when it peaked at 10 percent.

As Figure 8.6 shows, since 1974, Pakistan's share of world cloth exports has encountered two periods of steep decline. From 1974 to 1977, the share fell from 10 percent to 4.5 percent. A similar setback occurred in 1981/82, when the level fell nearly five points (an 87 percent decrease) in one year. That year, though was clearly an aberration, as is clear from the immediate jump in 1982 back to 6.7 percent of the world market. This volatility does, however, underscore the uncertainty of foreign exchange earnings from cloth exports.

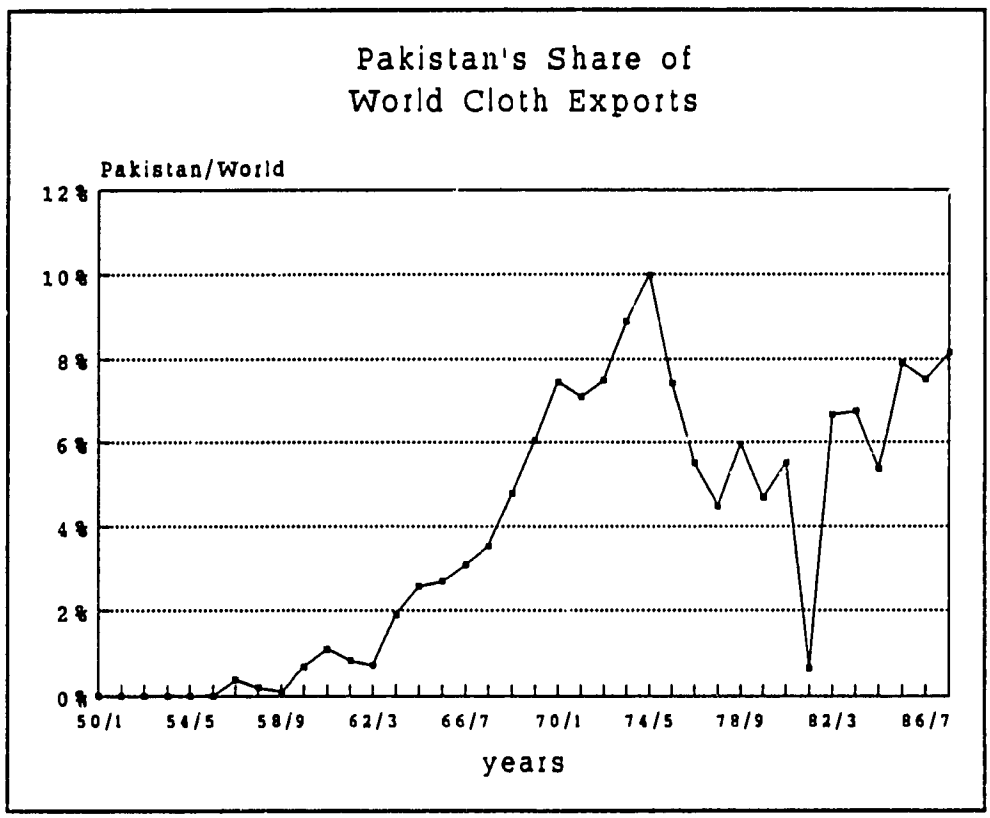


Figure 8.6
Source: ICAC

8.4 Composition of Cotton Sector Exports

As noted above, raw cotton is either exported in that form or spun into yarn domestically. That yarn, in turn, is either exported or sold domestically for weaving into cloth, which is then either exported or made domestically into finished goods. Thus, it can be misleading to examine the export trends in cotton, yarn, or cloth separately. For example, declines in cotton exports may reflect nothing more than an increase in yarn

exports. These shifts may occur in response to shifting world market conditions, as well as from policy decisions by the Government of Pakistan regarding textiles exports.

Figure 8.7 shows the percentage of total raw cotton production exported each year since independence. The steep initial fall in the share of raw cotton exported reflects the rapid development of Pakistan's cotton textile industry in the 1950s and early 1960s. Referring back to Figure 7.1, one sees the initial growth period in textile sector capacity in the period of steep decline in the share of cotton exported. Then, beginning in the early 1960s, the descent ended, and was replaced by a history of wide fluctuations with no significant trend.

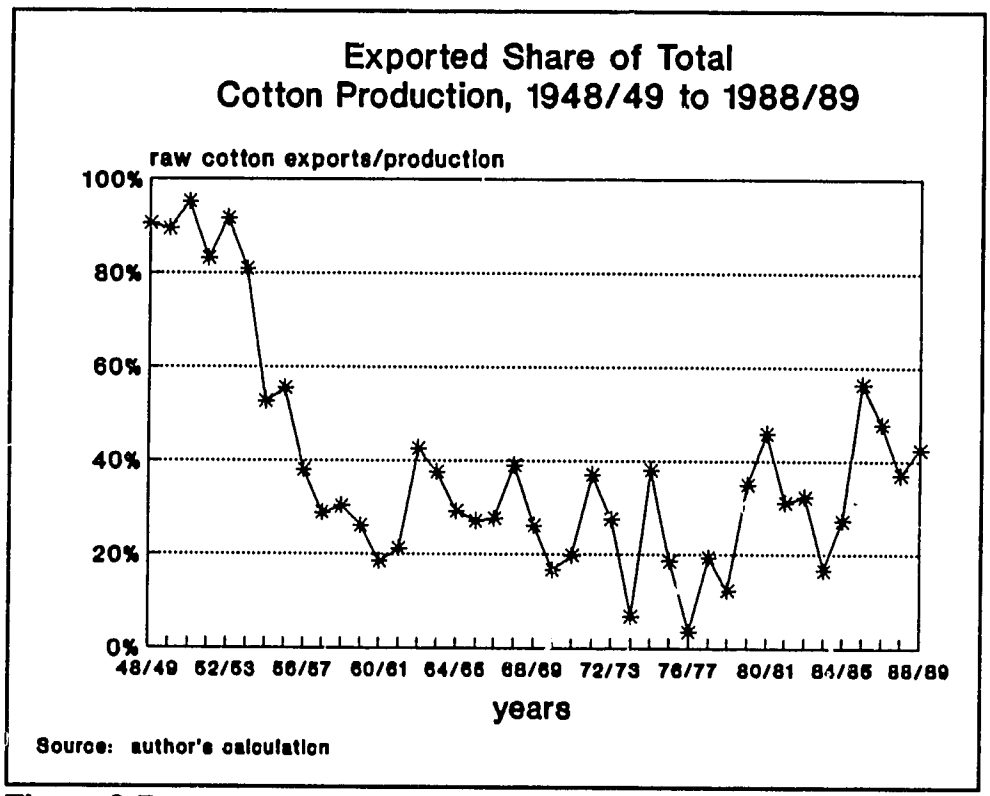


Figure 8.7

These fluctuations reflect shifts in a combination of factors, including domestic and international demand for cotton, relative world prices of raw cotton and textiles, fluctuating cotton production relative to domestic demand, and the shifting attitude of the Governments towards the interests of textile manufacturers versus cotton exporters. Since 1960/61, an average of 29 percent of raw cotton production has been exported in that form.

Foreign exchange earnings from these alternative forms of cotton export are a function of world price, as well as quantities. The following section summarizes world price trends for cotton, yarn, and cloth.

8.5 Cotton Sector Export Prices

This section provides a rough comparison of the export prices for Pakistani cotton and textiles with those of other countries and the market in general.

8.5.1 Raw Cotton

Figure 8.8 compares the trend of export prices (cif, Liverpool) for Pakistani cotton with that of the United States, and USSR, as well as the "B" Index for coarse grade cottons. The United States and USSR are relevant comparisons because the former is often the leading cotton exporter, while the latter holds approximately the same share of the world market as Pakistan. The B Index is a composite index of a bundle of cotton exports (including Pakistan's) of the same general quality as Pakistan's.

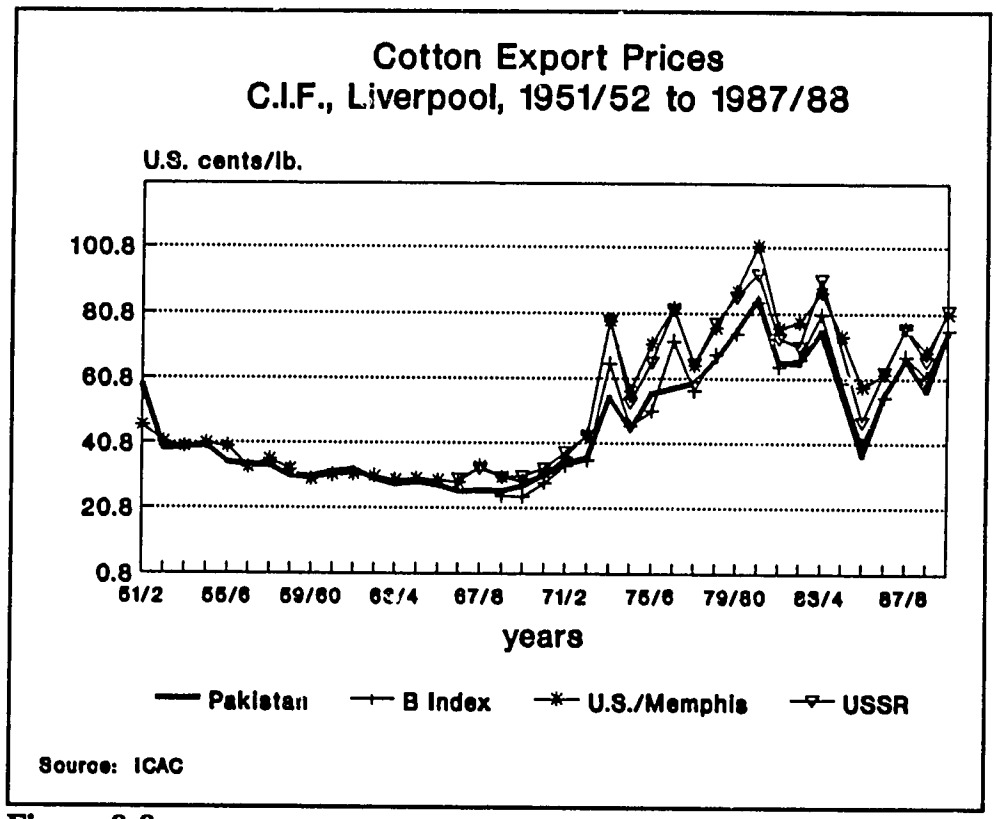


Figure 8.8

Two features of the world cotton market emerge immediately from Figure 8.8. The first is the high degree of market integration: the prices of different quality exports from around the world move quite closely together. The second observation is the striking difference in the volatility of world cotton prices before and after 1971/72. Exporters in the pre-1971/72 period could be relatively certain that the price they would receive in a given year would be close to the price they received in the previous year; after 1971/72, there could be no such certainty.

The coefficient of variation in the world price of Pakistani cotton exports from 1952/53 to 1971/72 was 0.13; since then this measure of variability has been 0.21 -- a 62 percent increase. During the earlier period, the nominal world price of Pakistani cotton fell by an average of 1.7 percent per year; since 1971/72 there has been no significant trend, though the average price for the later period is nearly twice that of the earlier period. Moreover, greater distance between the prices of the various grades and sources of cotton exports also characterizes the increased volatility of the later period.

Several structural changes in the international cotton market explain this dramatic pattern.[99] The most important factor underlying the increased variability of world cotton prices after 1972 was a change in U.S. agricultural policy. Prior to 1972, the United States maintained large stocks of cotton as a means of stabilizing prices. Since the United States accounted for 40 to 50 percent of the world cotton trade, this meant that the entire world market was stabilized. In 1972, President Nixon discontinued the policy of carrying large stocks of cotton. This resulted in the transfer back to world markets of the variability that had been absorbed by U.S. stocks.

Another factor contributing to the increased instability in world cotton markets was the entry of China into international cotton trade. Prior to 1979, China refrained from importing cotton. Yet, between 1979 and 1981, China bought 25 percent of total world cotton exports. From 1984 to 1987, China exported 20 percent of the total world cotton trade. Then, in 1988, China imported cotton. Each of these changes caught the market by surprise, and contributed to price instability.

The increase in average cotton prices post-1972 is largely explained by the course of world inflation, which increased from 1 percent to 4 percent per year over this period.

8.5.2 Yarn Export Price

Figure 8.9 illustrates trends in the export price of yarn since 1971/72. Yarn quality is measured by its "count", which is a measure of its fineness. Figure 8.9 demonstrates the extent to which international yarn markets use price to distinguish between increasingly fine counts of yarn by comparing the price for 10 count, 20, count, and 40 count yarns. Although the prices for various counts vary together, there is a consistent margin between them. The prices for the coarse and medium yarns (10 and 20 count, respectively) have tended to be quite close over the period shown, with 20 count yarn prices on average only one percent greater than 10 count yarn prices. Yet, average price for 40 count (fine) yarn since 1971/72 have been fully 60 percent greater than the average price of 20 count yarn, indicating a significant quality premium.

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[99] The analysis in the following three paragraphs is based on an interview with Terry Townsend, International Cotton Advisory Committee, August 30, 1991.

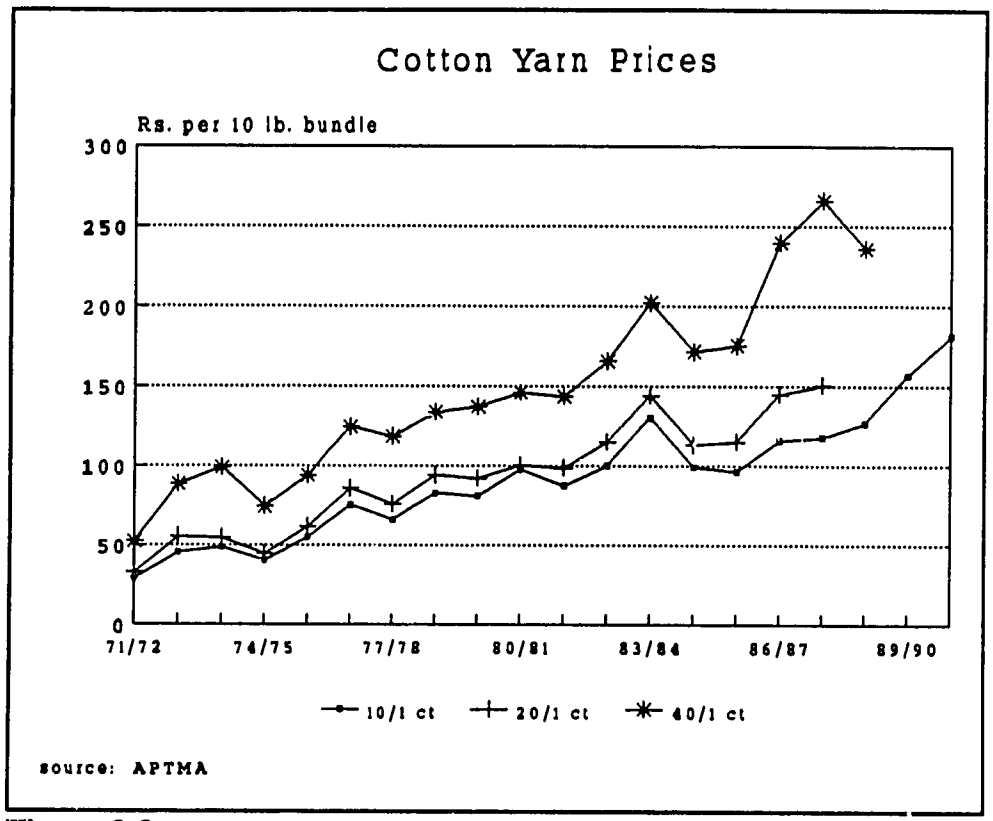

Figure 8.9
Note: prices at Karachi

Pakistan has developed a reputation as being a large-scale supplier of relatively poor quality (course) yarn. Between 1984/85 and 1990/91, coarse count cotton accounted for an average of 37 percent of total Pakistani yarn production, while medium count yarns accounted for 45 percent and fine counts for less than 4 percent (the rest being divided between super fine, mixed, and man-made yarns).[100]

Production figures for this period reflect a nearly perfect negative correlation between coarse and medium yarn output, suggesting a direct trade-off between the two. Yet, the fact that their export prices are so close means that this choice makes relatively little difference with regard to yarn export earnings.

8.5.3 Cloth Export Prices

Figure 8.10 illustrates recent trends in cloth export prices. In contrast to yarn export prices, which rose fairly steadily, cloth export prices varied narrowly around no trend during the 1980s.

[100] APTMA (1991), p. 47

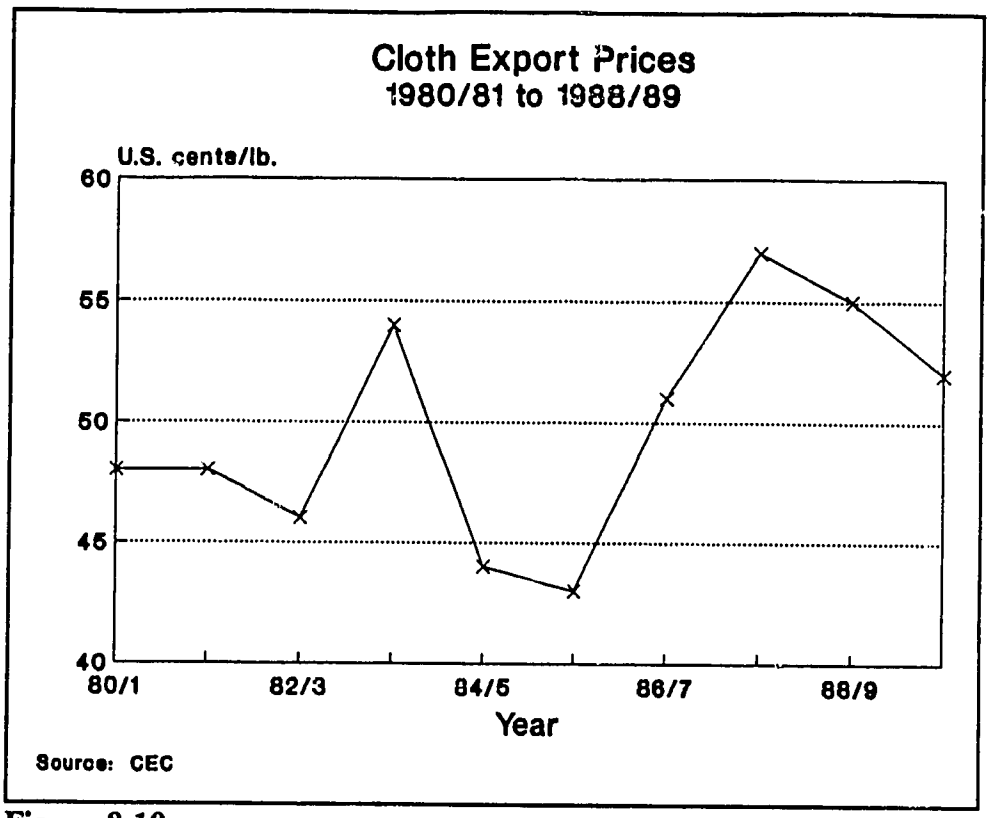

Figure 8.10

8.6 Cotton Sector Export Earnings

This section traces the evolution of cotton sector export earnings, first looking separately at each of the three major categories of cotton exports: raw cotton, yarn, and cloth. Figure 8.11 illustrates the trend in earnings from raw cotton exports, both in nominal terms and in real terms, deflated by the general wholesale price index for Pakistan (1975/76 = 100). Nominal earnings from raw cotton exports have increased from the mid- 2 million rupee range in the early 1970s to a level of over Rs. 6.5 billion in the late 1980s. In real terms (that is, accounting for inflation), the average annual increase in earnings from raw cotton exports was 8.9 percent.

Yarn and cloth exports earnings performed quite similarly to cotton earnings. Figure 8.11 shows the similar trends for yarn export earnings. The average annual growth rate of real export earnings from yarn was 6 percent over the period from 1969/70 to 1987/88. Figure 8.11 illustrates that the level and growth of cloth export earnings was quite similar to that of raw cotton and yarn. Like raw cotton and yarn exports, nominal cloth export earnings began the period in the mid-2 million rupee range, and grew to a level of over Rs. 6.5 billion. The average annual growth rate of *real* export earnings from cloth was 6.8 percent per year over this period.

Total export earnings from the cotton sector (the sum of raw cotton, yarn, and cloth exports) are shown in Figure 8.12. Beginning the period at just under Rs. 2 billion, total nominal cotton sector export earnings increased ten-fold by 1987/88, to Rs. 20 billion. As Figure 8.12 shows, this growth is less dramatic when subtracting out inflation; yet, the average annual growth rate for total sector exports in real terms was still 7.0 percent.

Figures 8.11 through 8.13 reflect the fact that the division of export earnings was fairly even between raw cotton, yarn, and cloth. Over the period from 1969/70 to 1987/88 the average share of raw cotton in cotton sector exports was 31 percent. Over the same period, yarn export earnings accounted for an average of 34 percent; and cloth exports earned 35 percent of total sector export revenues on average. Figure 8.14 shows that total cotton sector foreign exchange earnings (e.g. the sum of earnings from raw cotton, yarn, and cloth), while Figure 8.15 illustrates the relative shares of raw cotton, yarn, and cloth in the totals shown in Figure 8.14.

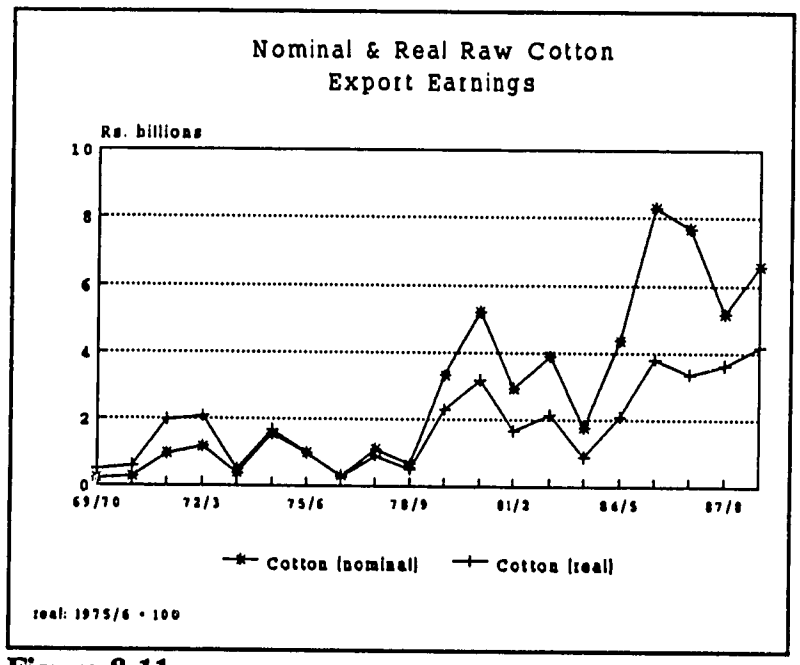

Figure 8.11
Source: Economic Yearbook of Pakistan

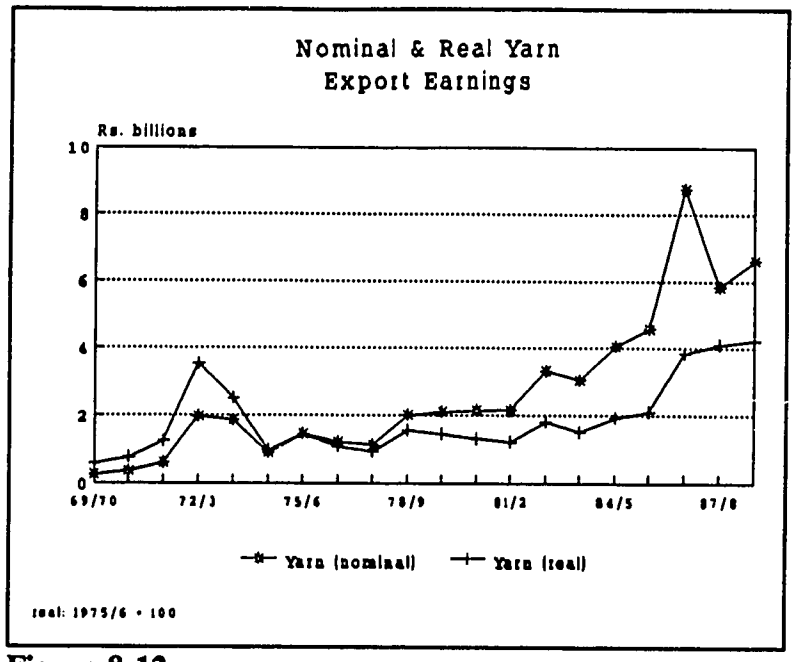

Figure 8.12
Source: Economic Yearbook of Pakistan

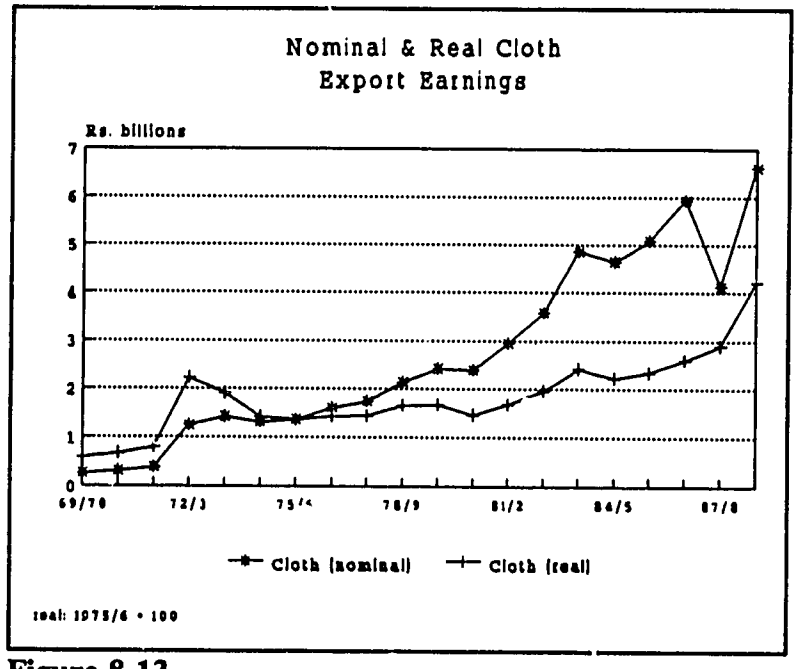

Figure 8.13
Source: Economic Yearbook of Pakistan

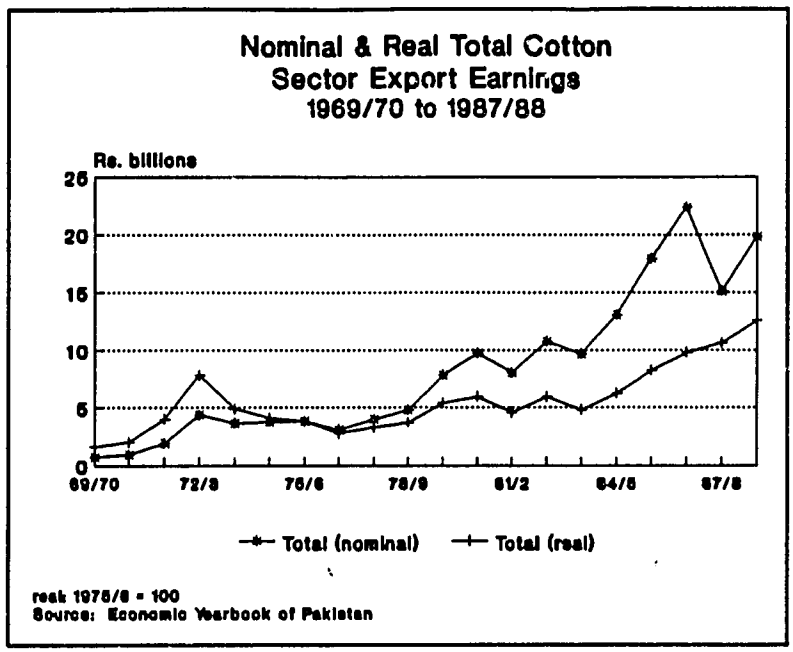

Figure 8.14

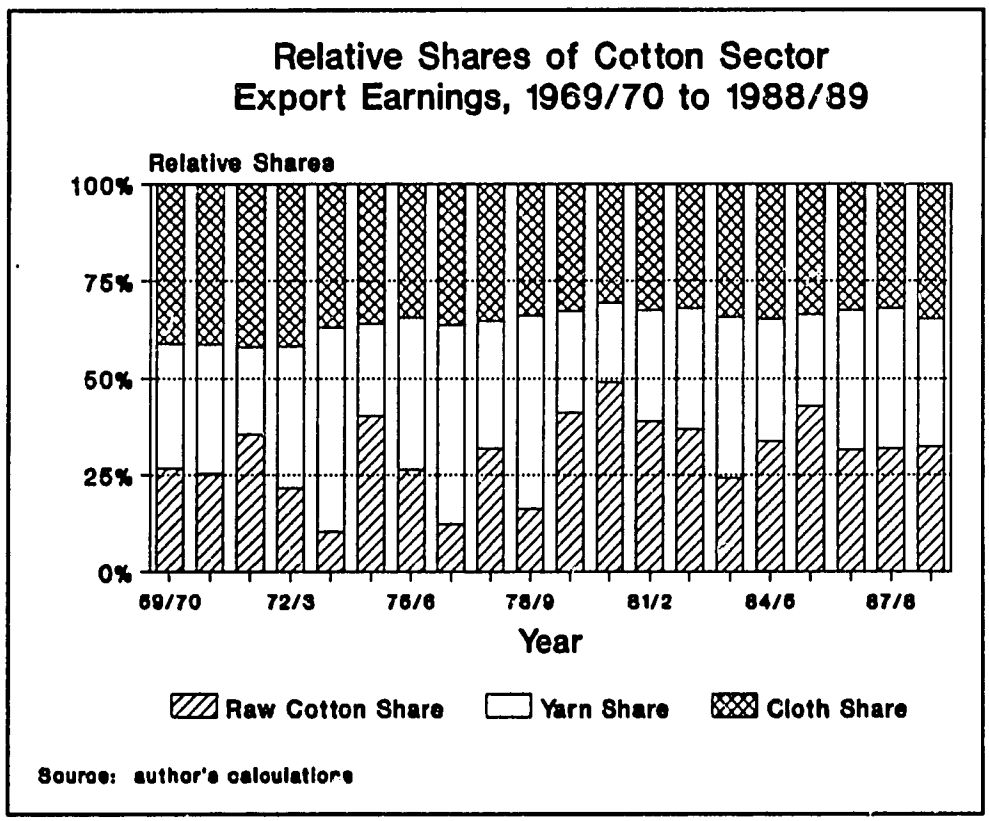

Figure 8.15

The historical importance of cotton sector exports to the Pakistani economy is well illustrated by Figure 8.16, which shows total cotton sector exports as a share of total Pakistani exports. Cotton and cotton textiles (yarn and cloth) accounted for an average of 36 percent of total Pakistani exports from 1969/70 to 1987/88. In 1971/72, a peak year for all cotton sector exports, sector exports accounted for nearly 60 percent of Pakistan's total export earnings.

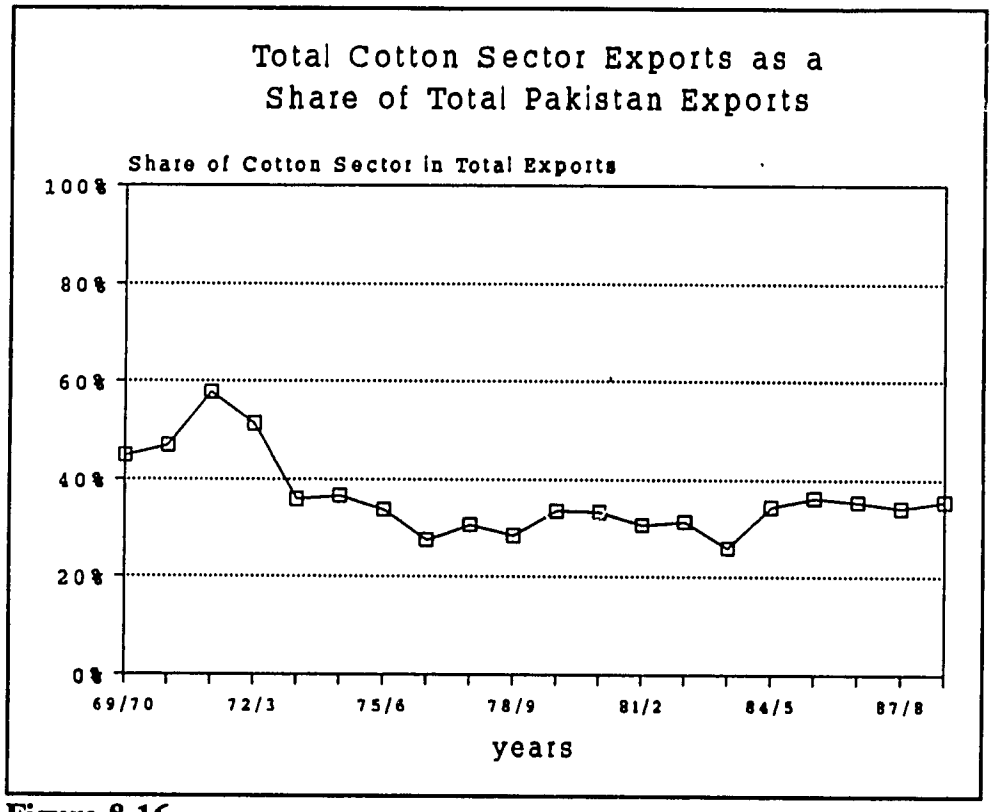

Figure 8.16
Source: author's calculations

9. THE ROLE OF VARIETIES, RESEARCH, AND INPUTS IN COTTON PRODUCTION

This chapter provides a brief overview of the different cotton varieties grown in Pakistan, as well as historical background on varietal research and trends in input use on cotton.

9.1 Characteristics of Pakistani Cotton

Cotton varieties differ significantly from one another along a range of criteria, including yield per acre, disease resistance, heat and salt tolerance, ginning percentage, and a variety of technical measures of fiber quality. These technical measures include: staple length, micronaire value, and Pressley strength. Staple length refers to the length (usually in inches) of the cotton fiber; micronaire is a composite measure of the fineness and maturity of the fibers; and, Pressley strength measures the maximum tensile strength of the lint at the time of rupture.

Table 9.1 summarizes the characteristics of the main varieties currently cultivated in Pakistan. Trends in these various characteristics provide some insight into the patterns of adoption of new varieties. Various segments of the cotton sector are particularly concerned about specific characteristics of the cotton. Ginners, for example, prefer varieties with the highest ginning percentage (i.e., the percentage of lint separated from a given weight of seed cotton). Table 9.1 shows a general trend toward increased ginning percentages as new varieties are released. Spinners, on the other hand, may be more concerned with staple length, since longer staple fibers are easier to spin. The same is true for fiber strength.

In principle, the seed cotton market should reflect the quality distinctions by price. Indeed, econometric evidence exists to support the notion that international cotton markets make clear price distinctions for fibers of different staple length.[101] In practice, anecdotal evidence suggests that rural cotton markets in Pakistan do not operate that efficiently. In general, farmers do not seem to be rewarded for producing higher quality cotton.[102]

Thus, farmers' adoption decisions rely largely on yield (which, in the absence of quality premiums, is the primary factor determining profitability). More precisely, adoption decisions depend on farmers' perceptions of yield differences *on their farms*.[103] In fact, yields vary widely as a function of local land and climactic conditions, agronomic practices,

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[101] Monke & Petzel (1983)

[102] Interview with Siddique Bukhari, cotton farmer, Multan, July 3, 1991.

[103] Interview with Abdus Salam Chaudhry, Head of Breeding Section, Cotton Research Institute, Multan, July 4, 1991.

practices, quality of farm management, and so on. Current yields on traditional farms in the Punjab may be on the order of 15 maunds per acre, while the most progressive farmers in that region attain 25 to 30 maunds per acre.[104]

Table 9.1 also shows a greater variety of recent seeds released for the Punjab than for Sind. As argued in Chapter Six, however, this does not appear to explain the dramatic surge in cotton yields in Punjab and decline in Sind.

Table 9.1 Characteristics of Cotton Varieties in Pakistan

Variety	Year of Release	Ginning Percentage	Staple Length	Micronaire Value	Pressley Strength
			inches		1,000 lbs/sq.inch
Punjab:					
B-557	1975	34.5%	1-1/32	4.5	92.9
MNH-93	1980	36.5%	1-1/16	4.7	94.0
NIAB-78	1983	36.6%	1-1/32,1-1/16	4.6	92.5
MS-84	1983	34.0%	1-1/4	3.9	91.3
SLH-41	1984	34.0%	1-1/32	4.4	95.8
CIM-70	1986	31.2%	1-5/32	4.2	92.5
MNH-129	1986	38.5%	1-1/16	4.4	95.4
Sind:					
M-100	1963	34.0%	1-1/32,1-1/16	3.5-4.0	85.0
H-59-1	1974	34.0%	1-1/8	3.5-3.7	90.0
S-59-1	1975	34.0%	1-1/8	3.5-3.7	92.7
K-68/9	1977	30.0%	1-3/16	4.3	96.1
TH-1101	1985	35.0%	1-1/16	4.0-4.4	89.0-90.0

Source: Ender (1990), p. 7, Table 3

[104] Interview with Siddique Bukhari, op.cit.

Figure 9.1 shows recent trends in the share of cotton acreage planted to each of the major varieties of cotton.

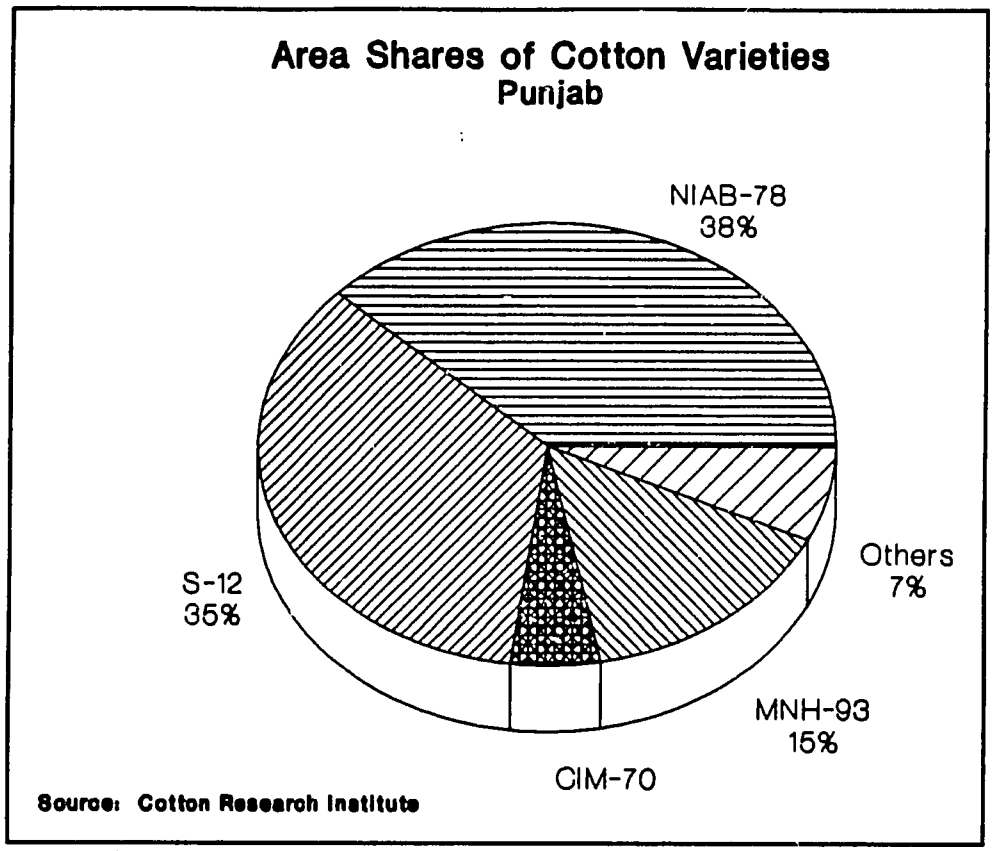

Figure 9.1

9.2 Historical Overview of Varietal Research on Cotton[105]

Generation of the different cotton varieties described above was the result of long-term varietal research on cotton in Pakistan. From 1907 to 1946, for instance, yield increases for agriculture in general were 12 percent on irrigated land and 3 percent on unirrigated (barani) land. Over the same period, changes in cropping patterns toward more valuable crops increased the value of output by 5 percent. Most of this change was due to the introduction of longer-staple cotton varieties.[106] In total, 20 percent of the increase in the value of agricultural output during the British period can be attributed to new technology (via increased yield and changed cropping patterns).[107] In the post-independence period,

[105] This section relies heavily on Pray (1981).

[106] Pray (1981), Table 1

[107] Pray (1981)

new varieties are estimated to have accounted for under one-third of the 100 percent increase in the value of all agricultural output.

The center for plant research in Pakistan was originally the Punjab Department of Agriculture (PDA), established in 1905. Research efforts at the PDA concentrated on cotton and wheat. Between 1910 and 1986, approximately thirty-three new cotton varieties were released for cultivation. Of these, all but five were for American (e.g. Upland) varieties. American cotton was introduced to Pakistan in 1913, after which it quickly displaced the shorter staple local (desi) cotton. By 1942/43, 70 percent of American and 20 percent of desi cotton was planted under improved varieties. Figure 9.2 shows the relative acreage planted to desi and American cottons over time; Figure 9.3 compares the varieties in terms of shares of production.

By the early 1920s, American cotton covered about 40 percent of the country's cotton lands (and 90 percent of perennially irrigated cotton land). The second period of rapid spread was during the 1940s, when relative prices shifted in favor of American varieties.[108] Figure 9.2 shows that by independence, American cotton had spread to 84 percent of total cotton acreage, and had all but eliminated desi cotton (except on some rainfed areas) by 1986/87. Figure 9.3 shows a virtually identical pattern for cotton production shares by variety.

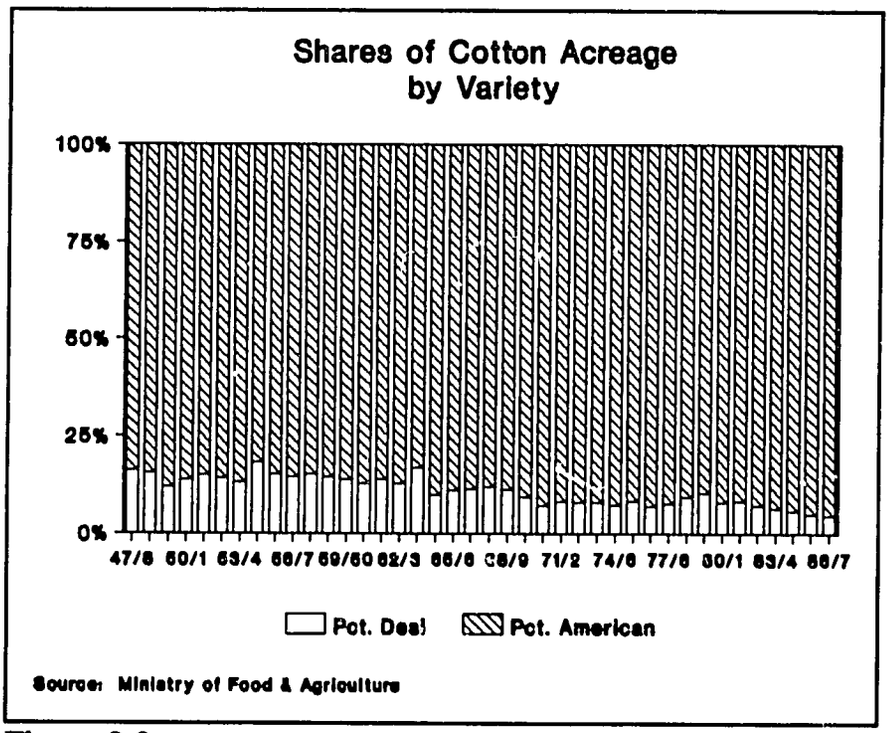

Figure 9.2

[108] Ibid., p. 10

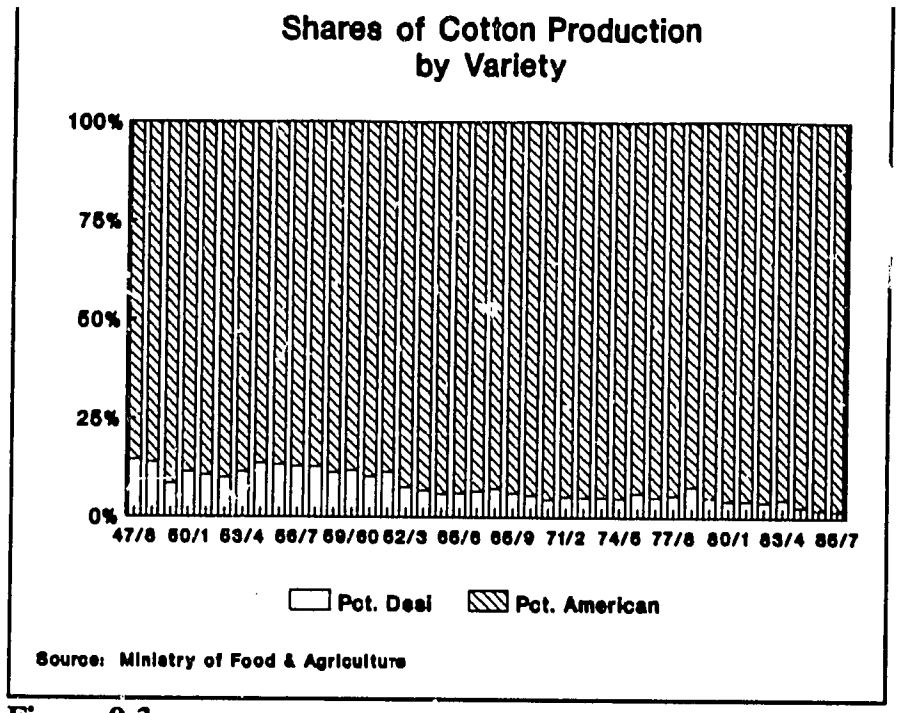

Figure 9.3

The basic economic issues regarding agricultural research pertain to the size of the research budget, the allocation of that budget among alternative crops, the distribution of the benefits of that research, and the source of the demand for research.

One analysis has estimated that the internal rate of return to agricultural research under British rule ranged form 36 to 44 percent, while estimates for the post-independence period was approximately 35 percent.[109] This provides a gauge with which to measure the economic efficiency of budget allocations vis-a-vis agricultural research. Based on this type of analysis, Pray found that the British underinvested in agricultural research, and that the post-independence governments of Pakistan did not greatly improve the efficiency of research allocations.[110]

In general, Pray also found that producers of the highly researched crops were the primary beneficiaries of the research; yet cotton may have been the exception. He suggests that the pre-independence benefits of cotton research may have been passed on to consumers (e.g. cotton mills) in the form of cheaper cloth. It is also relevant to note that cotton alone

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[109] Pray (1981). An "internal rate of return" is the interest rate at which an investment has a net present value = 0. A typical investment rule would be to undertake investments for which the opportunity cost of capital is less than the IRR.

[110] Pray (1981), p. 13

financed its own research. Starting in the 1920s, cotton research was financed by a tax on pressed cotton, which continued after independence.

The allocation of research resources in Pakistan among crops clearly reflected the desirability of cash crops as research investments. In fact, the initial decision of the agricultural research establishment to concentrate on cotton and wheat varieties was a political decision made by the British administration at the all-India level. This decision was an expression of the economic need of Britain. For instance, in 1904/05, Britain imported more wheat from India than any other country. There is also clear evidence that British cotton interests played a significant role in shaping the original research priorities of the Punjab Department of Agriculture. By the late 1920s, research on other crops had begun, but wheat and cotton continued to dominate the research agenda. Indeed, the dominance of wheat and cotton continued unchecked after independence. For cotton, this priority is explained by the existence of an independent funding source, as well as the new government's interest in cotton exports.

The primacy of cotton in commodity research was reinforced by the establishment in 1921 of the Indian Central Cotton Committee. The ICCC became responsible for funding cotton research with funds raised through the cotton cess. Its mission was continued after independence by the Pakistan Central Cotton Committee (PCCC).

One measure of the appropriateness of inter-commodity resource allocation is a comparison of the share of a given crop in the total value of agricultural output with its share of research resources. Table 9.2 summarizes this comparison for foodgrains, cash crops, and cotton as a percentage of all agriculture. Table 9.2 confirms that independence made little difference to the historical trend to over-emphasize cash crops in general and cotton in particular relative to their share in the value of total output. Table 9.2 also demonstrates that inter-commodity research budget allocations became more efficient during the 1960s. By 1971, the overemphasis on cash crops had been minimized, and had been reversed for cotton.

Table 9.2 Value of Crop and Resource Distribution

	1929		1960		1971	
	% val.	% SMY	% val.	% SMY	% val.	% SMY
Total Food & Pulses	72	56	68	35	58	53
Cotton	23	29	14	17	26	16
Total Cash Crops	28	43	32	64	42	47

SMY = scientific man-year
Source: Pray (1981), Table 8

The underinvestment in agricultural research in general, and the overinvestment in cash crops (relative to their value in total output) reflects the sources of demand for that research. During the colonial period, as noted above, British cotton interests played a clear role in shaping the research priorities of the Punjab Department of Agriculture. In 1904/05, the Lancashire cotton industry directly communicated to the King of England their desire to be independent of U.S. cotton, and to promote the production of long-staple cotton in India. This directive was thus communicated directly from the King to the Indian administration. Cotton was somewhat unique in having an indigenous lobbying group -- the ICCC, and later the PCCC -- which shared the British interest in promoting cotton research. Thus, the initial demand for agricultural research came from the central government and specific interest groups.

Regarding research budgets, Pray describes a general trend toward increased spending on research in the post-independence period, yet a reduced demand for research. The fiscally conservative colonial government spent parsimoniously on agricultural research. Following independence, with the onset of large foreign aid flows, development spending increased, and the research budget along with it. Yet, research received a declining portion of the agricultural budget after independence. Pray suggests that the reduced demand for research resulted from higher expected returns to investments in extension, mechanization and irrigation, and fertilizer.[111] Cotton may be a moderate exception to this generalization, in part since cotton research was the only category that continued to yield a stream of new varieties during the first decades of independence.

In recent decades, the Pakistani agricultural research establishment has suffered some setbacks. The 1970s in particular were a period of demoralization when the Government took the view that Pakistan could import agricultural technology from abroad and could thus afford to reduce its indigenous efforts.

9.3 Trends in Purchased Input Use on Cotton

The primary purchased inputs used in cotton production are pesticides, fertilizer, and water.[112] Among these three inputs, the growth in pesticide application is most unique to cotton (that is, the pattern for fertilizer and water use is more generalizable to other crops). Approximately 80 percent of total pesticide use is directed to cotton.[113] Figure 9.4 shows the rapid growth of pesticide use in the 1980s, during which time the quantity of pesticide used on cotton increased over five-fold. This increase was fueled by the traumatic experience of the cotton failure of 1983, which was due in large part to pest infestation. Farmers who had protected their cotton crop benefitted greatly by the high prices that year.

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[111] Ibid., p. 38

[112] Trends in land input were discussed in Chapter Six; no data exists specifically on total labor use in cotton.

[113] Agricultural Statistics of Pakistan, 1988-89

The demonstration effect motivated the rapid spread of plant protection measures, at least in Punjab.[114]

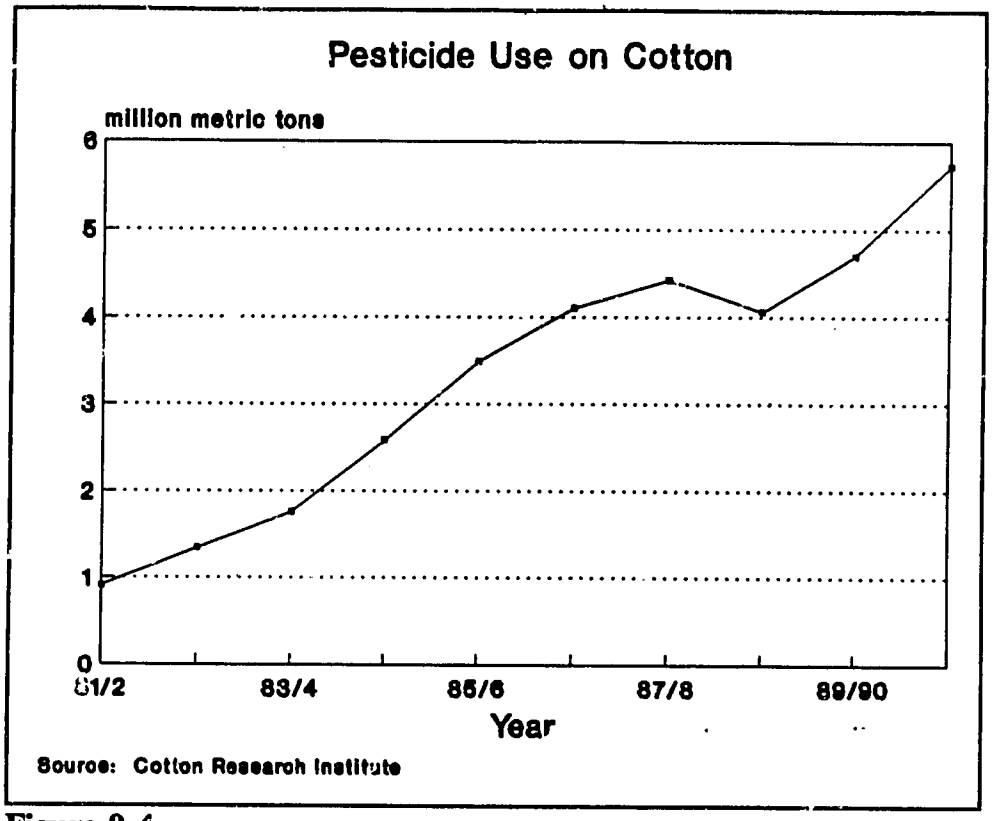

Figure 9.4

Fertilizer use on cotton also increased rapidly since 1960/61. Figure 9.5 traces the rise in nitrogen applications on cotton. From 1965/66 to 1985/86, nitrogen application to cotton increased by 13 percent per year.

Water use also increased dramatically as a result of widespread investment in tubewell irrigation during the 1970s. Figure 9.6 illustrates the trend in water use on cotton since 1965/66. From 1965/66 to 1985/86, water use on cotton grew by an average annual rate of 2.4 percent.

[114] Interview with Dr. Zahoor Ahmad, Director, Cotton Research Institute, Multan, July 3, 1991.

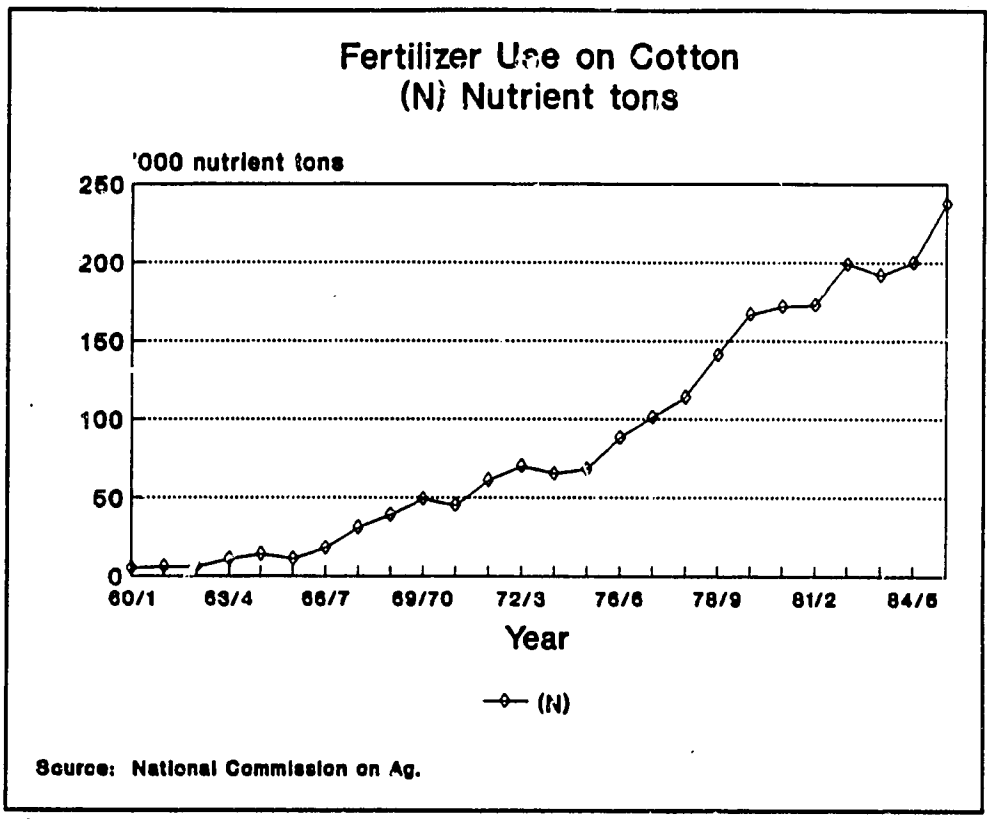

Figure 9.5

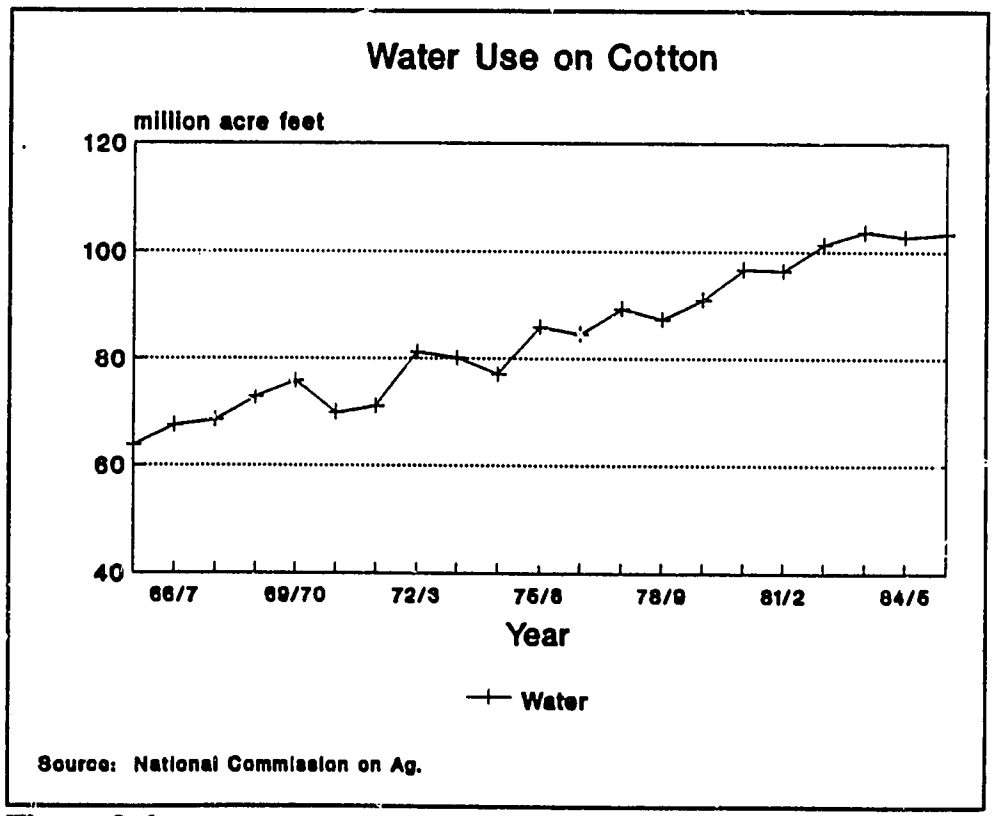

Figure 9.6

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APPENDIX A: LIST OF PERSONS CONTACTED

Abt Associates, Inc

Dr. Gary Ender (USAID/Islamabad)

Food Research Institute, Stanford University

Prof. Walter Falcon
Prof. Carl Gotsch

USDA

Dr. Rip Landes, Economic Research Service
Bill Brandt, Division of Cotton, Tobacco and Firearms
Robin Tilsworth-Rude, Agricultural Attache, Islamabad

All Pakstian Textile Mills Association

S.M. Usman, Secretary General

Applied Economics Research Center, University of Karachi

Akhtar A. Hai, Research Economist
Syed A. Husaini Jagirdar, Research Economist/Agronomist
Dr. Hafiz A. Pasha, Director

Cotton Board, Govt. of Pakistan

Dr. M. Usman, Deputy Secretary

Pakistan Cotton Ginners Association

Khawaja Muhammad Ilyas, Vice Chairman
Khawaja M. Farooq
Khawaja A. Bashir

Pakistan Central Cotton Committee

Iftchar Afzal, Vice-President
Dr. Zahoor Ahmad Baluch, Deputy Director (Research)

Textile Commissioner Organization, Ministry of Indusries, Govt. of Pakistan

G.N. Khan, Textile Commissioner
Mohammam Idress Ahmed, Director

Karachi Cotton Association

Fasihuddin, Secretary

Cotton Export Corporation

Ghazanfar Ali Khan, Commercial Director

Central Cotton Research Institute, Multan

Dr. Zahoor Ahmad, Director
Mohammad Tanveer, Head, Transfer of Technology Section
Abdus Salam Chaudhry, Head, Breeding and Genetics Section

Private Cotton Exporters and International Traders

Murtaza A. Siddiqui, BUNGE, Liaison Office, Karachi

Zafar Hassan, Managing Partner, Omnitrade Enterprises, Karachi
Humayun Zafar, Partner, Omnitrade Enterprises, Karachi

Hans Gassmann, Director Cotton Division, Volkart Pakistan Ltd., Karachi

Furrokh H. Wania, General Manager, Cotton Div., Volkart Ltd.
R.K. Fazli, Dy. General Manager, Cotton Division, Volkart Ltd.

Private Cotton Farmer and Ginner

M. Siddiq Akbar Bokhari, Managing Director, AL-Seemi Agricultural Services & Ginning Company Ltd.

Ministry of Commerce, Govt. of Pakistan

M. A. Bajwa

International Cotton Advisory Committee

Terry Townsend

World Bank

Har Bhattacharya

STATISTICAL APPENDIX

COTTON ACREAGE BY PROVINCE, PAKISTAN
1947/48 to 1988/89
('000 ha)

YEAR	PUNJAB	SIND	OTHER	TOTAL
1947/48	898	337	2	1237
1948/49	743	306	2	1052
1949/50	472	353	2	1111
1950/51	854	364	3	1221
1951/52	960	377	6	1343
1952/53	960	420	6	1385
1953/54	774	384	4	1162
1954/55	883	382	4	1270
1955/56	979	424	4	1408
1956/57	983	451	5	1439
1957/58	1007	443	4	1453
1958/59	907	414	4	1325
1959/60	930	408	5	1343
1960/61	879	411	3	1294
1961/62	972	421	3	1396
1962/63	974	398	3	1374
1963/64	1062	407	3	1471
1964/65	1128	337	3	1467
1965/66	1162	397	3	1562
1966/67	1200	418	3	1621
1967/68	1333	45	3	1786
1968/69	1309	436	2	1746
1969/70	1345	409	2	1756
1970/71	1309	423	2	1734
1971/72	1497	460	2	1958
1972/73	1579	429	2	2011
1973/74	1370	472	4	1846
1974/75	1547	481	3	2032
1975/76	1385	465	2	1852
1976/77	1331	532	3	1866
1977/78	1305	536	3	1844
1978/79	1388	501	2	1891
1979/80	1482	598	2	2082
1980/81	1507	599	3	2109
1981/82	1574	638	4	2168
1982/83	1613	647	3	2264
1983/84	1563	655	3	2222
1984/85	1568	671	3	2243
1985/86	1747	615	3	2365
1986/87	1865	638	3	2506
1987/88	1937	625	0	2562
1988/89	1806	615	0	2562

Source: Ministry of Agriculture, c.f. APCOM (1990)

COTTON ACREAGE BY VARIETY, PAKISTAN
1947/48 to 1989/90
('000 Ha)

YEAR	Desi	pct.	American	pct.	TOTAL
1947/48	200.3	16%	1036.4	84%	1236.7
1948/49	162.7	15%	888.7	85%	1051.4
1949/50	131.5	12%	979.0	88%	1110.5
1950/51	168.4	14%	1052.2	86%	1220.6
1951/52	200.3	15%	1142.5	85%	1342.8
1952/53	194.7	14%	1190.2	86%	1384.9
1953/54	152.2	13%	1009.3	87%	1161.5
1954/55	230.3	18%	1038.9	82%	1269.1
1955/56	213.3	15%	1193.8	85%	1407.1
1956/57	207.6	14%	1231.1	86%	1438.7
1957/58	219.7	15%	1233.1	85%	1452.9
1958/59	192.6	15%	1131.9	85%	1324.6
1959/60	184.9	14%	1157.8	86%	1342.8
1960/61	164.3	13%	1128.7	87%	1293.0
1961/62	192.6	14%	1203.2	86%	1395.8
1962/63	175.6	13%	1198.3	87%	1373.9
1963/64	178.5	17%	887.5	83%	1066.0
1964/65	144.1	10%	1322.5	90%	1466.6
1965/66	172.0	11%	1389.3	89%	1561.3
1966/67	183.3	11%	1436.7	89%	1620.0
1967/68	212.5	12%	1572.6	88%	1785.1
1968/69	196.3	11%	1549.2	89%	1745.4
1969/70	163.5	9%	1592.1	91%	1755.6
1970/71	122.6	7%	1610.7	93%	1733.3
1971/72	159.9	8%	1797.7	92%	1957.5
1972/73	161.1	8%	1849.0	92%	2010.1
1973/74	145.3	8%	1699.7	92%	1845.0
1974/75	146.5	7%	1884.7	93%	2031.2
1975/76	155.0	8%	1696.5	92%	1851.5
1976/77	128.3	7%	1736.5	93%	1864.8
1977/78	140.8	8%	1702.1	92%	1843.0
1978/79	174.8	9%	1715.9	91%	1890.7
1979/80	214.9	10%	1866.0	90%	2080.9
1980/81	167.9	8%	1940.1	92%	2108.1
1981/82	178.9	8%	1988.3	92%	2167.1
1982/83	161.9	7%	2100.8	93%	2262.6
1983/84	142.9	6%	2078.1	94%	2221.0
1984/85	127.9	6%	2114.1	94%	2242.0
1985/86	117.4	5%	2246.5	95%	2363.8
1986/87	113.7	5%	2387.7	95%	2501.4
1987/88	104.8	4%	2463.0	96%	2567.8
1988/89	100.0	4%	2519.6	96%	2619.6
1989/90	86.2	3%	2532.2	97%	2618.4

Source: Ministry of Food & Agriculture, Govt. of Pakistan

COTTON YIELDS IN WORLD AND SELECTED COUNTRIES
1947/48 to 1989/90
(kg. lint/ha)

YEAR	PAKISTAN	INDIA	EGYPT	U.S.	WORLD
1947/48	142	118	---	---	205
1948/49	149	79	---	---	226
1949/50	177	[illegible]	---	---	222
1950/51	183	92	---	---	208
1951/52	165	95	---	---	209
1952/53	204	92	---	---	220
1953/54	195	105	---	---	242
1954/55	198	114	---	---	238
1955/56	189	93	---	---	249
1956/57	189	101	---	---	245
1957/58	187	106	---	---	252
1958/59	190	102	---	---	275
1959/60	194	86	---	---	284
1960/61	208	118	---	---	280
1961/62	207	95	---	---	266
1962/63	238	118	---	---	286
1963/64	254	120	---	---	296
1964/65	230	110	665	517	309
1965/66	237	108	582	527	322
1966/67	255	103	520	480	313
1967/68	259	119	570	447	313
1968/69	270	124	633	516	336
1969/70	272	121	709	435	312
1970/71	279	113	664	438	331
1971/72	322	145	710	438	351
1972/73	312	135	703	507	361
1973/74	318	141	650	520	376
1974/75	279	152	640	441	376
1975/76	248	141	603	453	352
1976/77	208	139	675	465	352
1977/78	278	137	595	520	353
1978/79	224	148	783	420	340
1979/80	312	150	859	547	379
1980/81	302	155	903	404	371
1981/82	301	158	900	542	396
1982/83	325	160	917	590	397
1983/84	199	148	871	508	400
1984/85	401	209	862	600	487
1985/86	459	232	855	630	477
1986/87	470	204	806	552	466
1987/88	510	178	821	706	484
1988/89	500	215	881	616	491
1989/90	510	220	852	640	498

Source: ICAC, Cotton - World Statistics

COTTON YIELD BY PROVINCE, PAKISTAN
1947/48 to 1989/90
(kg. lint/ha)

YEAR	PUNJAB	SIND	NWFP	BALUCH	TOTAL
1947/48	148	194	221		157
1948/49	157	184	74		166
1949/50	203	184	92		194
1950/51	194	240	65		203
1951/52	175	203	148		184
1952/53	221	249	184		231
1953/54	194	267	120		212
1954/55	203	258	92		221
1955/56	203	221	129		212
1956/57	203	221	92		212
1957/58	203	231	101		212
1958/59	203	249	101		212
1959/60	212	221	101		212
1960/61	231	240	120		231
1961/62	240	221	157		231
1962/63	277	249	166		267
1963/64	295	258	148		286
1964/65	267	240	148		258
1965/66	240	332	175		267
1966/67	277	304	184		286
1967/68	286	295	194		286
1968/69	295	323	184		304
1969/70	304	332	184		304
1970/71	304	341	194		314
1971/72	315	345	171		362
1972/73	284	414	179	305	312
1973/74	292	394	186	294	318
1974/75	254	358	181	173	279
1975/76	222	324	180	261	248
1976/77	186	264	185	52	208
1977/78	246	357	178	159	278
1978/79	212	254	159		223
1979/80	290	368	179		312
1980/81	281	357	185	303	302
1981/82	274	369	184	303	302
1982/83	306	371	186	273	325
1983/84	164	280	182	379	199
1984/85	483	374	190	342	450
1985/86	555	400	191	303	515
1986/87	589	348	193	282	527
1987/88	637	371			572
1988/89	602	334			544
1989/90	622	332			559

Source: Ministry of Agriculture, and PCCC

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COTTON PRODUCTION BY PROVINCE, PAKISTAN
1947/48 to 1989/90
'000 bales (375 lbs.)

YEAR	PUNJAB	SIND	NWFP	BALUCH.	TOTAL
1947/48	735	368	3		1,106
1948/49	642	321	1		964
1949/50	875	363	1		1,239
1950/51	909	496	1		1,406
1951/52	957	435	5		1,397
1952/53	1,194	585	5		1,784
1953/54	847	575	3		1,425
1954/55	1,028	553	2		1,583
1955/56	1,120	555	3		1,678
1956/57	1,137	572	2		1,711
1957/58	1,130	576	2		1,708
1958/59	1,015	570	2		1,587
1959/60	1,126	510	3		1,639
1960/61	1,124	565	2		1,692
1961/62	1,298	522	3		1,822
1962/63	1,495	562	3		2,060
1963/64	1,753	599	2		2,354
1964/65	1,676	446	2		2,124
1965/66	1,593	735	3		2,331
1966/67	1,894	708	3		2,606
1967/68	2,167	741	4		2,911
1968/69	21,734	791	3		2,967
1969/70	2,244	766	3		3,012
1970/71	2,229	819	2		3,051
1971/72	2,967	1,000	2		3,969
1972/73	2,826	1,118	3		3,947
1973/74	2,525	1,175	4		3,704
1974/75	2,476	1,087	3		3,567
1975/76	1,937	949	3		2,889
1976/77	1,557	885	3		2,446
1977/78	2,022	1,208	3		3,233
1978/79	1,858	802	2		2,662
1979/80	2,831	1,448	3		4,282
1980/81	2,789	1,407	3	2	4,201
1981/82	2,845	1,550	3	2	4,400
1982/83	3,255	1,585	3	1	4,844
1983/84	1,694	1,210	3	1	2,908
1984/85	4,450	1,476	3	1	5,930
1985/86	5,701	1,449	3	1	7,154
1986/87	6,451	1,305	3	1	7,760
1987/88	7,255	1,374	3	1	8,633
1988/89	7,275	1,108	2	1	8,386
1989/90	7,454	1,095	1	1	8,551

Source: Ministry of Agriculture

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COTTON PRODUCTION BY VARIETY, PAKISTAN
1947/48 to 1989/90
('000 Bales)

YEAR	Desi	pct.	Staple	pct.	TOTAL
1947/48	159	14.4%	947	85.6%	1,106
1948/49	132	13.7%	832	86.3%	964
1949/50	104	8.4%	1,135	91.6%	1,239
1950/51	160	11.4%	1,246	88.6%	1,406
1951/52	148	10.6%	1,249	89.4%	1,397
1952/53	175	9.8%	1,609	90.2%	1,784
1953/54	161	11.3%	1,264	88.7%	1,425
1954/55	215	13.6%	1,368	86.4%	1,583
1955/56	222	13.2%	1,456	86.8%	1,678
1956/57	217	12.7%	1,494	87.3%	1,711
1957/58	218	12.8%	1,490	87.2%	1,708
1958/59	177	11.2%	1,410	88.8%	1,587
1959/60	193	11.8%	1,446	88.2%	1,639
1960/61	172	10.2%	1,520	89.8%	1,692
1961/62	207	11.4%	1,616	88.6%	1,823
1962/63	154	7.5%	1,906	92.5%	2,060
1963/64	155	6.6%	2,199	93.4%	2,354
1964/65	124	5.8%	2,000	94.2%	2,124
1965/66	139	6.0%	2,192	94.0%	2,331
1966/67	171	6.6%	2,434	93.4%	2,605
1967/68	209	7.2%	2,702	92.8%	2,911
1968/69	179	6.0%	2,788	94.0%	2,967
1969/70	166	5.5%	2,849	94.5%	3,015
1970/71	139	4.6%	2,911	95.4%	3,050
1971/72	205	5.2%	3,774	94.8%	3,979
1972/73	201	5.1%	3,746	94.9%	3,947
1973/74	184	5.0%	3,520	95.0%	3,704
1974/75	175	4.9%	3,392	95.1%	3,567
1975/76	173	6.0%	2,716	94.0%	2,889
1976/77	123	5.0%	2,323	95.0%	2,446
1977/78	176	5.4%	3,057	94.6%	3,233
1978/79	205	7.7%	2,457	92.3%	2,662
1979/80	215	5.0%	4,067	95.0%	4,282
1980/81	178	4.2%	4,023	95.8%	4,201
1981/82	184	4.2%	4,216	95.8%	4,400
1982/83	186	3.8%	4,658	96.2%	4,844
1983/84	131	4.5%	2,777	95.5%	2,908
1984/85	154	2.6%	5,776	97.4%	5,930
1985/86	139	1.9%	7,015	98.1%	7,154
1986/87	130	1.7%	7,630	98.3%	7,760
1987/88	133	1.5%	8,500	98.5%	8,633
1988/89	113	1.3%	8,273	98.7%	8,386
1989/90	105	1.2%	8,451	98.8%	8,556

Source: Ministry of Food & Agriculture, Govt. of Pakistan
1 Bale = 375 lbs.

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TEXTILE INDUSTRY CAPACITY, PAKISTAN
1949/50 to 1988/89

YEAR	INSTALLED				WORKING			POWER LOOMS	MILL SECTOR CAPACITY UTILIZATION	
	Mills	Spindles	Rotors (000)	Looms	Spindles (000)	Rotors	Looms	(est.)	Spindles	Looms
1949/50		137		3	137		3			
1950/51		182		3	182		3			
1951/52		225		3	225		3			
1952/53		499		6	302		4		61%	67%
1953/54		649		9	603		7		93%	78%
1954/55		1113		15	940		13		84%	87%
1955/56		1449		23	1355		19		94%	83%
1956/57		1518		24	1422		22		94%	92%
1957/58		1568		25	1447		22		92%	88%
1958/59	70	1569		26	1459		24		93%	92%
1959/60	72	1581		26	1488		24	0.5	94%	92%
1960/61	71	1582		27	1491		26		94%	96%
1961/62	76	1586		27	1531		26		97%	96%
1962/63	81	1644		28	1524		26		93%	93%
1963/64	83	1850		29	1810		28		98%	97%
1964/65	83	1913		30	1792		28	5.8	94%	93%
1965/66	89	1967		31	1852		27		94%	87%
1966/67	94	2056		31	1871		28		91%	90%
1967/68	95	2043		30	1888		28		92%	93%
1968/69	100	2048		30	1916		27		94%	90%
1969/70	107	2397		30	2090		27	22.5	87%	90%
1970/71	113	2175		31	2175		27		100%	87%
1971/72	131	2848		30	2650		26		93%	87%
1972/73	150	3226		29	3057		27		95%	93%
1973/74	155	3308		29	3034		26		92%	90%
1974/75	143	3410		29	2823		25	70	83%	86%
1975/76	127	3478	1	29	2579	1	23		74%	79%
1976/77	135	3544	1	29	2650	1	19		75%	66%
1977/78	140	3560	4	26	2680	2	15		75%	58%
1978/79	152	3704	14	27	2772	9	14		75%	52%
1979/80	149	3731	16	26	2841	15	16		76%	62%
1980/81	158	3983	19	25	3175	16	13		80%	52%
1981/82	155	4180	23	24	2943	22	14		70%	58%
1982/83	158	4265	27	24	3062	26	14		72%	58%
1983/84	162	4224	29	24	3020	25	12		71%	50%
1984/85	158	4396	29	23	3022	22	10		69%	43%
1985/86	162	4422	37	19	3159	25	10		71%	53%
1986/87	187	4292	48	17	3499	42	9	90	82%	53%
1987/88	197	4330	55	16	3691	46	9		85%	56%
1988/89	204	4421	56	14	3815	51	9	120	86%	64%

Sources: Economic Survey, 1988-89, and APTMA (1991)

YARN PRODUCTION, PAKISTAN & WORLD
1949 to 1989
(Metric tons)

YEAR	PAKISTAN	WORLD	PAK/WORLD
1949	4200	5410000	0.001
1950	6120	6020000	0.001
1951	8760	6590000	0.001
1952	9120	6550000	0.001
1953	53741	7000000	0.008
1954	87005	7275000	0.012
1955	124520	7350000	0.017
1956	136271	7640000	0.018
1957	143752	7704931	0.019
1958	156553	7812666	0.020
1959	174809	8509000	0.021
1960	185389	8780000	0.021
1961	187155	8535182	0.022
1962	200543 (est.)	8288000	0.024
1963	213931	7585677	0.028
1964	229887	7986027	0.029
1965	230205	8060000	0.029
1966	237712	9524611	0.025
1967	247043	9518000	0.026
1968	266580	9714400 (est.)	0.027
1969	303045	9910800 (est.)	0.031
1970	283800	10107200 (est.)	0.028
1971	322500	10303600 (est.)	0.031
1972	348900	10500000	0.033
1973	390820	10680000	0.037
1974	361880	10565000	0.034
1975	352910	10544173	0.033
1976	312300	11050424	0.028
1977	285000	10797588	0.026
1978	315100	11167820	0.028
1979	342894	11794589	0.029
1980	368100	11711989 (est.)	0.031
1981	399520	11629390	0.034
1982	395830	12802320	0.031
1983	466030	13185160	0.035
1984	381120	13365540	0.029
1985	417290	14278090	0.029
1986	469080	15109290	0.031
1987	599500	16027970	0.037
1988	641100	16288450	0.039
1989	762480	16519170	0.046

Source: ICAC, Cotton -- World Statistics, various years

PRODUCTION OF COTTON CLOTH, PAKISTAN & WORLD
1949 to 1989
(metric tons)

Year		Pakistan (formal)	(informal)	World		Pak/World
1949		10,271		3,425,518		0.003
1950		11,810		3,932,746		0.003
1951		14,185		4,330,291		0.003
1952		19,349		4,332,246		0.004
1953		27,947		4,698,355		0.006
1954		38,357		4,929,394		0.008
1955		50,355		4,852,771		0.010
1956		55,593		5,052,675		0.011
1957		58,562		5,058,078		0.012
1958		65,344		5,697,500		0.011
1959		70,142		6,083,000		0.012
1960		71,305		6,280,000		0.011
1961		79,271		6,182,635		0.013
1962	(est.)	80,552		5,990,000		0.013
1963		87,877		5,378,531		0.016
1964		86,008		5,577,979		0.015
1965		81,334		5,542,600		0.015
1966		78,864		5,507,670	(est.)	0.014
1967		87,779		5,472,739		0.016
1968		86,916		5,472,238		0.016
1969		90,151		5,754,179	(est.)	0.016
1970	(est.)	89,539		5,976,884	(est.)	0.015
1971	(est.)	94,498		6,152,663	(est.)	0.015
1972		79,016		6,600,000		0.012
1973		81,332		6,645,000		0.012
1974		77,460		6,680,000		0.012
1975		73,827		6,539,931		0.011
1976		64,095		6,762,347		0.009
1977		52,567		6,765,766		0.008
1978		49,841		6,960,538		0.007
1979		43,520		7,438,237		0.006
1980		47,356	207,427	7,410,939		0.006
1981		42,140	254,866	7,383,640		0.006
1982		40,840	232,846	7,413,060		0.006
1983		47,060	251,196	7,698,430		0.006
1984		31,330	234,749	7,558,160		0.004
1985		34,840	235,564	7,749,260		0.004
1986		32,400	240,866	8,371,070		0.004
1987		34,320		8,894,780		0.004
1988		35,770		9,016,500		0.004
1989		60,080		9,108,080		0.007

Source: ICAC: Cotton - World Statistics

COTTON & TEXTILES EXPORTS FROM PAKISTAN, 1947/48 to 1989/90
('000 metric tons)

YEAR	Raw Cotton			Yarn *			Cloth *		
	Qty.	% of Pak's cotton exports	% of global market	Qty.	% of Pak's cotton exports	% of global market	Qty.	% of Pak's cotton exports	% of global market
1947/48	212.4								
1948/49	148.1								
1949/50	188.2	100%		0.00	0%	0.0%	0.00	0%	0.0%
1950/51	227.2	100%		0.00	0%	0.0%	0.00	0%	0.0%
1951/52	197.4	100%		0.00	0%	0.0%	0.00	0%	0.0%
1952/53	277.8	100%	10.6%	0.00	0%	0.0%	0.00	0%	0.0%
1953/54	195.6	100%	6.7%	0.00	0%	0.0%	0.01	0%	0.0%
1954/55	141.6	100%	5.2%	0.00	0%	0.0%	0.00	0%	0.0%
1955/56	158.2	99%	5.6%	1.87	1%	1.4%	0.01	0%	0.0%
1956/57	110.7	88%	3.2%	12.55	10%	9.5%	1.92	2%	0.4%
1957/58	83.9	81%	2.7%	18.16	18%	11.9%	1.14	1%	0.2%
1958/59	81.9	96%	2.8%	3.07	4%	2.3%	0.45	1%	0.1%
1959/60	72.8	83%	1.9%	37.43	33%	21.5%	4.67	4%	0.7%
1960/61	53.4	52%	1.4%	41.05	40%	17.7%	8.40	8%	1.1%
1961/62	65.6	84%	1.9%	6.46	8%	3.4%	5.97	8%	0.8%
1962/63	149.2	96%	4.3%	2.01	1%	1.2%	4.74	3%	0.7%
1963/64	150.8	83%	3.8%	16.48	9%	7.4%	14.49	8%	1.9%
1964/65	105.7	65%	2.9%	35.39	22%	15.4%	20.84	13%	2.6%
1965/66	107.6	70%	2.9%	25.37	16%	10.0%	21.27	14%	2.7%
1966/67	122.7	70%	3.6%	29.52	17%	11.5%	23.61	13%	3.1%
1967/68	193.2	74%	6.1%	40.20	15%	15.6%	26.32	10%	3.5%
1968/69	132.0	57%	4.2%	65.01	28%	21.3%	35.93	15%	4.8%
1969/70	85.4	43%	2.2%	70.75	36%	21.0%	42.30	21%	6.0%
1970/71	102.6	43%	2.7%	87.17	37%	23.7%	48.20	20%	7.5%
1971/72	251.0	61%	6.1%	109.56	27%	29.4%	48.40	12%	7.1%
1972/73	185.0	46%	4.0%	160.70	40%	31.5%	58.07	14%	7.5%
1973/74	42.7	16%	1.0%	146.92	56%	28.3%	73.81	28%	8.9%
1974/75	230.7	60%	6.2%	74.57	19%	15.6%	77.46	20%	10.0%
1975/76	91.3	30%	2.2%	152.97	51%	29.2%	56.20	19%	7.4%
1976/77	14.4	9%	0.4%	95.91	60%	16.0%	48.81	31%	5.5%
1977/78	106.3	56%	2.6%	46.72	25%	8.9%	36.99	19%	4.5%
1978/79	55.8	31%	1.3%	74.88	41%	12.7%	51.65	28%	5.9%
1979/80	254.5	63%	5.1%	88.76	22%	12.0%	58.71	15%	4.7%
1980/81	327.7	67%	7.6%	97.21	20%	11.9%	66.56	14%	5.5%
1981/82	232.9	59%	5.2%	84.63	22%	10.8%	75.07	19%	0.7%
1982/83	266.2	58%	6.2%	112.53	24%	13.8%	84.02	18%	6.7%
1983/84	82.1	26%	1.9%	141.60	44%	15.0%	95.71	30%	6.7%
1984/85	274.5	60%	6.1%	93.93	21%	9.3%	85.75	19%	5.4%
1985/86	685.4	74%	15.3%	145.19	16%	14.8%	93.16	10%	7.9%
1986/87	630.3	68%	10.9%	202.49	22%	22.8%	92.74	10%	7.5%
1987/88	544.7	61%	10.7%	243.44	27%	22.5%	107.70	12%	8.1%
1988/89	595.4	63%	10.6%	235.53	25%		108.60	12%	
1989/90	719.0		13.0%						

Source: ICAC, Cotton — World Statistics

* these figures were published on a calendar year basis

RAW COTTON PRICES, 1951/52 to 1989/90
(U.S. cents/lb., C.I.F., Liverpool)

YEAR	PAKISTAN *	B INDEX Course Count	U.S./MEMPHIS SM 1-1/16"	USSR SM 1-1/16"
1951/52	58.21		46.16	
1952/53	39.08		41.14	
1953/54	39.63		39.62	
1954/55	40.09		40.68	
1955/56	34.95		39.75	
1956/57	34.24		33.35	
1957/58	33.89		35.8	
1958/59	30.64		32.7	
1959/60	30.55		29.75	
1960/61	32.02		31.08	
1961/62	32.73		31.22	
1962/63	29.82		30.65	
1963/64	28.29		29.52	
1964/65	29.1		29.88	
1965/66	27.95		29.27	
1966/67	26.01		28.72	30.02
1967/68	26.33		33.76	33.25
1968/69	26.08	24.5	30.35	30.41
1969/70	27.84	24.25	29.17	30.74
1970/71	31.08	28.65	31.52	33.23
1971/72	34.84	34	36.61	38.19
1972/73	36.58	35.55	43.5	43.1
1973/74	54.93	65.15	78.43	78.56
1974/75	45.25	46.1	56.82	53.51
1975/76	56.23	50.8	71.33	65.74
1976/77	57.87	72.15	82.33	81.95
1977/78	59.5	57.05	64.74	65.38
1978/79	66.36	67.95	76.25	77.92
1979/80	75.41	74.55	87.49	85.89
1980/81	84.94	84.2	101.23	92.8
1981/82	65.65	64.4	76.3	73.02
1982/83	65.59	66.6	77.94	70.68
1983/84	75.2	80.4	87.09	91.15
1984/85	56.22	59.55	73.69	
1985/86	37.35	40.95	58.28	47.63
1986/87	55.48	55.05	62.17	62.85
1987/88	66.47	67.5	76.29	76.18
1988/89	57.17	61.3	68.94	66.18
1989/90	74.82	75.57	80.62	81.89

Source: ICAC -- Cotton - World Statistics

* 1952-81: 289F Punjab SG
1981-84: Sind SG
1984-85: Sind/Punjab SG
1985-86: Afzal 1"
1986-89: Afzal 1-3/32"

COTTON YARN PRICES AT KARACHI
1971/72 to 1990/91
(rs./10 lb. bundle)

YEAR	COUNT		
	10/1	20/1	40/1
1971/72	29.22	32.88	52.23
1972/73	45.41	55.49	88.27
1973/74	48.57	54.45	98.83
1974/75	40.51	44.40	74.48
1975/76	54.95	61.63	93.71
1976/77	75.17	85.63	124.21
1977/78	66.03	75.67	118.33
1978/79	82.58	93.83	133.63
1979/80	80.84	91.90	137.17
1980/81	97.76	100.25	146.00
1981/82	86.97	98.24	143.52
1982/83	99.88	114.79	165.82
1983/84	130.06	143.95	202.08
1984/85	98.90	113.00	171.71
1985/86	96.28	114.87	175.46
1986/87	115.81	144.85	239.71
1987/88	117.81	150.63	265.97
1988/89	126.60		235.71
1989/90	156.98		
1990/91	181.55		

Source: APTMA

COTTON SECTOR EXPORT EARNINGS, PAKISTAN, 1969/70 to 1988/89

YEAR	Raw Cotton (Rs. ml.) nominal	real	share	Cotton Yarn* (Rs. ml.) nominal	real	share	Cotton Cloth (Rs. ml.) nominal	real	share	Total Cotton Sector Exports (Rs. ml.) nominal	real	Total Pakistan Exports (nominal)	(real)	Textiles Share Total Exports	General Wholesale Price Index (1975/76=100)
1969/70	210	482	29.09%	254	583	35.18%	258	592	35.73%	722	1,656	1,609	3,691	44.87%	43.59
1970/71	270	584	28.78%	357	772	38.06%	311	672	33.16%	938	2,027	1,998	4,318	46.95%	46.27
1971/72	955	1,971	49.05%	605	1,249	31.07%	387	799	19.88%	1,947	4,019	3,371	6,958	57.76%	48.45
1972/73	1,167	2,081	26.60%	1,974	3,519	44.99%	1,247	2,223	28.42%	4,388	7,823	8,551	15,245	51.32%	56.09
1973/74	367	493	10.06%	1,864	2,503	51.10%	1,417	1,903	38.94%	3,648	4,898	10,161	13,643	35.90%	74.48
1974/75	1,544	1,676	41.01%	908	986	24.12%	1,313	1,426	34.87%	3,765	4,088	10,286	11,168	36.60%	92.10
1975/76	981	981	25.80%	1,462	1,462	38.45%	1,359	1,359	35.74%	3,802	3,802	11,253	11,253	33.79%	100.00
1976/77	292	261	9.39%	1,215	1,086	39.07%	1,603	1,432	51.54%	3,110	2,779	11,294	10,091	27.54%	111.92
1977/78	1,102	912	27.73%	1,131	936	28.46%	1,741	1,441	43.81%	3,974	3,289	12,980	10,744	30.62%	120.81
1978/79	655	508	13.63%	2,014	1,563	41.92%	2,135	1,657	44.44%	4,804	3,728	16,925	13,135	28.38%	128.85
1979/80	3,321	2,295	42.33%	2,108	1,457	26.87%	2,416	1,669	30.80%	7,845	5,420	23,410	16,175	33.51%	144.73
1980/81	5,203	3,179	53.40%	2,151	1,314	22.08%	2,390	1,460	24.53%	9,744	5,953	29,280	17,887	33.28%	163.69
1981/82	2,933	1,668	36.53%	2,156	1,224	26.81%	2,949	1,674	36.67%	8,043	4,566	26,270	14,913	30.62%	176.16
1982/83	3,897	2,138	36.14%	3,308	1,815	30.68%	3,579	1,964	33.19%	10,784	5,916	34,442	18,896	31.31%	182.27
1983/84	1,772	880	18.32%	3,047	1,513	31.49%	4,856	2,411	50.19%	9,675	4,804	37,339	18,542	25.91%	201.38
1984/85	4,368	2,091	33.47%	4,046	1,937	31.00%	4,638	2,220	35.53%	13,052	6,247	37,979	18,179	34.37%	208.92
1985/86	8,291	3,814	46.20%	4,572	2,103	25.48%	5,083	2,338	28.32%	17,946	8,256	49,592	22,814	36.19%	217.38
1986/87	7,676	3,359	34.31%	8,766	3,836	39.18%	5,931	2,595	26.51%	22,373	9,790	63,268	27,685	35.36%	228.53
1987/88	5,166	3,628	34.15%	5,839	4,101	38.60%	4,123	2,896	27.25%	15,128	10,624	44,347	31,145	34.11%	142.39
1988/89	6,565	4,178	33.14%	6,636	4,224	33.49%	6,611	4,208	33.37%	19,812	12,609	55,909	35,584	35.44%	157.12

Source: Economic Yearbook of Pakistan, 1988

* includes cotton thread

EXPORTED SHARE OF TOTAL COTTON PRODUCTION
PAKSITAN, 1947/48 to 1988/89
('000 MT)

YEAR	TOTAL PRDN. (1)	TOTAL XPORTS (2)	SHARE (2)/(1)
1947/48	188.02	212.4	1.13
1948/49	163.88	148.1	0.90
1949/50	210.63	188.2	0.89
1950/51	239.02	227.2	0.95
1951/52	237.49	197.4	0.83
1952/53	303.28	277.8	0.92
1953/54	242.25	195.6	0.81
1954/55	269.11	141.6	0.53
1955/56	285.26	158.2	0.55
1956/57	290.87	110.7	0.38
1957/58	290.36	83.9	0.29
1958/59	269.79	81.9	0.30
1959/60	278.63	72.8	0.26
1960/61	287.64	53.4	0.19
1961/62	309.74	65.6	0.21
1962/63	350.20	149.2	0.43
1963/64	400.18	150.8	0.38
1964/65	361.08	105.7	0.29
1965/66	396.27	107.6	0.27
1966/67	443.02	122.7	0.28
1967/68	494.87	193.2	0.39
1968/69	504.39	132.0	0.26
1969/70	512.04	85.4	0.17
1970/71	518.67	102.6	0.20
1971/72	676.43	251.0	0.37
1972/73	670.99	185.0	0.28
1973/74	629.68	42.7	0.07
1974/75	606.39	230.7	0.39
1975/76	491.13	91.3	0.19
1976/77	415.82	14.4	0.03
1977/78	549.61	106.3	0.19
1978/79	452.54	55.8	0.12
1979/80	727.94	254.5	0.35
1980/81	714.17	327.7	0.46
1981/82	748.00	232.9	0.31
1982/83	823.48	266.2	0.32
1983/84	494.36	82.1	0.17
1984/85	1008.10	274.5	0.27
1985/86	1216.18	685.4	0.56
1986/87	1319.20	630.3	0.48
1987/88	1467.61	544.7	0.37
1988/89	1402.50	595.4	0.42

Source: author's calculation

COTTON INPUT USE, PAKISTAN
1960/61 to 1990/91

YEAR	Fertilizer ('000 N tons)	Improved Seed ('000 tons)	Area Sprayed ('000 hectares)	Pesticides ('000 MT)	Water Avail. (maf)
1960/61	5				
1961/62	6				
1962/63	6				
1963/64	11				
1964/65	14				
1965/66	11				63.8
1966/67	18				67.5
1967/68	31				68.5
1968/69	39				72.8
1969/70	49				75.8
1970/71	45				69.9
1971/72	61				71.1
1972/73	70				81.2
1973/74	65				80.1
1974/75	68				77
1975/76	88		329		85.9
1976/77	101		557		84.6
1977/78	114	15	530		89.4
1978/79	141	14	442		87.4
1979/80	167	17	277		91.1
1980/81	172	19	182		96.8
1981/82	173	20	273	905.4	96.5
1982/83	199	17	383	1345.4	101.4
1983/84	192	21	598	1756.9	103.7
1984/85	200	20	1007	2584.8	102.8
1985/86	237	20	1204	3489.3	103.4
1986/87				4111.5	
1987/88				4428.9	
1988/89				4065.0	
1989/90				4706.0	
1990/91				5730.0	

Source: Report of the National Commission on Agriculture, appendix Table 21 and Cotton Research Institute interview

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