APCOM SERIES No. 205

SUPPORT PRICE POLICY FOR SEED COTTON, 2003-04 CROP

AGRICULTURAL PRICES COMMISSION
GOVERNMENT OF PAKISTAN
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ABBREVIATIONS

AARI	:	Ayub Agricultural Research Institute
ALMA	:	Agricultural and Livestock Marketing Adviser
APCOM	:	Agricultural Prices Commission
APTMA	:	All Pakistan Textile Mills Association
BCR	:	Benefit Cost Ratio
BPS	:	Basic Pay Scale
CEC	:	Cotton Export Corporation
CIF	:	Cost, Insurance and Freight
CLCV	:	Cotton Leaf Curl Virus
COP	:	Cost of Production
CPI	:	Consumer Price Index
CRIM	:	Cotton Research Institute, Multan
CRIS	:	Cotton Research Institute, Sakrand
ECC	:	Economic Coordination Committee
E&M	:	Economics & Marketing
FAQ	:	Fair Average Quality
FBS	:	Federal Bureau of Statistics
FCA	:	Federal Committee on Agriculture
FOB	:	Free on Board
FSCD	:	Federal Seed Certification Department
FYM	:	Farm Yard Manure
GCP	:	Ghee Corporation of Pakistan
GDP	:	Gross Domestic Product
GOT	:	Ginning Out Turn
ICAC	:	International Cotton Advisory Committee
ICPM	:	Integrated Crop Production Management
IPM	:	Integrated Pest Management
IPNS	:	Integrated Plant Nutrition System
IRRI	:	International Rice Research Institute (Group of rice varieties Grown in Pakistan which were developed at this Institute)
ITMF	:	International Textile Mills Forum
KCA	:	Karachi Cotton Association
MINFAL	:	Ministry of Food, Agriculture and Livestock
MOC	:	Ministry of Commerce
NIAB	:	Nuclear Institute of Agriculture and Biology
NWFP	:	North West Frontier Province
NSC	:	National Seed Council
OLS	:	Ordinary Least Squares
PAPA	:	Pakistan Agriculture Pesticides Association
PARC	:	Pakistan Agricultural Research Council
PASSCO	:	Pakistan Agricultural Storage and Services Corporation of Pakistan
PCCC	:	Pakistan Central Cotton Committee
PCGA	:	Pakistan Cotton Ginners Association
PCSI	:	Pakistan Cotton Standards Institute
PSC	:	Punjab Seed Corporation
SSC	:	Sindh Seed Corporation

SUPPORT PRICE POLICY FOR SEED COTTON, 2003-04 CROP

Introduction

Cotton, the silver fibre, is the largest cash crop of Pakistan. It is cultivated over an area of 3 million hectares, accounting for 14 per cent of the annually cropped area. Its share in value added by major crops is around 30 per cent. Cotton farming remains the principal source of raw material for the textile sector, employing 40 per cent of the industrial labour force. The foreign exchange earned from exports of cotton and its made-ups constitute 50 per cent of the earnings from merchandise exports. Cotton seed, a valuable by-product of cotton production, is an important source of edible oil and also used in feeding livestock.

2. As the number of spindles in the domestic textile industry has increased from 6.14 million in 1991-92 to 8.84 million in 2001-02, domestic use of cotton has increased from 7 million bales to 11 million. Consequently, yarn production has jumped from 1,171 million kgs to 1,799 million and production of cloth expanded from 308 million square meters to 559 million.

3. The cotton production in Pakistan since early 90's has experienced wide fluctuations. Peaking at 12.8 million bales in 1991-92, it fell to 9 million in 1992-93 and 8 million in 1993-94. Cotton production varying from 10 to 11 million bales in the last 3 years has become a very risky enterprise for the farmers. Its production remains vulnerable to a wide variety of insects attack as well as to leaf curl virus. Its marketing has become a risky proposition and a source of concern for the growers. In good crop years they have invariably faced low prices impacting on their income and well being. The variation in cotton production and prices has adversely affected all the cotton related/dependent sub sectors of the economy.

4. To reduce price risk in cotton farming and ensure reasonable supply to industry and trade, the Government has instituted the support price programme for seed cotton. The Economic Coordination Committee of the Cabinet in its meeting held on 8th May 2002 fixed the support price for seed cotton 2002-03 during crop season at Rs 800 per 40 kgs, for base grade 3 with

staple length 1-1/32" and micronaire range of 3.8 – 4.9 NCL, to be implemented by Trading Corporation of Pakistan (TCP).

5. The following premium/discount rates for higher/lower quality grades and staple lengths of seed cotton were also approved.

Premia (+)/Discounts (-) for Higher/Lower Grades and Staple Length

(Rupees per 40 kgs)

Grade	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
	---------- Rupees per 40 kgs ----------				
Super	25	42	59	76	94
One	10	28	45	62	80
Two	-2	16	33	50	67
Three	-17	Base	17	34	51
Four	-35	-18	-1	16	34
Five	-53	-36	-19	-2	16

6. In formulating support price policy proposals for the 2003-04 crop, APCom adopted the following procedure.

i) For updating prices of inputs and rates of various field operations and marketing costs, a mini field survey in the important cotton growing areas of Punjab and Sindh and Nasirabad district of Balochistan was conducted during December 2002. During the field survey, the problems and constraints faced by the growers in the production and marketing of cotton were also discussed.

ii) Data on domestic and international cotton production, consumption, stocks, trade and prices were collected from various agencies and sources. These data were analysed and results are presented in the report to provide the background information for policy formulation.

iii) The annual meeting of APCom's Standing Committee on cotton was convened on 17th February, 2003 at Faisalabad. The meeting was attended by progressive growers, traders, cotton experts, representatives of textile industry, federal and provincial governments and farmers' organizations. The meeting discussed, at length, the issues faced by cotton growers and the allied sub sectors.

7. In view of the importance of cotton in the economy, there is an urgent need to stabilize its production at a level which not only caters for the increasing domestic requirements but also leaves sufficient stocks for exports. The provision of improved technology and assurance of producer prices at a reasonable level can help in maintaining investment in cotton farming. Increasing cotton production will also help in reducing dependence on the imports of edible oils and thus contribute in saving foreign exchange. In addition to support price, a number of non-price measures have also been recommended for improving the efficiency of production and marketing systems of seed cotton in this Report.

(Dr. Abdul Salam)
Chairman, APCom

March 5, 2003.

2. SUMMARY OF FINDINGS AND RECOMMENDATIONS

2.1 Findings

Provincial Shares In Area And Production

8. Punjab and Sindh are the main cotton producing provinces with their respective shares at 81 and 18 per cent in its area and 77 and 22 per cent in production, respectively.

Important Cotton Producing Districts

9. R.Y.Khan, Bahawalpur, Vehari, Lodhran, Rajanpur, Khanewal, Multan, Muzaffargarh, Bahawalnagar and D.G.Khan in the Punjab and Ghokti, Sanghar, Khairpur and Nawabshah in Sindh are important cotton producing districts. These 14 districts collectively account for 85 per cent of the total production of cotton in the country. Accordingly, any set back to cotton in terms of production or prices has serious implications for the economy of these districts.

Area Yield and Production

- **Long-term Changes: 1992-93 to 2002-03**

10. Cotton production, at country level, during the decade ending 2002-03 is estimated to have risen @ 2.1 per cent per year on account of 1.7 per cent yearly increase in yield and 0.4 per cent expansion in area. In the Punjab cotton production has increased @ 0.6 per cent per annum entirely due to rise of 0.8 per cent in yield as the area contracted @ 0.2 per cent per year. In Sindh cotton production has increased @ 8.8 per cent, attributable to 6.2 per cent annual rise in yield and 2.5 per cent expansion in area.

- **Short-term Changes: 2002-03 vs. 2001-02**

11. According to the second estimates of Provincial Agriculture Departments, cotton production is estimated at 10 million bales. The crop harvest is 5.8 per cent less in comparison to the last year, which is attributable to 12 per cent contraction in area as the yield is up by 7.1 per cent. Cotton production in Punjab, estimated at 7.4 million bales is 7.5 per cent short of last year,

which is attributable to 14.7 per cent contraction in area as the yield has improved by 8.4 per cent. Cotton production in Sindh estimated at 2.4 million bales is slightly (1.3 per cent) less than previous year's crop.

Targets Vs Achievements: 2002-03

12. FCA had set target of cotton production for 2002-03 crop at 10.07 million bales. As per second estimates, production reported at 10 million bales is marginally (0.7 per cent) less than the target fixed because of under achievement in area. In the Punjab production of 7.4 million bales has fallen short of the target of 7.9 million bales by 5.8 per cent while in Sindh production of 2.4 million bales has exceeded the target of 2 million bales by 20.6 per cent. In Balochistan production is short of the target by 13.5 per cent entirely due to 32.3 per cent under achievement in area.

Domestic Supply, Demand and Stocks

13. The size of cotton harvest in 2002-03 is reported at 10 million bales. Adding opening stocks of 2.42 million and imports of 0.36 million bales, total supplies come to 12.78 million bales. Accounting for domestic consumption (mill and non mill sectors) of 11.40 million bales, exports of 0.15 million and imports of 0.36 million upto February 2003, end year stocks may be around 1.23 million bales, subject to the actual imports/exports during the rest of the year.

Price Situation

- **Seed cotton (phutti prices)**

14. In the Punjab, the monthly wholesale prices of seed cotton (phutti) during 2002-03 (September to January) ranged between Rs 835 per 40 kgs (in Okara in September 2002) and Rs 959 per 40 kgs (in Multan in January 2003). In Sindh the prices ranged between Rs 763 (in Mirpur Khas in December 2002) and Rs 884 (in Nawabshah in October 2002).

- **Cotton (lint) prices**

15. Monthly average spot rates for "Base Grade" with staple length 1-1/32" and micronaire values between 3.8 to 4.9 NCL (No Control Limit), as announced by Karachi Cotton Association (KCA), have ranged between Rs 2,466 and Rs 2,912 per 40 kgs during August 2002 to February 2003.

Cost of production

- **Punjab**

16. Based on average yield of 671 kgs per acre, cost of production of seed cotton in the Punjab for 2003-04 crop is estimated at Rs 815 per 40 kgs. Adding marketing cost @ Rs 15 per 40 kgs, the cost of producing and delivering seed cotton at market/ginnery comes to Rs 830, higher by Rs 59 (8 per cent) than the previous year's corresponding cost estimated at Rs 771 per 40 kgs.

- **Sindh**

17. The cost of production of seed cotton, at farm gate, for 2003-04 crop in Sindh is estimated at Rs 718 per 40 kgs. Adding the marketing expenses @ Rs 15 per 40 kgs, the cost of producing and delivering the produce at market/ginnery would work out to Rs 733, up by Rs 34 (5 per cent) as compared to the cost of Rs 699 for the last year.

18. The increase in the production cost of seed cotton for the 2003-04 crop is primarily attributable to the higher costs of cultural operations and supplementary irrigation mainly because of increases in the price of diesel and power tariff, higher cost of plant protection, rises in the prices of chemical fertilizers, picking charges and land rentals.

Comparative Economics of Cotton and Competing Crops

- **Punjab**

19. The cotton growers have received remunerative prices of seed cotton during 2002-03 crop season. Resultantly, cotton farming has become an attractive proposition as reflected by

various economic indicators. Cotton enjoyed a distinct edge over rice in respect of all the economic indicators, i.e. output–input ratio and returns to purchased inputs, crop duration and irrigation water. However, basmati rice had a marginal edge over cotton in terms of gross revenue per day of crop duration.

20. In case of indirect competition with sugarcane, the cotton – sunflower rotation has a clear-cut edge in terms of important economic indicators. The cotton-wheat rotation also out-competes sugarcane in respect of all the economic criteria except returns to purchased inputs. One of the important factors in the poor economics of sugarcane was its low prices received by the farmers.

- **Sindh**

21. In Sindh too, cotton farming had a distinct edge over rice farming in terms of returns to overall investment, purchased inputs, crop duration and irrigation water.

22. In case of indirect competition with sugarcane, both cotton – wheat and cotton – sunflower rotations out ranked sugarcane in terms of all the indicators as farmers received low prices of sugarcane in 2002-03.

Economics of Fertilizer Use

23. To assess the profitability of fertilizer use on seed cotton, two commonly known indicators viz benefit cost ratio (BCR) and parity ratio between the prices of fertilizer and seed cotton have been computed.

- **Benefit Cost Ratio (BCR)**

24. BCRs at various response ratios reflect a wide range. The fertilizer use was however, most profitable during 1994-95 and resulted from remunerative prices of seed cotton in the open market. Since then, due to opposite trends in input-output prices, BCRs were on the decline and reached the lowest level during 1999-00 (1.66 to 2.51 at various response ratios). During

2000-01, the economics of fertilizer use in cotton had improved as market prices of cotton rose. But as a result of sharp fall in cotton prices in 2001-02 economics of fertilizer use deteriorated. However, during 2002-03 profitability of fertilizer use on cotton has improved due to its remunerative prices.

- **Parity Ratios**

25. The parity ratio between prices of nitrogen and seed cotton estimated at 0.93 in 1992-93 improved in favour of seed cotton and reached 0.50 in 1994-95. Afterwards as the parity ratio increased, the purchasing power of seed cotton in terms of nitrogen deteriorated upto 1999-00. During 2000-01, comparatively higher increase in prices of "phutti" improved its purchasing power and only 0.62 units were needed to buy one unit of nitrogen. However, due to rise in price of nitrogen and sharp decline in the price of seed cotton this position could not be sustained in 2001-02. Nevertheless, on the back of substantial rise in the market prices of seed cotton in 2002-03, its purchasing power in terms of nitrogenous fertilizers has improved by 13.5 per cent.

26. The parity between prices of phosphorus and seed cotton has experienced similar trend as discussed above for nitrogen. The parity ratio declined from 0.82 in 1992-93 to the minimum level of 0.55 in 1994-95, showing improvement in the purchasing power of seed cotton. However, in the following years this position could not be maintained due to low prices of the produce and higher prices of phosphorus. During 1999-00, the sharp decline in the seed cotton price heavily weighed against the crop and 1.61 units of phutti were required to buy one unit of phosphatic fertilizer. In the year 2000-01, the position improved in favour of seed cotton but deteriorated in the following year as prices of 'P' rose while those of seed cotton steeply declined. The purchasing power of seed cotton in terms of phosphate fertilizers has nevertheless improved by 12 percent in 2002-03.

Real Prices of Seed Cotton (Phutti)

- **Support prices**

27. The nominal support price of seed cotton (phutti) during the period of 1990-91 to 2002-03 indicates a cumulative increase of 227 per cent i.e. from Rs 245 per 40 kgs in 1990-91 to Rs 800 per 40 kgs in 2002-03. During the same period, the CPI has risen by 151 per cent.

Consequently, the real support price of seed cotton in 2002-03 crop year, estimated at Rs 319 per 40 kgs in 1990-91 rupees, showed an improvement of 30 per cent over corresponding price in 1990-91. However, in the intervening period the real value of the support price of seed cotton has experienced many ups and downs.

- **Market prices**

28. The nominal market price of seed cotton (phutti) averaging at Rs 330 per 40 kgs during the picking season of 1990-91 crop has risen to Rs 921 per 40 kgs in 2002-03, showing an overall increase of 179 percent. During the same period, the CPI is estimated to have increased by 151 per cent. Consequently, the real market price of seed cotton (phutti) has surged from Rs 330 to Rs 367 per 40 kgs in 2002-03, in 1990-91 rupees, reflecting a rise of 11 per cent in the real value of market price of seed cotton over the corresponding value in 1990-91.

World Production, Consumption, Stocks and Trade

29. The world production of cotton for the year 2002-03 is projected at 19.30 million tonnes, 2.22 million tonnes more than the previous year. After adding opening stocks of 10.38 million, the global supply of cotton in 2002-03 works out to 29.68 million tonnes, 1.07 million tonnes lower than the previous year. Total consumption in 2002-03 is projected at 20.87 million tonnes while end year stocks are expected 8.81 million tonnes. World export of cotton during the current year is forecast at 6.45 million tonnes.

International Prices

30. The cif (North Europe) prices of Sindh/Punjab (Afzal 1-1/32″), Index 'B' and Orleans Texas (Strict Low Middling 1-1/32″) cottons averaging at 58.23, 58.44 and 62.06 cents per lb respectively in 1991-92, touched their highest levels of 82.17, 81.19 and 88.02 cents in 1995-96. Having peaked in 1995-96, cotton prices were on the decline averaging at 47.23, 49.55 and 50.19 cents per lb, respectively in 1999-00. The prices recovered slightly and averaged at 56.78, 53.70 and 53.57 cents in 2000-01 but fell sharply in 2001-02, hovering around 38.41, 38.95 and 39.05 cents, the lowest since 1991-92. From August 2002 to January 2003 cotton prices have again recovered and averaged at 47.40, 47.93 and 47.76 cents, respectively.

Parity Prices

31. Parity prices of seed cotton worked back at ginnery level from various base prices are summarized below:

	Base	Worked back price of seed cotton at ginnery level Rupees per 40 kgs
1.	**Domestic parity price based on:**	
	Cotton yarn (21's) price at Karachi (Annex-X)	811
2.	**Export parity prices based on average:**	
	i) Actual export price of Pakistani cotton (Annex-XI)	
	- During 2002-03 (Aug-Dec)	735
	- During 1997-98 to 2001-02	974
	ii) Cif (North Europe) value of Index-B cottons: (Annex-XII)	
	- During 2002-03 (Aug-Jan)	816
	- During 1997-98 to 2001-02	907
	iii) Cif (North Europe) quotations of Afzal 1-1/32": (Annex-XII)	
	- During 2002-03 (Aug-Jan)	807
	- During 1997-98 to 2001-02	902
	iv) Futures contract prices of New York No.2 cotton (average of October 2003, December 2003 and March 2004) (Annex-XIII)	941
	v) Fob prices of Pakistani cotton yarn (20's): (Annex-XIV)	
	- During 2002-03 (Aug-Jan)	840
	- During 1997-98 to 2001-02	1,007
3.	**Import parity prices based on average:**	
	i) Cif (North Europe) quotations of Orleans/Texas SLM 1-1/32" (Annex-XV)	
	- During 2002-03 (Aug-Jan)	1,149
	- During 1997-98 to 2001-02	1,306
	ii) Actual cif Karachi prices of imported cotton: (Annex-XVI)	
	- During 2002-03 (Aug-Dec)	1,136
	- During 1997-98 to 2001-02	1,236

Economic Efficiency in Cotton Production

32. The analysis of NPCs and EPCs estimated for the period from 1999-2000 to ~~2002-03~~ 2003-04 under exporting scenario indicates that the cotton production has been taxed in some years and

subsidized in others. This has happened due to sharp fluctuations in the international prices of cotton. Although the domestic prices, in sympathy with the world market, have fluctuated during the period of analysis, nevertheless, fluctuations in international market have been much more pronounced, changing the situation of taxation of cotton production to its subsidization and vice versa. The NPCs and EPCs estimated under importing scenario (2002-03) are consistently and substantially less than one which indicate implicit taxation of the commodity.

Economic Efficiency Coefficients for Seed Cotton (Average Farmers)

Province/Year	NPCs	EPCs	DRCs	Cost of domestic resources to earn/save forex of one $
				Rupees per US $
Punjab				
- Based on average export parity prices (1999 to 2002)	1.04	0.94	0.80	46.40
- Based on average import parity prices (1999 to 2002)	1.03	0.94	0.70	40.60
Sindh				
- Based on average export parity prices (1999 to 2002)	0.69	0.54	0.45	26.33
- Based on average import parity prices (1999 to 2002)	0.68	0.55	0.42	24.11

33. DRCs estimated under exporting scenario have been less than one during the period from 1999-2000 to 2002-2003 (3-04), implying that Pakistan has a comparative advantage in cotton production. DRCs calculated under importing scenario for the above mentioned period are also less than one, but much lower than those estimated under exporting scenario. These numerics further indicate that cost of domestic factors involved in earning or saving one unit of foreign exchange through cotton production is much below the exchange rate.

Cotton Production Prospects and Marketing Issues in Balochistan

34. Cotton farming has good prospects in Balochistan because of its better quality and being free from contamination. However, farmers are generally unaware of its production technology.

They are also constrained due to non-availability of quality seed, farm machinery, lack of facilities for ginning and marketing of seed cotton.

2.2 Recommendations

2.2.1 The support price

35. According to the analysis of the relevant factors summarized in paras-134 to 144 of this Report, the support price for the 2003-04 seed cotton crop for base grade 3 with staple length 1-1/32" and micronaire range of 3.8 – 4.9 NLC is recommended at Rs 850 per 40 kgs. The proposed support price provides a margin of around 5 per cent on an average, over the cost of production.

2.2.2 Implementation of support price and quality premiums/discounts

i) TCP be assigned the task of implementing the support price of seed cotton through the procurement of lint at the support price worked out based on the above recommended price of seed cotton.

ii) Sufficient resources be provided to TCP for effective implementation of the support price. The genuine losses in support price operations, if any, should be picked up by the government.

iii) TCP should also enforce the premia and discounts in the purchase of lint as given below:

Premia/Discounts for Various Grades/Staple Lengths for Lint Offered to the Procurement Agency

(Rs per 40 kgs)

Grade	Staple length				
	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
Super	113	172	231	288	347
One	61	118	175	231	288
Two	4	60	116	170	226
Three	-54	Base	54	107	161
Four	-116	-64	-12	40	92
Five	-178	-128	-77	-28	23

Discounts for the Micronaire Beyond Specified Limits

Micronaire below 3.8 in Grades Super, 1,2 and 3 and below 3.5 in Grades 4 and 5 or micronaire in excess of 4.9 for all grades	Per cent discount
0.1	0.5
0.2	1.0
0.3	2.0
0.4	3.0
0.5	4.0

Note: The varieties grown in Pakistan generally do not have problems of micronaire as it falls within the acceptable limits during most of the picking season except for very early or late pickings.

2.2.3 Improving productivity

Improved Seed

i) The Punjab Seed Corporation should enhance the supply of quality seed of disease resistant varieties and undertake aggressive marketing to promote the use of certified seed.

ii) Premature releases of various varieties be discouraged.

iii) Public and private agencies in cotton seed business be asked to multiply and distribute the seed of recommended varieties only. The Government should also launch a campaign to promote the cultivation of only the recommended varieties.

Integrated Pest Management (IPM)

i) The Government should strengthen the Farmer-led Cotton IPM Programme of NARC for its effective implementation in the cotton growing areas of the country.

ii) The private companies should be encouraged for commercial rearing and marketing of useful insects and other predators.

iii) IPM Institute at Multan should undertake research on microbial control of pests and introduce its findings among the growers for their adoption.

iv) The research work to determine the effectiveness of insect growth regulators should be expedited and results disseminated for practical utility.

v) Extension staff in collaboration with private pesticide companies should promote the use of sex-pheromones.

Quality Control of Pesticides

i) The electronic mass media be used for training the growers in pest scouting and judicious methods of pest control to arrest the increasing menace of indiscriminate use of pesticides and environmental hazards.

ii) Each pesticide company be asked to appoint its own dealers for sale of a product imported and marketed by that company. Branded pesticides should only be available from the authorized dealers and strict quality control on the sales of pesticides be enforced.

iii) Magistrates be appointed/posted/transferred with Agricultural Department for speedy disposal of pesticide cases.

2.2.4 Improving quality and marketing

- **Picking**

36. The Provincial Extension Departments should launch educational campaign to apprise the growers about the improved practices of cotton picking. Picking should start when dew has dried and about 60% of the bolls have opened. Picked seed cotton be kept separately for each variety. First and last pickings and produce from healthy and non-healthy bolls may not be mixed.

- **Ginning**

i) A Ginning Research Institute should be established at Multan to deal with the issues of cotton grades and other problems relating to the quality of lint.

ii) In order to avoid problems in crop estimation and exports, ginning factories should be advised to adhere to the standard weight of the bale of 170 kgs.

- **Proper packing and labeling**

37. The Government should ensure truthful labeling and proper packing of cotton lint in accordance with the grade, staple length and micronaire contained in the bale.

- **Contamination free cotton**

i) The use of Hessian bags in cotton marketing, as banned in the Punjab, be banned in other provinces as well.

ii) Textile industry should come forward for the success of highly desired and valuable programme of producing contamination free cotton and purchase all the bales of clean cotton.

- **Underweighment and undue deductions**

38. In order to check the malpractices of underweighment and undue deductions in cotton marketing, supervisory committees consisting of the representatives of Provincial Agriculture Departments, local market committees, growers and cotton dealers may be constituted.

2.2.5 Review of import policy

- The Government should review import policy with regard to agricultural commodities, so as to discourage their imports particularly in the beginning and during the harvesting seasons of the respective commodities.

- The Government should discourage the import of short staple cottons which are available in abundance in Pakistan. The cotton trade be so regulated as not to adversely affect the producer prices.

- Arrangements should be made to record the staple length of every imported consignment of cotton through PCSI.

2.2.6 Cotton production prospects and marketing issues in Balochistan

39. It is imperative to support the cotton growers in Balochistan with the technical know-how and technology package as well as arrangements for efficient marketing of the produce.

3. SOWING AND PICKING TIMES

40. In major cotton growing districts of Sindh and the Punjab sowing of cotton is generally recommended from the start of May to end June. The recommended sowing times for various cotton growing districts by province are detailed in Annex – I.

41. Picking of cotton in Sindh and in some parts of the Punjab starts in August and may continue upto February in certain cases.

4. PROVINCIAL SHARES IN AREA AND PRODUCTION

42. During the three years period of 2000-01 to 2002-03, the average annual production of cotton at country level has been calculated at 10.45 million bales from 2.93 million hectares (7.24 million acres). The Provincial shares in area and production as calculated from these data are given in Table-1 and also depicted in Figures-1 and 2.

Table-1: Provincial Shares in Area and Production of Cotton: Average of 2000-01 to 2002-03

Country/Province	Area		Production	
	000 hectares	Per cent	000 bales	Per cent
Pakistan	2929	100	10447	100
Punjab	2356	81	8010	77
Sindh	538	18	2332	22
Other provinces	35	1	105	1

Source: Worked out from the data given in Annex-II.

43. Punjab and Sindh are the main cotton producing provinces: with their respective shares estimated at 77 and 22 per cent in total production of the crop in recent years.

PROVINCIAL SHARES IN AREA & PRODUCTION OF COTTON: AVERAGE OF 2000-01 TO 2002-2003

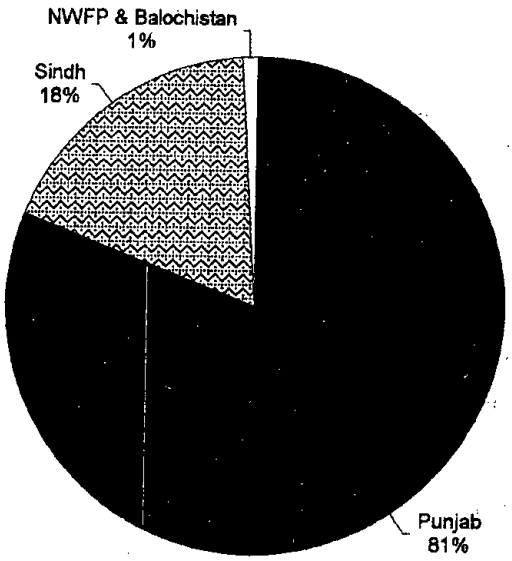

Fig-1: SHARES IN AREA

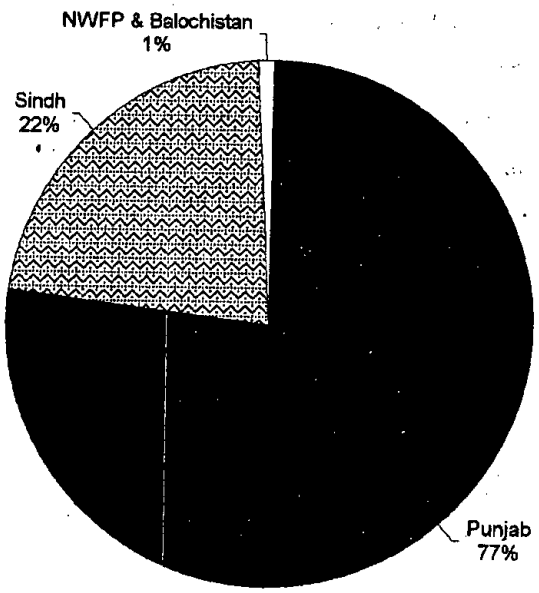

Fig-2: SHARES IN PRODUCTION

5. IMPORTANT COTTON PRODUCING DISTRICTS

44. Cotton in Pakistan is cultivated under irrigated conditions. Its production is concentrated in the southern parts. The districts producing more than two lac bales per year are Rahim Yar Khan, Bahawalpur, Vehari, Lodhran, Rajanpur, Khanewal, Multan, Muzaffargarh, Bahawalnagar and Dera Ghazi Khan in the Punjab and Ghotki, Sanghar, Khairpur and Nawabshah in Sindh (Annex-IV). These 14 districts, collectively account for 85 per cent of the total production of cotton in the country.

6. CHANGES IN AREA, YIELD AND PRODUCTION

45. During the period of 1992-93 to 2002-03, area under cotton in the country has ranged between 2.65 and 3.15 million hectares (6.55 to 7.78 million acres) and yield varied from 488 to 641 kgs per hectare. Cotton production during the period has oscillated between 8.04 and 11.24 million bales (Annex-II). Long and short term changes in area, yield and production of cotton are discussed below:

6.1 Long-Term Changes: 1992-93 to 2002-03

46. Cotton production at country level during 1992-93 to 2002-03 is estimated to have risen @ 2.1 per cent per year on account of 1.7 per cent yearly increase in yield and 0.4 per cent expansion in its area (Table-2).

Table-2: Average Annual Growth Rates of Area, Yield and Production of Cotton: 1992-93 to 2002-03

Country/Province	Area	Yield	Production
	---------- Per cent ----------		
Pakistan	(+) 0.4	(+) 1.7	(+) 2.1
Punjab	(-) 0.2	(+) 0.8	(+) 0.6
Sindh	(+) 2.5	(+) 6.2	(+) 8.8

Note: The growth rates have been worked out by estimating the equation $Y=a(1+r)^x$ through Ordinary Least Squares (OLS) method from the data given in Annex-II.

47. In the Punjab, cotton production during the period under reference has increased at the annual rate of 0.6 per cent, entirely due to rise of 0.8 per cent in yield as the area under cotton contracted @ 0.2 per cent per year.

48. In Sindh cotton production has registered a growth rate of 8.8 per cent per annum. This is attributable to 6.2 per cent annual rise in yield and 2.5 per cent expansion in area.

6.2 Short-Term Changes: 2002-03 Vs 2001-02

49. According to the Second estimates of Provincial Agriculture Departments, total production is estimated at 10 million bales. The crop harvest is 5.8 per cent less in comparison to the last year, which is entirely attributable to 12 per cent contraction in area as yield is up by 7.1 per cent (Table-3).

Table-3: Area, Yield and Production of Cotton: 2001-02 and 2002-03 Crops

Country/ Province	Area		Changes	Yield		Changes	Production		Changes
	2001-02	2002-03		2001-02	2002-03		2001-02	2002-03	
	000 hectares		Per cent	Kgs per hectare		Per cent	000 bales		Per cent
Pakistan	3115.8 (7699.1)	2742.9	(-) 12.0	579	620	(+) 7.1	10612.6	9995.5	(-) 5.8
Punjab	2526.4 (6242.7)	2155.7	(-) 14.7	542	587	(+) 8.4	8046.0	7445.0	(-) 7.5
Sindh	547.4 (1352.6	542.6	(-) 0.9	759	756	(-) 0.4	2443.2	2411.8	(-) 1.3
NWFP	1.6 (4.0)	4.0	(+)150.0	436	383	(-)12.2	4.1	9.0	(+)119.5
Balochistan	40.4 (99.8)	40.6	(+) 0.5	502	543	(+) 8.2	119.3	129.7	(+) 8.7

Note: Figures in parentheses are in thousand acres.
Source: Annexes II and III.

50. The cotton production in the Punjab during 2002-03, estimated at about 7,445 thousand bales, is 7.5 per cent short of previous year. The short crop is attributed to 14.7 per cent contraction in area as the yield has registered an improvement of 8.4 per cent.

51. Cotton production in Sindh during 2002-03 estimated at 2,412 thousand bales is 1.3 per cent less than the 2,443 thousand bales achieved in 2001-02. The fall in production is due to 0.9 per cent contraction in area and 0.4 per cent fall in yield.

52. Provincial Agriculture Departments have provided following reasons for changes in area in 2002-03 over 2001-02 crop:

1. Low prices of cotton received by the growers during 2001-02 crop year.
2. Discouragement of growers due to damage caused by insects, pests etc.
3. Shifting of area to other crops i.e. rice, sugarcane, moong and chillies which fetched better prices to the growers.

7. TARGETS VS ACHIEVEMENTS: 2002-03

53. The Federal Committee on Agriculture (FCA) had set the target of cotton production, for 2002-03 crop, at 10.07 million bales. As per Second estimates, production reported at 10 million bales is slightly (0.7 per cent) less than the target, primarily, because of under achievement in area (Table-4).

Table-4: Targets and Estimated Achievements of Area, Yield and Production of Cotton: 2002-03 Crop

Country/ Province	Area		Deviation from target	Yield		Deviation from target	Production		Deviation from target
	Target	Achieve-ment		Target	Achieve-ment		Target	Achieve-ment	
	000 hectares		Per cent	Kgs per hectare		Per cent	000 bales		Per cent
Pakistan	2900.0	2742.9	(-) 5.4	591	620	(+) 4.9	10070.0	9995.5	(-) 0.7
Punjab	2333.0	2155.7	(-) 7.6	576	587	(+) 2.0	7900.0	7445.0	(-) 5.8
Sindh	497.0	542.6	(+) 9.2	684	756	(+)10.5	2000.0	2411.8	(+) 20.6
NWFP	10.0	4.0	(-) 60.0	340	383	(+)12.5	20.0	9.0	(-) 55.0
Balochistan	60.0	40.6	(-) 32.3	425	543	(+)27.8	150.0	129.7	(-) 13.5

Sources:

1. For targets: Minutes of the 76th Meeting of FCA held on 03-04- 2002 at Islamabad.
2. For achievements: Annex-II.

54. The cotton production of 7.45 million bales in the Punjab is 5.8 per cent short of its target of 7.90 million bales. In Sindh, production reported at 2.41 million bales has exceeded the target by 20.6 per cent. In Balochistan, cotton production estimated at 129.7 thousand bales is 13.5 per cent short of the target, entirely due to 32.3 per cent under achievement in area.

8. DETERMINANTS OF SUPPORT PRICE

55. The following factors having a bearing on prices of seed cotton in Pakistan were analyzed for formulating price policy proposals for the 2003-04 crop.

8.1 Domestic supply, demand, stocks and price situation

8.2 Cost of production of seed cotton

8.3 Comparative economics of cotton and competing crops

8.4 Economics of fertilizer use on cotton

8.5 Nominal and real prices of seed cotton

8.6 World supply, demand, stocks, trade and price situation

8.7 Parity prices of seed cotton

8.7.1 Domestic

8.7.2 Export

8.7.3 Import

8.8 Economic efficiency in cotton production

8.1 Domestic Supply, Demand, Stocks and Price Situation

8.1.1 Domestic supply, demand and stocks

56. Data on domestic production, consumption, imports, exports and stocks of cotton (lint) for the years 2000-01 to 2002-03 are presented in Table-5.

Table-5: Domestic Production, Demand, Stocks of Cotton (Lint): 2000-01 to 2002-03 (August-July)

S.No.	Item	2000-01	2001-02	2002-03
		------- Million bales[a] -------		
1.	Opening stocks as on 1st August	2.53	2.34	2.42
2.	Production	10.73	10.61	10.00
3.	Imports	0.60	1.12	0.36[b]
4.	Total supplies (item 1+2+3)	13.86	14.07	12.78
5.	Consumption by:			
	5.1) Reporting mills	9.76	10.42	10.40
	5.2) Un-organized sector	0.50	0.50	0.50
	5.3) Non-mill sector	0.50	0.50	0.50
6.	Total consumption	10.76	11.42	11.40
7.	Exports	0.76	0.23	0.15[c]
8.	Total demand (item 6 + 7)	11.52	11.65	11.55
9.	Closing stocks as on 31st July (item 4-8)	2.34	2.42	1.23

Notes:

(a) One bale = 170 kgs = 375 lbs.
(b) Upto February 1, 2003.
(c) Upto February 7, 2003.

Sources:

1. MINFAL, Islamabad.
2. All Pakistan Textile Mills Association (APTMA), Punjab Zone, Lahore.
3. Karachi Cotton Association (KCA), Karachi.

57. As per details in Table-5, total availability of cotton during 2001-02 was 14.07 million bales. About 11.42 million bales were consumed domestically and exports totaled at 0.23 million bales, leaving end year stocks at 2.42 million.

58. According to the latest estimates, crop harvested in 2002-03 is reported at 10 million bales. Accounting for opening stocks and imports (upto 1st February 2003) total availability of cotton during the year works out to 12.78 million bales. The gross domestic consumption is estimated at 11.40 million bales while 0.15 million bales have been exported upto February 7, 2003. Thus, end year stocks may be around 1.23 million bales subject to the actual imports/exports during the rest of the year.

8.1.2 Price situation

8.1.2.1 Seed cotton (phutti) prices

59. Monthly average wholesale prices of seed cotton (phutti) ruling in the markets of Multan, Okara, Rahim Yar Khan, Vehari and Khanewal in Punjab and Mirpur Khas and Nawabshah in Sindh during the harvest/post harvest period (September to January) of the 2002-03 crop are given in Table-6.

Table-6: Monthly Average Wholesale Prices of Seed Cotton (Phutti) in the Main Producing Area Markets of the Punjab and Sindh: 2002-03 Crop (September to January)

Markets	September	October	November	December	January	Average
	---------- Rupees per 40 kgs ----------					
Punjab						
Multan	838	864	924	935	959	**904**
Okara	835	856	858	880	895	**865**
R.Y.Khan	860	898	941	928	911	**908**
Vehari	840	884	912	918	917	**894**
Khanewal	855	876	908	910	893	**888**
Average	**846**	**876**	**909**	**914**	**915**	**892**
Sindh						
Mirpur Khas	864*	868*	838*	763	775	**822**
Nawabshah	-	884	876	851	882	**873**
Average	**864**	**876**	**857**	**807**	**829**	**847**

Note: (-) Not available.
* Tando Allah Yar

Sources:
1. Directorate of Agriculture (E&M), Punjab, Lahore.
2. PCCC, Karachi.

60. The monthly wholesale prices of seed cotton (phutti) during current harvesting season in the Punjab ranged between Rs 835 per 40 kgs in Okara in September 2002 and Rs 959 per 40 kgs in Multan in January 2003. In Sindh, prices ranged between Rs 763 in Mirpur Khas in December 2002 and Rs 884 in Nawabshah in October, 2002. In the Punjab markets prices experiencing an upward trend overtime averaged around Rs 894 during the season in comparison to the support price of Rs 800 per 40 kgs. In Sindh markets cotton prices have also generally ruled above the support price.

8.1.2.2 Cotton (lint) prices

61. The daily spot rates of cotton (lint) are issued by Karachi Cotton Association (KCA) for "Base Grade" with staple length of 1-1/32" and micronaire value between 3.8 to 4.9 NCL (No Control Limit). Monthly average of spot prices of cotton (lint) at Karachi during August 2002 to February 2003 are presented in Table-7.

Table-7: Monthly Average Spot Prices of Cotton (Lint) at Karachi: 2002-03 Crop Season (August-February)

Month	Base grade-3, staple length 1-1/32", micronaire value between 3.8 to 4.9 NCL*
	Rupees per 40 kgs
August	2516
September	2466
October	2525
November	2595
December	2601
January	2588
February	2912

Notes:

* Prices include 15 per cent sales tax and expenses from up-country @ Rs 50 per 40 kgs.

Sources:

1. Karachi Cotton Association (KCA), Karachi.
2. Daily 'Dawn', Karachi

62. Table-7 shows that the lint prices averaged at Rs 2,516 per 40 kgs during August, 2002. In September, these remained depressed averaging at Rs 2,466. However, with the advancement of cotton season prices trended upward: averaging at Rs 2,525, 2,595 and 2,601 per 40 kgs in October, November and December, respectively. In January, 2003 although prices slightly declined but have improved sharply in February 2003.

8.2 Cost of Production

63. Cost of production is an important factor in the pricing of farm commodities. However, its empirical estimation involves a number of conceptual problems and practical difficulties. Wide variations in the use level of inputs, technology adoption and diverse farming systems resulting in varying yield levels further add to the problem.

64. The cost of production of seed cotton, for the 2003-04 crop, has been synthesized by adopting the physical input-out parameters as used in the 2002-03 Price Policy Report in conjunction with the latest inputs prices and rates of field operations. The prices of inputs and custom rates of field operation were obtained through a mini field survey conducted by the APCom, in the important cotton growing areas of the Punjab and Sindh during December, 2002. These rates were supplemented with the information provided by the participants in the meeting of the APCom's Standing Committee, held on 17th February, 2003 at Faisalabad. The COP estimates for the Punjab and Sindh are detailed in Annexes-V and VI and the results summarised in the Table- 8.

Table-8: Average Farmers' Cost of Production of Seed Cotton: 2002-03 and 2003-04 Crops

Item	Unit	2002-03 crop	2003-04 crop	Increase in 2003-04 over 2002-03
Punjab				
1. Cost of cultivation including land tax	Rs/acre	12697	13666	969
2. Yield	Kgs/acre	671	671	-
3. Cost of production at farm level	Rs/40 kgs	757	815	58
4. Marketing cost	"	14	15	1
5. Cost of production at market/ginnery	"	771	830	59
Sindh				
1. Cost of cultivation including land tax	Rs/acre	10323	10809	486
2. Yield	Kgs/acre	602	602	-
3. Cost of production at farm level	Rs/40 kgs	685	718	33
4. Marketing cost	"	14	15	1
5. Cost of production at market/ginnery	"	699	733	34

Source: Annex-V and VI.

Punjab

65. Raising one acre of cotton in the Punjab during 2003-04 crop year is expected to cost Rs 13,666, including land rent. With the average yield of 671 kgs per acre, the cost of producing seed cotton at farm level works out to Rs 815 per 40 kgs. Adding the marketing charges @ Rs 15, the market/ginnery level cost of seed cotton would come to Rs 830, higher by Rs 59 (8 per cent) than the previous year's corresponding cost estimated at Rs 771 per 40 kgs.

66. The important constituents in the cost of cultivation of seed cotton are: land rent (23 per cent), Plant protection (17 per cent), irrigation (13 per cent), chemical fertilizers (11 per cent), picking charges (9 per cent), land preparation (8 per cent), intercultural (5 per cent) and seed and sowing operations (5 per cent). The shares of various input/factor costs in the total cost are reflected in Figure-3.

Sindh

67. The likely expenses on cultivating one acre of cotton in Sindh for the 2003-04 crop are estimated at Rs 10,809 inclusive of land rent. Distributing these over the average yield of 602 kgs of seed cotton, the farm level cost of the produce comes to Rs 718 per 40 kgs. Adding marketing cost @ Rs 15 per 40 kgs, the cost of producing and delivering seed cotton at market/ginnery would be Rs 723 per 40 kgs. This reflects an increase of Rs 34 (5 per cent) over the corresponding cost for the 2002-03 crop.

68. The major components in the cost of cultivation of seed cotton in Sindh are: land rent (16 per cent), Plant protection (16 per cent), chemical fertilizers (14 per cent), picking charges (11 per cent), land preparation (10 per cent), intercultural (8 per cent), seed and sowing operations (7 per cent) and irrigation (5 per cent). The relative shares of these components are shown in Figure-4.

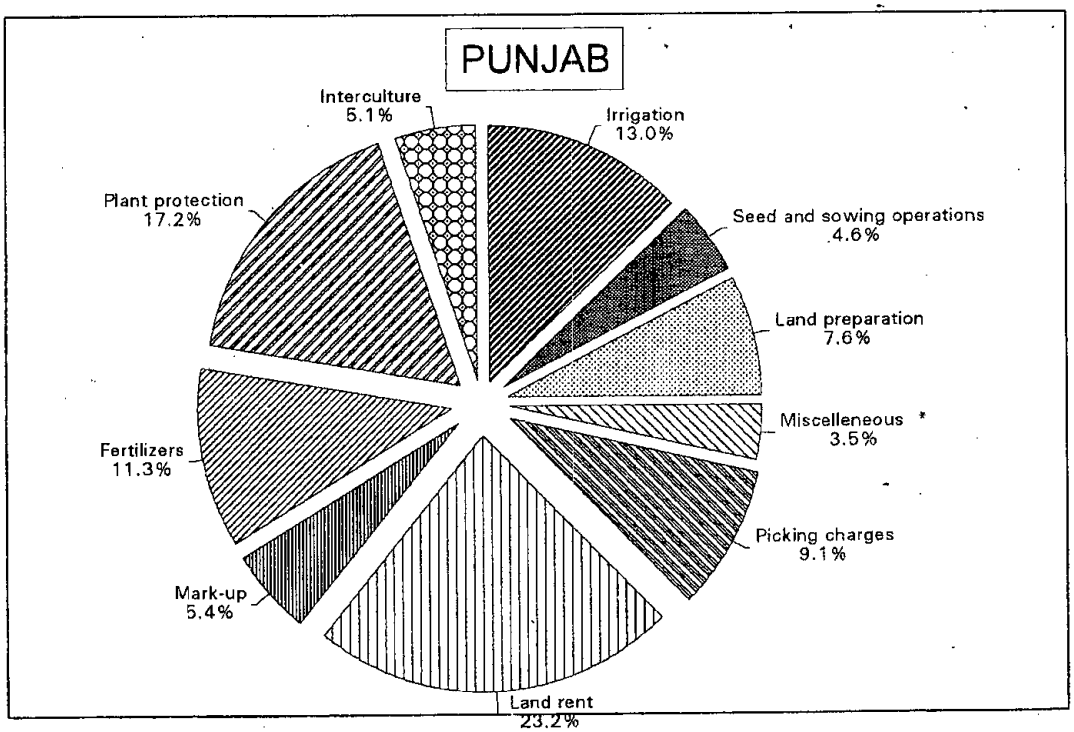

Figure-3: Structure of cost of cultivation of seed cotton in the Punjab: 2003-0
Note: * include charges for management, land revenue and cutting of sticks.

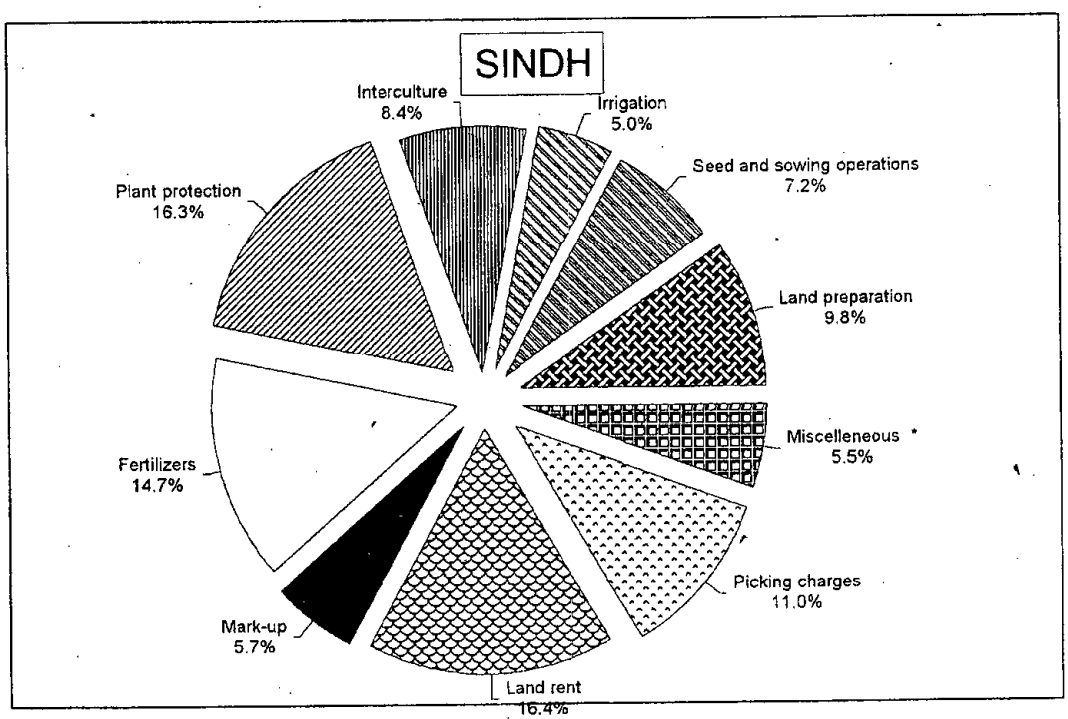

Figure-4: Structure of cost of cultivation of seed cotton in Sindh: 2003-04 cro
Note: * include charges for management, land revenue, cutting of sticks and drainage cess.

69. The increases in the production cost of seed cotton for the 2003-04 crop are primarily attributable to the higher costs of cultural operations and supplementary irrigation because of increases in the diesel prices and power tariff, higher cost of plant protection, rises in the prices of chemical fertilizers, picking charges and land rentals.

8.3 Comparative Economics of Cotton and Competing Crops

70. Resource allocation among competing enterprises is primarily governed by various economic considerations such as gross cost, gross income, gross margin, net income, output-input ratio, etc. The estimation of such indicators may provide useful insights into the pattern of resource use at farm level. These indicators are derived from farm management data and input-output prices which are subject to change over time and space. In addition, use of multiple criteria in understanding resource allocation behaviour of the farmers may provide conflicting signals, necessitating due care in interpretation of the results of such analysis.

71. Cotton, a kharif crop, competes with rice for land, water and other resources in those areas where the cultivation of both these crops is technically feasible. Cotton also faces indirect competition from sugarcane, an annual crop, which occupies the land throughout the year. In such a situation, combination(s) of kharif/rabi crops would have to be considered in analysing their comparative economics. The likely crop combinations in this context may be cotton+wheat, cotton+sunflower, rice+wheat and rice+sunflower.

72. The economics of cotton and competing crops has been analyzed in terms of input-output prices paid and received by the growers during the 2002-03 crop year.

73. The details of the analysis are presented in Annex-VII. A summary of economic indicators like output-input ratio and returns per day of crop duration, revenue per rupee of purchased inputs cost and per unit of irrigation water, for the Punjab and Sindh, is also provided in Table-9.

Punjab

74. The cotton growers have received remunerative prices of seed cotton during 2002-03 crop season. Resultantly, as reflected by various economic indicators, cotton farming has been an attractive proposition (Table-9). Cotton enjoyed a distinct edge over IRRI rice in respect of all the economic indicators, i.e. output-input ratio and returns to purchased inputs, crop duration and irrigation water. Cotton also outperformed basmati rice in terms of various economic criteria except gross revenue per day of crop duration; in which case the latter had a marginal edge.

Table-9: Economics of Cotton and Competing Crops at Prices Realized by the Growers: 2002-03 Crop Year

Province/crops/ crop combination	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of crop duration	acre-inch of irrigation water used
		---------- Rupees ----------		
Punjab				
1. Cotton	1.14	2.63	62.61	683.00
2. Rice – basmati	1.13	1.98	63.79	197.98
3. Rice – IRRI	0.90	1.62	43.94	127.58
4. Cotton + wheat	1.04	2.35	55.38	596.36
5. Cotton + sunflower	1.19	3.04	63.23	551.84
6. Sugarcane	0.96	2.97	43.03	353.23
Sindh				
1. Cotton	1.19	2.98	53.15	708.61
2. Rice – IRRI	1.02	2.23	41.33	132.86
3. Cotton + wheat	1.10	2.70	48.32	615.03
4. Cotton + sunflower	1.23	3.36	57.32	550.25
5. Sugarcane	1.01	2.58	43.08	296.11

Source: Annex-VII.

75. In case of indirect competition with sugarcane, cotton - sunflower rotation has a clear-cut edge over sugarcane in respect of all the economic indicators analyzed herein. The cotton-wheat rotation also out competes sugarcane in respect of all the economic criteria except returns to purchased inputs. One of the important factors in the poor economics of sugarcane was its low prices received by the farmers.

Sindh

76. In Sindh too, cotton farming had a distinct edge over rice farming in terms of returns to overall investment, purchased inputs, crop duration and irrigation water.

77. In case of indirect competition with sugarcane, both cotton - wheat and cotton - sunflower rotations had an edge over sugarcane in terms of all the indicators as farmers are reported to have received low prices of sugarcane in 2002-03.

8.4 Economics of Fertilizer Use

78. Chemical fertilizer is an important component of the technology package in modern farming. Its judicious use is critical in increasing crop production as well as productivity. The use level of fertilizers, of course, depends on the input-output price relationships, besides other factors. To assess the economic environment impacting on the use of fertilizers in cotton production, changes in the profitability of fertilizer use overtime as reflected in its benefit cost and the parity ratios between the prices of cotton and fertilizers for the period of 1992-93 to 2002-03 have been examined in the following section.

9.4.1 Benefit cost ratio

79. The benefit cost ratio for the use of fertilizers on cotton relates the values of additional produce on account of fertilizers and the expenses thereof, both direct and indirect. The value of the produce depends on the response of crop to fertilizer application and the prices of the produce. The response of the crop to fertilizer application depends upon a number of factors like variety, quality of seed, plant protection coverage, irrigation schedule, cultural practices etc. reflecting a wide variation in the actual situation. To account for the wide range of responses the BCRs have been estimated for a range of response ratios (seed cotton: fertilizer nutrient) i.e. 3.0:1, 3.75:1, 4.50:1 and 5.25:1 at the prices applicable for 2002-03 crop.

80. The details of the BCR calculations are given in Annex-VIII and the results summarized in Table-10 alongwith the BCRs for the previous 10 years (1992-93 to 2001-02).

Table-10: Benefit Cost Ratios (BCRs) of Fertilizer Use on Seed Cotton: 1992-93 to 2002-03

Year	Response Ratios (Seed Cotton: Nutrient) of			
	3.00:1	3.75:1	4.50:1	5.25:1
	---------- Benefit cost ratio ----------			
1992-93	3.22	3.83	4.38	4.89
1993-94	2.92	3.46	3.96	4.41
1994-95	4.34	5.15	5.88	6.55
1995-96	3.39	4.03	4.61	5.13
1996-97	3.05	3.62	4.13	4.60
1997-98	2.47	2.94	3.36	3.74
1998-99	2.66	3.15	3.60	4.00
1999-00	1.66	1.97	2.25	2.51
2000-01	2.51	2.96	3.35	3.71
2001-02	1.87	2.22	2.53	2.81
2002-03	2.07	2.46	2.81	3.13

Sources:

1. For 2002-03: Annex-VIII.
2. For 1992-93 to 2001-02: APCom's Support Price Policy Reports on Cotton.

81. A BCR equal to one would imply that the total value of the additional output equals the additional cost resulting in no profit/loss to the grower. Higher the value of BCR greater the profitability and vice versa

82. The data in Table-10 reveal that at the lowest response ratio of 3:1, BCR increased from 3.22 in 1992-93 to 4.34 in 1994-95. Afterwards it continued to decline and reached 1.66 during 1999-00. Similar trend has been observed in BCRs for higher response ratios. The most remunerative BCRs during 1994-95, at all response ratios, were the result of high prices of seed cotton in that year. However, this position could not be sustained in the following years. Having touched the lowest levels in 1999-00, resulting from low cotton prices, the situation, however improved in 2000-01 in the wake of rising prices of cotton. But as a result of sharp fall in cotton prices again the profitability of fertilizer use in cotton deteriorated in 2001-02. The BCRs ranging from 2.07 to 3.13 estimated at various response ratios for 2002-03 crop year reflect improvement in the profitability of fertilizer use on cotton which is attributable to the remunerative prices of seed cotton in the open market.

8.4.2 Parity ratio between prices of fertilizer and seed cotton

83. The ratio between prices of fertilizers and seed cotton indicate the quantity of seed cotton required to purchase a certain quantity of chemical fertilizers. A favourable ratio between prices of fertilizer and the crop should encourage its use. To ascertain whether the price relationship between the seed cotton and fertilizer is conducive towards judicious use of fertilizer, parity ratios between price of seed cotton received by the growers and that paid for fertilizers during the period of 1992-93 to 2002-03 were estimated and are given in Table-11.

Table-11: Parity Ratio Between the Prices of Fertilizer and Seed Cotton: 1992-93 to 2002-03

Crop Year	Sale Prices of		Market Prices of Seed Cotton	Quantity of Seed Cotton (phutti) needed to buy one nutrient tonne of	
	Nitrogen N	Phosphorous $P_2 O_5$		Nitrogen N	Phosphorous $P_2 O_5$
	----------Rupees per tonne----------			----------Tonnes---------	
1992-93	8996	7902	9675	0.93	0.82
1993-94	9130	8253	11875	0.77	0.69
1994-95	10174	11236	20500	0.50	0.55
1995-96	10348	13212	18325	0.56	0.72
1996-97	13478	19509	21225	0.64	0.92
1997-98	15870	19573	20825	0.76	0.89
1998-99	15217	19828	22675	0.67	0.87
1999-00	15217	24914	15500	0.98	1.61
2000-01	14130	22300	22700	0.62	0.98
2001-02	16960	24230	19150	0.89	1.27
2002-03	16760	24590	21875	0.77	1.12

Notes:

1. The nutrient prices of nitrogen (N) and phosphorous ($P_2 O_5$) have been worked out from the average sale prices of Urea and DAP as used in the COP estimates of the Punjab and Sindh in the support price policy for respective crop years.

2. Market prices are the average of monthly seed cotton prices which prevailed during the harvest season in important markets of the Punjab and Sindh as given in the respective Support Price Policy Reports.

84. As per data given in Table-11, quantity of seed cotton needed to buy one nutrient tonne of nitrogen during the period under review has fluctuated between 0.50 to 0.98 tonnes. The lowest ratio of 0.50, between the prices of nitrogen and those of seed cotton was observed in 1994-95 crop season. However, subsequently purchasing power of seed cotton in terms of fertilizers has declined as parity increased to 0.98 in 1999-00 due to disproportionate changes in the market price of urea and seed cotton. In the following year, 2000-01, parity ratio between prices of seed cotton and nitrogen improved in favour of the crop as only 0.62 units of seed cotton were required to pay for one unit of nitrogen. But in the aftermath of comparatively higher prices of urea and sharp decline in price of seed cotton, this situation could not be maintained in 2001-02. The parity ratio estimated for 2002-03 crop season (0.77) however, indicates an improvement of 13.5 per cent in the purchasing power of seed cotton.

85. In the case of phosphatic fertilizer also a trend similar to the one discussed above has been observed during the period under review. The parity between prices of phosphorus and seed cotton declined from 0.82 in 1992-93 to the minimum level of 0.55 in 1994-95, showing an improvement of 33 per cent in the purchasing power of seed cotton. However, this purchasing power could not be sustained in the following years due to opposite trends in the market prices of seed cotton and phosphate fertilizer. Resultantly, parity ratio in 1999-00 increased to 1.61, the highest during the period reviewed here which adversely affected purchasing power of cotton. During 2000-01, as prices of seed cotton improved the parity ratio improved in favour of cotton, which increased the purchasing power cotton by about 39 per cent in terms of phosphate fertilizers. However, there was a short deterioration in the parity ratio against cotton as its prices suffered a steep decline in 2001-02 crop season. In the wake of recovery in cotton prices in the current season the situation has same what improved over the previous year.

8.5 Nominal and Real Prices of Seed Cotton (Phutti) at Support and Market Prices: 1990-91 to 2002-03 Crops

86. The changes in the prices of a commodity in relation to the general price level in the economy impact on its purchasing power, welfare and real income of its producers. To estimate the overtime changes in the purchasing power of seed cotton (phutti), its nominal support and

market prices, from 1990-91 to 2002-03, were deflated by the Consumer Price Index (CPI), the most common measure of inflation in the economy. The results of the exercise are set out in Table-12 and also depicted in Figures-5 and 6.

8.5.1 Nominal and real support prices of seed cotton (phutti)

87. The nominal and real Support Prices of Seed Cotton (Phutti), 1990-91 to 2002-03, are set out in Table-12 and depicted in Figure-5.

88. As per data in Table-12, the nominal support price of seed cotton (phutti) during the period of 1990-91 to 2002-03 indicates a cumulative increase of 227 per cent i.e. from Rs 245 per 40 kgs in 1990-91 to Rs 800 per 40 kgs in 2002-03. During the same period, the CPI has risen by 151 per cent. Consequently, the real support price of seed cotton in 2002-03 crop year, estimated at Rs 319 per 40 kgs in 1990-91 rupees, showed an improvement of 30 per cent over corresponding price in 1990-91. However, in the intervening period the real value of the support prices of seed cotton have experienced many ups and downs as detailed below.

89. During the period of 1990-91 to 1994-95, the nominal support price of seed cotton (phutti) increased by 63 per cent while CPI rose by 53 per cent. As a result, the real support price of seed cotton (phutti) during this period increased by 7 per cent. In 1993-94, inspite of the 5 per cent raise in support price of seed cotton, the real value of support price fell to its lowest level of Rs 233 per 40 kgs. For 1995-96, the government did not revise the support price while CPI registered a rise of 11 per cent over the previous year and 69 per cent against the base year's level, resulting in 10 and 4 per cent loss in the real support price of seed cotton (phutti) as compared to that of 1994-95 and 1990-91 crops, respectively. In the wake of 25 per cent jump in the nominal support price in 1996-97 i.e. from Rs 400 to 500 per 40 kgs, its real value surged by 12 per cent. Again, in 1997-98, the support price of seed cotton was not increased while CPI rose by 8 per cent. Consequently, the real support price of seed cotton declined by 7 per cent as compared to that of 1996-97 crop

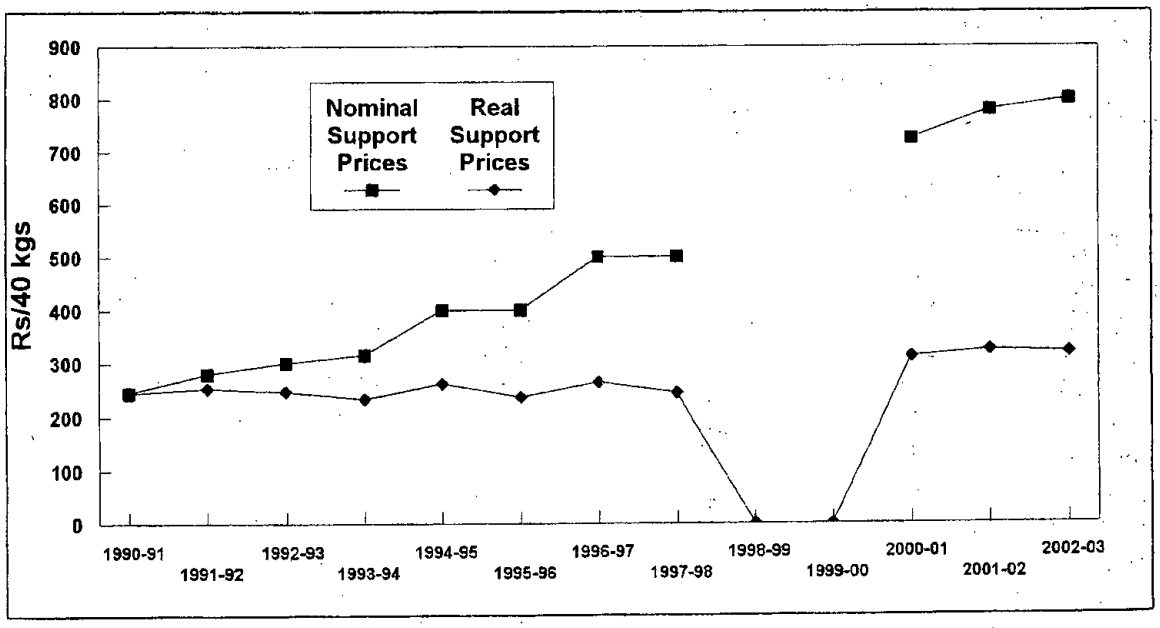

Figure-5: Nominal and Real Support Prices of Seed Cotton: 1990-91 To 2002-03

Note: The Support Prices of Seed Cotton (Phutti) for 1998-99 and 1999-00 were not fixed by the Government.

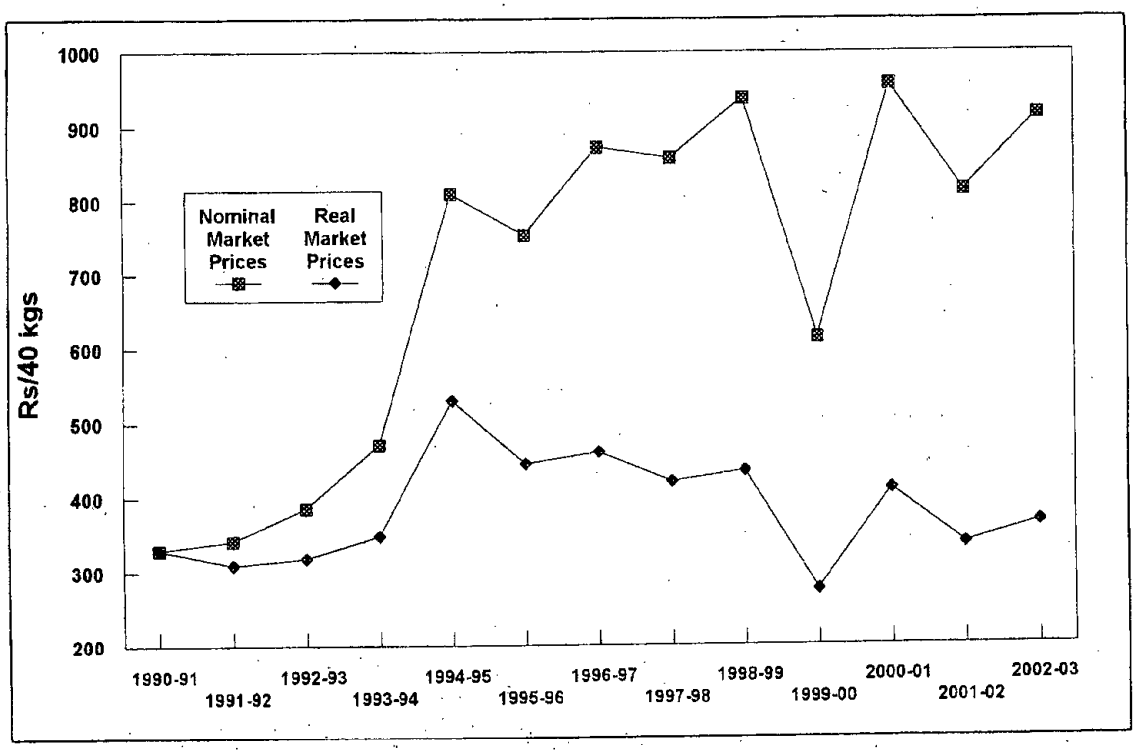

Figure-6: Nominal and Real Market Prices of Seed Cotton: 1990-91 To 2002-03

Table-12: Nominal and Real Prices of Seed Cotton (Phutti): 1990-91 to 2002-03

Crop year	Nominal prices		Consumer Price Index (CPI)	Real prices	
	Support	Market		Support	Market
	Rupees per 40 kgs		1990-91=100	Rupees per 40 kgs	
1990-91	245	330	100.00	245.00	330.00
1991-92	280	342	110.58	253.21	309.28
1992-93	300	386	121.45	247.02	317.83
1993-94	315	471	135.14	233.09	348.53
1994-95	400	810	152.73	261.90	530.35
1995-96	400	753	169.21	236.39	445.01
1996-97	500	872	189.18	264.30	460.94
1997-98	500	857	203.96	245.15	420.18
1998-99	-	936	215.66	-	434.94
1999-00	-	614	223.39	-	274.86
2000-01	725	957	233.24	310.84	410.31
2001-02	780	813	241.50	322.98	336.65
2002-03	800	921	250.77	319.02	367.27

Notes:

1. CPI for 2002-03 has been projected in view of the average rise in CPI during the last 3 years.
2. The support price of seed cotton (Phutti) used here relates to the group of most commonly grown varieties like, Niab-78, Niab-Krishma, CIM-240, Niab-86, FH-87,CRIS-9, CIM-109, Gohar-87, FH-682 and MNH-147 etc.
3. No support price was fixed for 1998-99 and 1999-00 crops.
4. The support price fixed for 2002-03 crop was for the base grade 3 with staple length 1-1/32" and micronaire range of 3.89 – 4.9 NCL (No control limit).
5. Market prices are the average monthly wholesale prices of Seed Cotton (Phutti) during October-January in Multan market.

Sources:

1. Agricultural Prices Commission (APCom), Islamabad.
2. Economic Survey of Pakistan (Statistical Supplement): 2001-02.
3. Directorate of Agriculture (Economics and Marketing), Punjab, Lahore.

90. For the next two crop years i.e. 1998-99 and 1999-00 the government did not fix any support price of seed cotton (phutti).

91. After two years interval in 2000-01, the support price of seed cotton (phutti) was fixed at Rs 725 per 40 kgs. Its real value in terms of 1990-91 rupees is estimated at Rs 310.84, the 3rd

highest level during the period under reference. For 2001-02 crop, the ECC of the Cabinet fixed the intervention price of seed cotton (phutti) at Rs 780 per 40 kgs, its real value, in terms of 1990-91 rupees, calculated at Rs 322.98, the highest level during the period under review, shows an improvement of 4 per cent over the previous year. The support price of seed cotton was increased from Rs 780 to Rs 800 per 40 kgs for 2002-03 crop, its real value in terms of 1990-91 prices is estimated at Rs 319.02, the 2nd highest level during the period under reference.

8.5.2 Nominal and real market prices of seed cotton (phutti)

92. The nominal and real market prices of seed cotton (phutti), from 1990-91 to 2002-03 are setout in Table-12 and depicted in Figure-6.

93. Table-12 reveals that the nominal market price of seed cotton (phutti) averaging at Rs 330 per 40 kgs during the picking season of 1990-91 crop has risen to Rs 921 per 40 kgs in the 2002-03, showing an overall increase of 179 per cent. During the same period, the CPI is estimated at 151 per cent. Consequently, the real value of market price of seed cotton (phutti) has surged from Rs 330 to Rs 367.27 per 40 kgs in 2002-03 in 1990-91 rupees, reflecting a rise of 11 per cent in real level of market price over the corresponding market price in 1990-91.

94. The market prices of seed cotton (phutti) experiencing a sharply rising trend during the period of 1990-91 to 1994-95, increased by 145 per cent. During this period, the cumulative inflation in terms of CPI was estimated at 53 per cent. As a result, the real market price of seed cotton (phutti) surged 61 per cent, touching the highest value of Rs 530 per 40 kgs during the period under report. During 1995-96 to 2001-02, nominal market prices of seed cotton (phutti) ranged between Rs 614 to Rs 957 per 40 kgs and their real value declined by 24 per cent. The market prices of seed cotton (phutti) during 2002-03 have averaged at Rs 921 per 40 kgs, reflecting 13 per cent increase over the last year's level while CPI has risen by 4 per cent. As a sequel, the real price of seed cotton (phutti) has surged by 9 per cent against the previous year in 1990-91 rupees.

8.6 World Supply, Demand, Stocks, Trade and Price Situation

8.6.1 World supply, demand, stocks and trade

95. The world balance sheet of cotton (lint) for the period, 2000-01 through 2003-04 is given in Table-13:

Table-13: World Production, Consumption, Stocks and Trade in Cotton: 2000-01 to 2003-04

S.No.	Item	2000-01 (Actual)	2001-02 (Estimated)	2002-03 (Projection)	2003-04 (Projection)
		----------Million tonnes----------			
1.	Opening stocks	9.51	9.23	10.38	8.81
2.	Production	19.48	21.52	19.30	20.76
3.	Total supply (1+2)	28.99	30.75	29.68	29.57
4.	Likely consumption	19.74	20.14	20.87	21.19
5.	Trade imbalance and stock adjustment*	+0.02	-0.23	0.00	0.00
6.	Closing stocks (3-4+5)	9.23	10.38	8.81	8.38
7.	Trade (exports)	5.81	6.44	6.45	6.61

Source: International Cotton Advisory Committee – "Report on Supply and Use/Distribution of Cotton", dated February 3, 2003.

* Trade imbalance i.e. difference in world imports and exports may exist due to inclusion of linter and waste, changes in weight during transit, difference in reporting periods and measurement error. Need for stock adjustment may arise due to difference between calculated stocks and actual ones.

96. Table-13 reveals that the world production of cotton during 2001-02 was estimated at 21.52 million tonnes, 2.04 million tonnes (10.5%) more than in 2000-01. Adding the opening stocks of 9.23 million tonnes, total supply in 2001-02 works out to 30.75 million tonnes, 1.76 million tonnes (6.1%) more than that of previous year. For 2002-03, production is projected at 19.30 million tonnes. Accounting for opening stocks of 10.38 million tonnes, total supply of cotton during 2002-03 should be 29.68 million tonnes, which is 1.07 million tonnes (3.5%) less as compared to that in 2001-02.

97. International Cotton Advisory Committee (ICAC) has projected production of cotton for 2003-04 to rise to 20.76 million tones and consumption to reach 21.19 million tones.

98. The global consumption of cotton was estimated at 20.14 million tonnes in 2001-02, i.e. 2 per cent higher than in 2000-01. For 2002-03, consumption projected at 20.87 million tonnes shows a further rise of 3.6 per cent.

99. End year stocks in 2001-02, estimated at 10.38 million tonnes are higher by 1.15 million tonnes (12.5%) than those in the previous year. For 2002-03, the closing stocks are, however, forecast to decrease to 8.81 million tonnes. Due to progressive trend in the world consumption the end year stocks are forecast to decline further in 2003-04 to 8.38 million tonnes.

100. World trade (exports) in cotton reported at 6.44 million tonnes in 2001-02 is forecast to marginally increase to 6.45 million tonnes in 2002-03 and to 6.61 in 2003-04.

8.6.2 International prices

101. The cif North Europe prices of Sindh/Punjab (Afzal 1-1/32″), Index-B Cottons and Orleans Texas (SLM 1-1-/32″) cotton for the period 1991-92 to 2002-03 are presented in Annex-IX and depicted in Figure-7.

102. The prices of Sindh/Punjab (Afzal 1-1/32″) averaging at US cents 58.23 per pound in 1991-92 declined to cents 53.95 in 1992-93. During 1993-94 to 1995-96, the prices registered an increasing trend and averaged at cents 82.17 during 1995-96, the highest level during the period under review. However, prices started declining in 1996-97 and averaged at cents 47.23 per pound during 1999-00. During 2000-01, prices recovered to average at cents 56.78. In 2001-02 prices once again declined and dropped to US cents 38.41 per pound, the lowest observed in many years. During the current cotton year prices have improved and averaged at US cents 47.40 per pound (August-January).

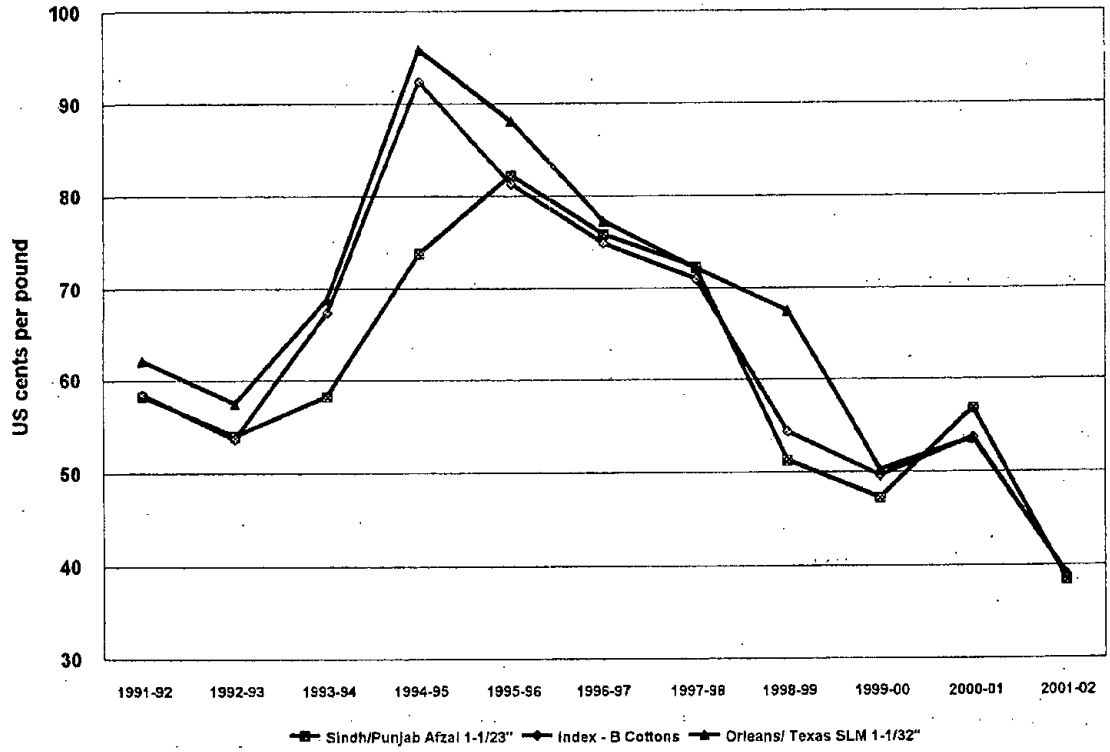

Figure-7: CIF NORTH EUROPE PRICES OF VARIOUS COTTONS: 1991-92 TO 2001-02

103. The cif value of Index-B cotton and prices of Orleans Texas Strict Low Middling 1-1/32" have shown a pattern similar to the one explained above for Pakistani cotton, Sindh/Punjab (Afzal 1-1/32"). The prices averaging at 58.44 and 62.06 cents respectively in 1991-92, touched their highest levels, 81.19 and 88.02 cents per pound in 1995-96. During 1996-97, the average prices had declined to 74.85 and 72.22 cents. The downward trend continued upto 1999-00 when the values of Index B and Orleans Texas, SLM cottons dropped to 49.55 and 50.19 cents respectively. Recovering in 2000-01 prices of Index B cottons averaged cents 53.70 and that of Orleans Texas 53.57 cents per pound. Nevertheless prices again dropped in 2001-02 and reached their lowest levels of 38.95 and 39.05 cents during the period. During the current season i.e., August to January 2002-03, prices have improved and averaged at cents 47.93 and 47.76 per pound, respectively.

8.7 Parity Prices of Seed Cotton

8.7.1 Domestic parity price

104. A substantial proportion of cotton production is domestically processed into yarn by the spinning mills for domestic use and exports. Therefore, domestic prices of yarn can provide a useful reference for working back the price of its raw material (i.e. cotton and seed cotton). The prices of cotton yarn (21's) in Karachi market during the months of August 2002 through January 2003 averaging at Rs 419 per bundle of 4.54 kgs have been used to work back the price of seed cotton. Accounting for various costs involved in processing cotton into yarn viz, conversion charges from lint into yarn, sales tax, storage and transportation charges, ginning charges and recoveries from sale of cotton waste and cotton seed, price of seed cotton works back to Rs 811 per 40 kgs. Details may be seen in Annex-X.

8.7.2 Export parity prices

105. The main objective of calculating the export parity prices is to asses the competitiveness of a commodity in the export markets. As Pakistan is one of the major exporters of cotton/yarn, export parity prices of seed cotton have been worked back on the following bases.

Actual Average export prices of Pakistani cotton during:

- 2002-03 (Aug-Dec)
- 1997-98 to 2001-02

Average cif North Europe value of Index-B cotton during

- 2002-03 (Aug-Jan)
- 1997-98 to 2001-02

Average cif North Europe quotations of Pakistani Afzal 1-1/32" during:

- 2002-03 (Aug-Jan)
- 1997-98 to 2001-02

Futures contract prices of New York No.2 cotton during:
October, December, 2003 and March 2004

Average fob prices of Pakistani cotton yarn (20's) during:

- 2002-03 (Aug-Jan)
- 1997-98 to 2001-02

8.7.2.1 Based on actual average export prices of Pakistani cottons:

- **During 2002-03 (Aug-Dec)**

106. The fob (Karachi) prices of Pakistani cotton during 2002-03 (Sept-Dec) averaged at US cents 36 per pound. Applying the existing buying exchange rate of one US $ 58.01 Pak rupees, the fob (Karachi) price in terms of Pak rupee comes to Rs 1,842 per 40 kgs. Accounting for the various expenses i.e. export and purchase incidental, insurance & financial charges @ Rs 200 per 40 kgs, the ex-gin price of cotton (lint) works back to Rs 1,642 per 40 kgs. Adding recovery of Rs 814 from sale of 80 kgs of cotton seed and subtracting ginning charges of Rs 250 for 120 kgs of seed cotton, the price of 120 kgs of seed cotton at ginnery level works back to Rs 2,206 or Rs 735 per 40 kgs. For detail see Annex-XI.

- **During 1997-98 to 2001-02**

107. The fob (Karachi) price of cotton has averaged at US cents 50 per pound for the period 1997-98 to 2001-02. Adopting procedure as discussed above, the economic price of seed cotton at ginnery works out to Rs 974 per 40 kgs (Annex-XI).

8.7.2.2 Based on average cif North Europe value of Index 'B' Cottons:

- **During 2002-03 (Aug-Jan)**

108. The cif North Europe value of Index B* cottons during 2002-03 (Aug-Jan) averaged at US cents 47.93 per pound. Subtracting the freight charges @ US cents 5.50 per pound, insurance, agents commission and port handling charges @ 4% of export price (US cents 1.70 per pound), the net export price of lint at Karachi port comes to US cents 40.73 per pound. Adopting this as a reference price for Pakistani cotton exports and using the existing buying exchange rate of one US $ = 58.01 Pak rupees, the cost of cotton (lint) at Karachi calculates to Rs 2,084 per 40 kgs. After accounting for various expenses involved in marketing and exports as detailed earlier, ex-gin price of cotton comes to Rs 1,884 per 40 kgs. After accounting for sale proceeds of cotton seed Rs 814 ginning charges of Rs 250, economic price of 120 kgs of seed cotton works back to Rs 2,448 or Rs 816 per 40 kgs (Annex-XII).

- **During 1997-98 to 2001-02**

109. The value of Index B cotton at North European ports during the period of 1997-98 to 2001-02 averaged at 53.50 cents per pound. Adopting this as a proxy for Pakistani cotton and following the steps and procedure as discussed above, the economic price of seed cotton at ginnery level in Pakistan works back to Rs 907 per 40 kgs (Annex-XII).

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* Index-B is the average of the cheapest 3 cottons of Orleans/Texas SLM 1-1/32", Brazilian Type 5/6, 1-1/16"; Argentine Grade C – ½, 1-1/16"; Turkish Adna St. 1 White, 1-1/16"; RG, Central Asian, SLM 1-1/16"; Pakistani Sindh/Punjab SG Afzal 1-1/32"; Indian J-34 SG and Chinese, Type 527.

8.7.2.3 Based on average cif North Europe Quotations of Pakistani cotton, Afzal 1-1/32"

- **During 2002-03 (Aug-Jan)**

110. The cif North Europe quotations for Pakistani Afzal 1-1/32" cotton during the period of 2002-03 (Aug-Jan) have averaged at US cents 47.40 per pound*. Deducting the freight charges @ 5.50 cents per pound, insurance, agents commission and port handling charges @ 4% of export price (1.68 cents per pound), the net export price of lint at Karachi port comes to US cents 40.22 per pound or Pak Rs 2,058 per 40 kgs at the current exchange rate of one US $ to 58.01 Pak rupees. Accounting for the marketing expenses of Rs 200 per 40 kgs as detailed above, the ex-gin price of lint would come to Rs 1,858 per 40 kgs. Adding recovery of Rs 814 from the sale of 80 kgs cotton seed and subtracting ginning charges of Rs 250 per 120 kgs of seed cotton, the ex-gin economic price of seed cotton works back to Rs 807 per 40 kgs. Details may be seen in Annex-XIII.

- **During 1997-98 to 2001-02**

111. The cif North Europe quotations for Pakistan Afzal 1-1/32" cotton during the period of 1997-98 to 2001-02 have averaged at US cents 53.20 per pound. Adopting the procedure as mentioned above, the ex-gin economic price of seed cotton comes to Rs 902 per 40 kgs (Annex-XIII).

8.7.2.4 Based on future contract prices of New York No.2 cotton

112. The future prices of New York No.2 cotton for the deliveries in October, December, 2003 and March 2004, as quoted in Cotton Outlook dated January 31, 2003, average at 58.67 cents per pound. Accounting for the grade and staple discounts and inland transportation charges, the equivalent prices for Pakistani cotton at Karachi works back to 48.07 cents per pound or Rs 2,459 per 40 kgs at the current exchange rate of one US $ 58.01. Accounting for the export

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* This average price is 11 cents higher than the actual average export price of Pakistani cotton. This difference may be due to the following: (i) the latter price is the average price of all varieties exported including inferior products whereas the former is meant for Sindh/Punjab Afzal 1-1/32" only (ii) prices quoted for exports are generally higher than those at which actual transaction are made (iii) under invoicing is involved.

expenses, value of cotton seed and ginning charges as detailed earlier, the economic price of seed cotton calculates to Rs 941 per 40 kgs (Annex-XIV).

8.7.2.5 Based on average fob price of Pakistani cotton yarn (20's):

- **During 2002-03 (Aug-Jan)**

113. The fob price of Pakistani cotton yarn (20's) during 2002-03 (Aug-Jan) has averaged at US cents 155.00 per kg or Rs 90 per kg. Accounting for the fob expenses including transport cost, wharfage, port handling and forwarding, adhesive and export development surcharge (EDS) @ Rs 2 per kgs, cost of export packing @ Re 1 per kg, recovery from sale of 0.16 kgs of cotton waste @ Re 1 per kg, conversion charges of lint into yarn @ Rs 30 per kg, transport cost from ginnery to mill @ Rs 40 per 40 kgs, value of cotton seed @ Rs 814 and ginning charges @ Rs 250 per 40 kgs, the economic price of seed cotton at ginnery level works back to Rs 840 per 40 kgs. Details may be seen in Annex-XIV.

- **During 1997-98 to 2001-02**

114. The fob price of Pakistani cotton yarn (20's) during 1997-98 to 2001-02 averaged at US cents 195.70 per kg or Rs 114 per kg. Adopting the procedure mentioned earlier the economic price of seed cotton at ginnery level works back to Rs 1007 per 40 kgs. Details may be seen in Annex-XIV.

8.7.3 Import parity prices

115. Calculation of import parity prices for a commodity is helpful in assessing opportunity cost of resources used in its domestic production. As Pakistan has been importing cotton in recent years, its import parity prices have also been worked back as per following bases.

Average cif North Europe quoted prices of Orleans/Texas Middling 1-1/32" during:
- 2002-03 (Aug-Jan)
- 1997-98 to 2001-02

Actual average cif (Karachi) prices of imported cotton during:
- 2002-03 (Aug-Dec)
- 1997-98 to 2001-02

8.7.3.1 Based on average cif North Europe Quotations of Orleans/Texas Middling 1-1/32" SLM

- **During 2002-03 (Aug to Jan)**

116. The average cif North Europe quotations of Orleans/Texas Strict Low Middling (SLM) 1-1/32" during 2002-03 (Aug-Jan) averaged at US Cents 47.76 per pound. Adding freight charges @ US cents 5.50 per lb and forwarding charges @ US cents 0.72 per pound, insurance charges, agents commission and port handling charges @ 0.81 US cents per pound, the landed cost at Karachi comes to US cents 54.79 per pound or Rs 2,812 per 40 kgs. Adding handling charges at port and transport cost from port to textile mill at Karachi @ 2.5 per cent of cif price (Rs 70), the ex-gin price of lint cotton calculates to Rs 2,883. After adding the value of 80 kgs cotton seeds i.e. Rs 814 and subtracting the ginning charges @ Rs 250, the economic price of seed cotton works out to Rs 1,149 per 40 kgs. Details may be seen in Annex-XV.

- **During 1997-98 to 2001-02**

117. The cif price of North Europe quotations of Orleans/Texas, Strict Low Middling (SLM) 1-1/32" during 1997-98 to 2001-02 averaged at US cents 56.43 per pound. Adopting the procedure as mentioned above, the economic price of seed cotton at ginnery level works back to Rs 1,306 per 40 kgs (Annex-XV).

8.7.3.2 Based on actual average cif (Karachi) price of imported cotton during:

- **During 2002-03 (August-December)**

118. The actual cif (Karachi) price of imported cotton during 2002 (Aug to Dec) has averaged at Rs 2,775 per 40 kgs. Accounting for the incidentals from Karachi port to mills and from mills to ginneries, the ex-gin price of cotton lint calculates to Rs 2,844 per 40 kgs. Further, adjusting for the values of cotton-seed and ginning charges, the economic price of seed cotton works out to Rs 1,136 per 40 kgs. Details may be seen in Annex-XVI.

- **During 1997-98 to 2001-02**

119. The actual cif (Karachi) price of imported cotton during 1997-98 to 2001-02 averaged at Rs 3,067 per 40 kgs. Adopting the above mentioned procedure the economic price of seed cotton works back to Rs 1,236 per 40 kgs. Details may be seen in Annex-XVI.

8.8 Economic Efficiency in Cotton Production

120. In view of the economic importance of cotton, the Commission has attempted to ascertain the efficiency of resource use in its production by estimating its nominal protection coefficient (NPC), effective protection coefficient (EPC), and domestic resource cost coefficient (DRC), the most commonly used parameters in this context. These coefficients are summarized in Table-14 while details of estimation are given in Annexes–XVII and XVIII.

8.8.1 Nominal Protection Coefficient (NPC),

121. NPC is estimated by dividing domestic prices with border prices (import / export parity prices) and measures the impact of output pricing policies without taking into consideration the distortions in input markets. The NPC if greater than one indicates that domestic producers are getting higher than the economic price for their produce which should encourage domestic production of the commodity. In case the NPC is less than one, domestic producers are getting less than the economic prices implying implicit taxation of the domestic production / producers.

8.8.2 Effective Protection Coefficient (EPC)

122. Effective protection coefficient is the ratio between the value added in producing a commodity at private prices and at social prices. Unlike the NPC, which ignores the distortions in the input markets, EPC also takes into account the impact of policy interventions in the input markets. Thus, it is a more meaningful measure for analyzing the protection/taxation of a given sector/commodity.

123. EPC of greater than one means that private profit in production is higher than it would be without government interventions in input - output markets. The coefficient of less than one indicates the opposite i.e. net effect of Government policies is to reduce private profits which discourages domestic production.

8.8.3 Domestic Resource Cost (DRC)

124. Domestic resource cost (DRC) indicates the opportunity cost of domestic resources used per unit of the value added in the production of a commodity. The numerator in these calculations is the opportunity cost of non-tradable factors used in domestic production while denominator is the value addition calculated at social prices. DRC coefficient of greater than one indicates a "comparative disadvantage" in domestic production as the cost associated with its domestic production is greater than the economic cost of corresponding imports. A situation where domestic resource cost coefficient is less than one implies "comparative advantage" in domestic production as it can save/generate foreign exchange at costs less than the corresponding cost of imports. It may, however, be pointed out that DRC would vary with the changes in the opportunity cost of non-tradable inputs as well as the border prices of outputs and inputs. Technological changes in production technology resulting in productivity improvements should have a salutary effect on the domestic resource cost, holding other factors constant.

125. In view of the fluctuations in the domestic production and growing requirements, and shifts in policy, the country has exported as well as imported cotton in recent years. Therefore, the efficiency analysis has been carried out under both importing and exporting scenarios. These estimations are based on the cost of production of seed cotton as used by the Agricultural Prices Commission in its Support Price Policy Reports. To ascertain the impact of overtime changes in input-output prices on the efficiency of cotton production, the analysis has been carried out at the input-output prices relevant for the 1999-00 to 2002-03 crops.

126. NPCs, EPCs, and DRCs are important tools for ascertaining the performance of any commodity system/sector and changes overtime. These coefficients may vary significantly even in short periods of time due to changes in commodity price and exchange rates, which impact on border prices. Thus, the same domestic price can be highly protectionist in one year and otherwise in the next. Similarly, the empirical results are sensitive to changes from export parity to import parity situation as this makes a lot of difference in the relevant social prices.

- **Results of Empirical Analysis**

127. Two sets of NPCs and EPCs, based on export and import parity prices of cotton, are given in Table-14.

Table-14: Economic Efficiency Coefficients for Seed Cotton (Average Farmers)

Province/Year	NPCs	EPCs	DRCs	Cost of domestic resources to earn/save forex of one $
	Based on export parity prices			Rupees per US $
Punjab				
1999-00	0.99	0.93	0.82	47.56
2000-01	1.08	1.07	0.61	35.38
2001-02	1.21	1.19	0.94	54.52
2002-03	0.94	0.82	0.58	33.64
Average prices	1.04	0.94	0.80	46.40
Sindh				
1999-00	1.02	0.98	0.77	44.66
2000-01	1.05	1.03	0.55	31.90
2001-02	1.21	1.19	0.82	47.56
2002-03	0.88	0.78	0.53	30.74
Average prices	1.03	0.94	0.70	40.60
	Based on import parity prices			
Punjab				
1999-00	0.53	0.38	0.34	19.65
2000-01	0.79	0.70	0.40	23.19
2001-02	0.68	0.53	0.42	24.19
2002-03	0.79	0.65	0.46	26.87
Average prices	0.69	0.54	0.46	26.33
Sindh				
1999-00	0.54	0.41	0.33	18.90
2000-01	0.77	0.68	0.36	21.09
2001-02	0.68	0.55	0.38	22.23
2002-03	0.74	0.62	0.42	24.59
Average prices	0.68	0.55	0.42	24.11

Source: Annexes-XVII and XVIII.

128. During 1999-00 and 2000-01, the NPCs estimated at export parity prices were either less than one or quite close to one, indicating that domestic prices of seed cotton were quite close to the border prices. However, in 2001-02 as the cotton prices in the international market steeply declined the estimates of NPCs became significantly (20 to 21 per cent) higher than one as domestic prices, which also fell sharply but ruled higher than the corresponding border prices. In the wake of recovery of cotton prices in the international market in 2002-03, though still ruling much below their long-term trend, the domestic prices also recovered. However, inspite of marked improvement over previous year, domestic prices were 6 to 7 per cent less than the border prices.

129. Although the domestic prices in sympathy with the world markets have fluctuated during the period of analysis, nevertheless fluctuations in international prices have been much more pronounced, changing the situation of taxation of cotton production to its subsidization and vice versa.

130. In view of the substantial imports of cotton to cater for the demand of the burgeoning textile sector, the NPCs / EPCs have also been calculated at import parity price. The estimated co-efficients under this scenario are consistently and substantially less than one. There is a substantial difference between the NPCs / EPC calculated at export parity prices and at the import parity prices. In view of foregoing situation, it needs to be emphasized that the industry would have to pay much higher prices to meet their requirement of raw-material, if the country is unable to produce sufficient amount of cotton domestically.

131. The results of EPCs calculations also corroborate the inferences drawn from the estimates of NPCs.

- **DRCs**

132. As mentioned earlier, DRCs indicate a commodity system having a comparative advantage or disadvantage situation. The results of the analysis (Table-14) indicate that DRCs have been much less than one during the period covered (1999-2000 to 2002-03), both under exporting and importing country scenarios. Thus, Pakistan has comparative advantage in cotton production. Based on the last 4 years' average prices, DRCs have been estimated at 0.8 for the Punjab and 0.70 for Sindh, implying that cost of domestic resources involved in earning one US dollar through cotton exports is 20 and 30 percent, respectively, less than the current exchange rate. Accordingly, increasing cotton production even with the existing production technology for exports is an economic proposition.

133. DRCs calculated under importing scenario (Table-14) are much lower than those discussed under exporting scenario. This phenomenon is also termed as saving of foreign exchange. The numerics indicates that cost of domestic factors involved in saving one unit of foreign exchange was only 33-34 percent of its market price in 1999-2000, 36 to 40 percent in 2000-01, 38 to 42 percent in 2001-02 and 42 to 46 percent in 2002-03. Based on 4 years average prices cost of domestic resources required to save one unit of foreign exchange has been

estimated at 42 – 45 percent of the actual market value of foreign exchange. Thus expansion in production of cotton in the country for import substitution is highly cost effective.

9. THE SUPPORT PRICE

134. Based on the analysis of different domestic and international factors, the options about domestic cotton prices of seed cotton are summarized as under:

	Base	Worked back price of seed cotton at ginnery level Rupees per 40 kgs
1	Domestic parity price of yarn at Karachi (Annex-X)	811
2	Export parity prices based on:	
	i) Actual average export price of Pakistani cotton: (Annex-XI)	
	- During 2002-03 (Aug-Dec)	735
	- During 1997-98 to 2001-02	974
	ii) Average cif (North Europe) value of Index-B cottons: (Annex-XII)	
	- During 2002-03 (Aug-Jan)	816
	- During 1997-98 to 2001-02	907
	iii) Average cif (North Europe) quotations of Afzal 1-1/32": (Annex-XII)	
	- During 2002-03 (Aug-Jan)	807
	- During 1997-98 to 2001-02	902
	iv) Futures contract prices of New York No.2 cotton (average of October 2003, December 2003 and March 2004) (Annex-XIII)	941
	v) Average fob prices of Pakistani cotton yarn (20's): (Annex-XIV)	
	- During 2002-03 (Aug-Jan)	840
	- During 1997-98 to 2001-02	1,007
3	Import parity prices based on:	
	i) Actual average cif (North Europe) quotations of Orleans/ Texas SLM 1-1/32" (Annex-XV)	
	- During 2002-03 (Aug-Jan)	1,149
	- During 1997-98 to 2001-02	1,306
	ii) Cif Karachi prices of imported cotton: (Annex-XVI)	
	- During 2002-03 (Aug-Jan)	1,136
	- During 1997-98 to 2001-02	1,236
4	Real support price in 2002-03	831
5	Average domestic market price of seed cotton in 2002-03 (September-January) (Table-6)	870
6	Cost of production for 2003-04 crop	
	Punjab (Annex-V)	830
	Sindh (Annex-VI)	733

135. The price of seed cotton worked back from the domestic price of cotton yarn at Karachi during the current season has been calculated at Rs 811 per 40 kgs against the monthly average market prices ranging between Rs 763 to 959 per 40 kgs during September 2002 and January 2003.

136. The world production of cotton in 2002-03 is projected at 19.30 million tones, 11.5 per cent less than previous year. The end year stocks are estimated to decline to 8.81 millions from the opening stocks of 10.38 million tones. The international prices of cotton have risen significantly. The average price of Sindh/Punjab (Afzal 1-1/32") as recorded at US cents 38.61 per pound during 2001-02 has increased to 47.78 cents per pound in the current year (August-January). The international prices are projected to rise during the year.

137. The worked back export parity prices of seed cotton when calculated from actual average export prices of Pakistani cottons, cif North Europe value of Index-B and Sindh/Punjab Afzal 1-1/32" cotton during 2002-03 range between Rs 735 and 816 per 40 kgs. The prices of seed cotton when worked back from their respective average for 1997-98 to 2001-02, ranged between Rs 902 and 974 per 40 kgs. Similarly, the worked back price of seed cotton from the futures contract price of New York No.2 cottons (average of October 2003, December 2003 and March 2004) comes to Rs 941 per 40 kgs.

138. The prices of seed cotton as estimated from the average fob prices of cotton yarn (20's), work back to Rs 840 per 40 kgs using the average of 2002-03 and to Rs 1,007 per 40 kgs when based on the average export price of 1997-98 to 2001-02.

139. The import parity price of seed cotton at ginnery level, based on cif North Europe quotations of Orleans/Texas SLM 1-1/32" during August 2002 to January 2003, comes to Rs 1,149 and in case of quotations during 1997-98 to 2001-02 comes to Rs 1,306 per 40 kgs. When the import parity prices are worked back from the actual average cif (Karachi) price of imported cotton, it come to Rs 1,136 and Rs 1,236 per 40 kgs for these two periods.

140. Against the support price of Rs 800 per 40 kgs of seed cotton, the average monthly market prices in Punjab markets ranged from Rs 835 to Rs 959 during September 2002 and January 2003. The prices in Sindh markets also ruled above the support price during this period except in Mirpur Khas market where these were recorded at Rs 763 and Rs 775 in December 2002 and January 2003, perhaps because of the inferior quality of the produce at the fag end of the season. During the current season, the overall average of market price stood at Rs 870 per 40 kgs.

141. The real support price of seed cotton in 2002-03, in terms of 1990-91 rupees, has improved to Rs 319 per 40 kgs against Rs 245 in 1990-91, while the real value of market price in 2002-03, in terms of 1990-91 rupees comes to Rs 365 against Rs 330 per 40 kgs in 1990-91. During 2002-03, CPI is expected to rise by 3.8 per cent over 2001-02. On this basis, equivalent support price should be Rs 831 per 40 kgs.

142. The cost of production (COP) of seed cotton at ginnery level for the 2003-04 crop is estimated at Rs 830 per 40 kgs for Punjab and Rs 733 per 40 kgs for Sindh. These estimates are 8 and 5 per cent higher than the corresponding estimates of the previous year. These estimates reflect increases of Rs 34 and 59 in case of Sindh and Punjab respectively.

143. Keeping in view the developments in the domestic and international markets as summarized above, and the changes in cost of production, there is a case for increase in the support of seed cotton by Rs 50 per 40 kgs or so. Although the analysis of export parity prices as well as import parity prices warrant a much higher increases of Rs 100 - 400 per 40 kgs, yet these trends should be better left to the market as support price is not meant to replace the market determined prices but provide a floor to the market. Pakistan has comparative advantage in cotton production and some moderate increase in the support price is necessary to keep the interest of the growers in its farming. Thus, APCom recommends that support price of seed cotton for the 2003-04 crop be fixed at Rs 850 per 40 kgs.

144. The TCP is recommended to be assigned the task of implementing the support price of seed cotton. Since the support price for seed cotton is implemented through procuring the cotton

lint, the price of lint be fixed accordingly. TCP should also enforce the premia and discounts for various grades, staple lengths and micronaire levels as given in the section on Payment of Quality Premium of the Report in Tables-18 and 19.

10. PAYMENT OF QUALITY PREMIUM

145. Previously, the support prices of seed cotton used to be fixed on the basis of variety. But over time in cotton pricing/marketing its grade, as determined by staple length, micronaire, etc. has replaced variety. Since 1-7-2000, the KCA is also announcing spot prices of lint on the basis of its grade, staple length and micronaire. The ECC of the Cabinet has also been fixing the support price of seed cotton (phutti) for base grade 3 with staple length 1-1/32" and micronaire range from 3.8 – 4.9 NCL w.e.f 2001-02 season. For 2002-03 crop, the ECC in its meeting held on 11.7.2002 fixed support price for seed cotton (phutti) for "base grade-3" at Rs 800 per 40 kgs. The premium/discount rates for higher/lower quality grades and staple length were approved as given in Table-15. The ECC also directed that the premia and discounts as announced by KCA every week for lint should be enforced by TCP in its market operations.

Table-15: Grade and Staple Margins for Seed Cotton

Grade	Staple length				
	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8".
	---------- Rupees per 40 kgs ----------				
Super	25	42	59	76	94
One	10	28	45	62	80
Two	-2	16	33	50	67
Three	-17	Base	17	34	51
Four	-35	-18	-1	16	34
Five	-53	-36	-19	-2	16

Note: Calculated at the base price of Rs.780 per 40 kgs

146. Nevertheless, it is a matter of concern that in actual practice these premia/discounts are seldom adhered to and benefits of the scheme are rarely passed on to the growers.

147. Now Pakistan Cotton Standards Institute (PCSI) has revised premium/discount rates for various grades of seed cotton based on support price of Rs 800/- per 40 kgs. These rates are calculated by using the following formula and are given in Table-16.

$$\text{Premium/Discount} = \frac{\text{Support Price x Technical Differential}}{300}$$

Table-16: Premia/Discounts for Various Grades of Seed Cotton

Grade	Lint technical differentials	Premia/discounts Rs per 40 kgs
Super	10.70	800 x 10.70/300 = + 28.53
One	7.13	800 x 7.13/300 = + 19.01
Two	3.95	800 x 3.95/300 = + 10.53
Three	Base	Base
Four	4.66	800 x 4.66/300 = - 12.42
Five	9.25	800 x 9.25/300 = - 24.66

Source: Pakistan Cotton Standards Institute, Karachi.

148. Incorporating the above margins with those of KCA on staple length i.e. the premia discounts @ Rs 17 per 40 kgs of seed cotton for each 1/32" of staple length as per formula of KCA, the revised grade and staple margins are given below in Table-17.

Table-17: Revised Grade and Staple Margins for Seed Cotton

Grade	Staple length				
	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
	---------- Rupees per 40 kgs ----------				
Super	12	29	46	63	80
One	2	19	36	53	70
Two	-6	11	28	45	62
Three	-17	Base	17	34	51
Four	-29	-12	5	22	39
Five	-42	-25	-8	9	26

Note: The above margins are applicable to the seed cotton of micronaire ranging between 3.8 and 4.9 NCL.

149. Since seed cotton is not directly purchased by the implementing agency i.e. Trading Corporation of Pakistan, the above premia/discounts serve only as indicative ones. TCP buys lint and to ensure that the above premia/discounts are applied in the open market, the TCP should offer equivalent premia/discounts on lint which calculate as under in Table-18.

Table-18: Premia/Discounts for Various Grades/Staple Lengths for Lint to be Offered to the Procurement Agency

(Rs per 40 kgs)

Grade	Staple length				
	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
Super	113	172	231	288	347
One	61	118	175	231	288
Two	4	60	116	170	226
Three	-54	Base	54	107	161
Four	-116	-64	-12	40	92
Five	-178	-128	-77	-28	23

150. The discounts for various grades of seed cotton having micronaire values outside the acceptable range are given in Table-19.

Table-19: Discounts for the Micronaire Beyond Specified Limits

Micronaire below 3.8 in Grades Super, 1,2 and 3 and below 3.5 in Grades 4 and 5 or micronaire in excess of 4.9 for all grades	Per cent discount
0.1	0.5
0.2	1.0
0.3	2.0
0.4	3.0
0.5	4.0

Note: The varieties grown in Pakistan generally do not have problems of micronaire as it falls within the acceptable limits during most of the picking season except for very early or late pickings.

151. Thus, it is believed that if the TCP offers premia/discounts as provided in Tables-18 and 19, the growers would be encouraged to produce quality seed cotton. The market would also encourage the production and sale and purchase of quality lint.

11. IMPLEMENTATION OF SUPPORT PRICE FOR SEED COTTON, 2002-03 CROP

152. For the crop of 2002-03, the Federal Government fixed the support/intervention price of seed cotton at Rs 800 per 40 kgs and directed that TCP should implement the same. During the course of APCom's field survey in December 2002 and the meeting of its Standing Committee on Cotton held on 17-2-2003 at Faisalabad, inter alia, the issues of prices received by the growers and other aspects of cotton marketing were discussed at length.

11.1 Prices Received by Farmers

153. The prices of seed cotton in the main producing area markets of Sindh during September 2002 to January 2003 averaged at Rs 847 per 40 kgs. In Punjab, the market prices in September and October 2002 ranged from Rs 846 to 876 per 40 kgs. In November price jumped to Rs 909 and stabilized around Rs 914 - 915 during December and January. Thus, market prices both in Sindh and Punjab ruled much above the support price of Rs 800 per 40 kgs. In Punjab the lowest average price was reported at Rs 835 per 40 kgs in Okara market during the month of September, whereas highest average price was Rs 959 in Multan market during the month of January 2003. It was only the Mirpurkhas market in Sindh where the average wholesale prices of seed cotton fell below the support price during December and January and perhaps this was due to quality of cotton which, towards the end of season (Dec-Jan) is generally inferior. In other markets of Sindh, the prices during the whole season remained above the support price and the highest price was noticed at Rs 884 per 40 kgs in Nawabshah market during the month of October 2002. The overall average price ranged between Rs 807 and Rs 876 per 40 kgs.

11.2 Procurement Arrangements

154. As discussed above during the harvest season of 2002-03, price of seed cotton remained higher than the support price of Rs 800 per 40 kgs, therefore, TCP did not enter the market for procurement of cotton. No procurement target was fixed for TCP for support price implementation. However, TCP was reportedly prepared for procurement operations if the situation so warranted and made necessary arrangements for cotton purchases. It opened 12 cotton procurement centers: 8 in Punjab, 3 in Sindh and 1 in Balochistan.

11.3 Problems in Implementation

155. In view of the firmness in market prices of cotton, TCP did not make any procurements during 2002-03 season. However, the organization is confronted with a number of problems in cotton marketing which need to be addressed so that in times of need it can perform its assigned task efficiently.

i) Sometimes due to high procurement price and low international cotton prices, the TCP incurs huge losses which should be absorbed by government. In the absence of picking up of the losses of TCP, the organization is handicapped to make procurement operations.

ii) It does not have adequate cotton testing equipments for testing micronaire, staple length, trash and colour of cotton. Similarly, its available capacity for haulage of procured cotton is inadequate.

iii) TCP does not have adequately trained and technical expertise to undertake large scale cotton procurement operations. It has to depend on the services of ex-CEC employees on contract basis and also the cotton classers of PCSI.

156. For effective implementation of support price policy for seed cotton, the problems of TCP (the implementing agency) as summarized above need to be addressed.

12. IMPROVING PRODUCTIVITY, QUALITY AND MARKETING

157. For the purpose of enhancing profitability of cotton for the growers it is imperative to improve yield per acre and the market price received by the growers. In this connection a number of non-price measures are given in this section for enhancing productivity and improving marketing and quality of cotton.

12.1 Improving Productivity

158. Enhancing cotton production in general and through improving per hectare yield in particular has been perceived a leading objective of any national agricultural policy. The achievement of this objective requires an integrated campaign entailing: (i) adoption of high yielding disease resistant varieties; (ii) provision of improved certified seed in sufficient

quantity; (iii) balanced and judicious use of fertilizers; (iv) protecting the crop against insect pest attack through Integrated Pest Management (IPM) approach. These measures of improving productivity were discussed in the Support Price Policy for Seed Cotton 2002-03 crop but did not get space in the summary presented by MINFAL to the ECC.

159. The APCom has reviewed its earlier recommendations on productivity issue in the light of the discussions with the coordinator IPM and in the meeting of the Standing Committee on Seed Cotton on 17-02-2003. These discussions have reinforced our view that measures relating to productivity enhancement as highlighted by APCom in its previous support price policy reports should become the components of an integrated approach on the subject. No doubt the breeders have evolved high yielding cotton varieties but their premature propagation at commercial scale has caused a lot of problems. Similarly, public and private sectors are actively involved in seed business but desired seed is not reaching to the growers. Seed of unapproved varieties is being distributed by local seed agencies/traders. The growers are not aware of new varieties and sources of pure seed of these varieties and associated cultural and agronomic practices. The researchers and growers have also expressed a serious concern about the menace of CLCV, which keeps on raising its ugly head in cotton areas. The problem of soil degradation has also been identified as a major reason of declining productivity. The following paragraphs highlight the issues relating to the availability improved seed of CLCV resistant varieties, balanced use of plant nutrients/soil management and Integrated Pest Management (IPM).

12.1.1 Improved seed

160. Improved seed holds the key to enhance crop productivity. However, its availability in sufficient quantity is one of the major constraints. As cotton is an open pollinated crop, the experts recommend to cover the entire area with the certified seed every year. The requirement of improved seed of cotton estimated for the Punjab and Sindh alongwith the supply of certified seed both in public and private sectors in these provinces have been reviewed for the period 1992-93 to 2002-03.

- **Punjab**

161. The data presented in Annex-~~XIX~~ reveal that during the decade ending 2002-03, total annual requirement of certified seed of cotton, has ranged between 43 and 51 thousand tonnes.

Both public and private sectors are marketing the seed of cotton. The public sector mainly comprises the Punjab Seed Corporation. No doubt seed produced, multiplied and distributed by the Punjab Seed Corporation (PSC) has enjoyed an edge in quality over that supplied by the private sector but overtime supplies by PSC have declined from about 13 thousand tonnes in 1992-93 to 3.30 thousand tonnes in 2001-02 and 5.74 thousands tones in 2002-03 mainly due to lack of resources. The private sector, however, has increased its cotton seed supplies from 3 thousand tones in 1992-93 to 28 thousand tones in 2002-03 which has compensated the short supplies from public sector. Thus, total supplies from both the sectors covered about 78 per cent of the total area under cotton.

162. Variety wise seed supplies for sowing 2002-03 crop as given in Annex-XXI has revealed that Niab-78 still occupies the largest area under cotton in the Punjab (35.48 %) followed by some high yielding varieties of CIM-446, CIM-109, Karishma, FH-90, FH-900, CIM-482, BH-36 and BH-118 which together cover 40 per cent of the area under cotton. The other high yielding varieties include CIM-448, CIM-240, SLS-1, CIM-443 and CIM-473 but due to non availability of their seed they could not expand much. All the above varieties meet about 78 per cent of the total seed requirement for 2002-03 cotton crop in the province. Thus, encouraging the production of certified seed in public and in private sector and making it available to the growers may enhance the cotton productivity to a considerable extent.

- **Sindh**

163. The data regarding requirement and supply of certified seed of cotton in Sindh (Annex-XX) indicate that during the decade ending 2002-03, supply of certified seed has been very much disappointing. During 1997-98 and 1998-99 private sector did increase the supply of cotton seed of relaxed standard to 8.37 and 23.17 thousand tonnes respectively but the position remained deteriorated regarding certified seed. During 2002-03, private sector, however, managed to supply 2080 tones of certified seed, which covered about 13 per cent of the total cotton area of the province. Thus, there exists a substantial scope of enhancing productivity of cotton crop through increasing supply of certified seed.

164. Variety-wise information in Sindh during 2002-03, presented in Annex-XXI indicates that major variety adopted in this province is still NIAB-78 occupying more than 99 per cent of

the cotton area sown with certified seed (12.73). The other variety grown is CRIS-9 but it has hardly covered 0.02 per cent of the cotton acreage.

165. The situation explained above needs that the only seed supply sector in the province i.e. private sector should be encouraged to multiply and distribute the seed of all important varieties recommended for cultivation in the province so that farmers could benefit from the fruits of cotton research.

12.1.2 Soil management/balanced use of nutrients

166. Intensive cropping, imbalanced use of chemical fertilizers, inadequate use of organic manure have caused continuous drain on soil nutrients resulting in soil depletion both in major and minor nutrients. Moreover, increasing salinity, sodicity, agro-chemical pollution and soil erosion have also posed a serious threat of soil de-gradation causing a decline in productive capacity of the land, and reducing potential yields. Cotton, being a deep rooted crop, extracts nutrients from different layers but hard pans developed in the soil are hindering the proper development of its roots resulting in retarded growth and lower yields. The productivity of cotton has also declined due to degradation of soil mentioned above. The empirical results on nutrient uptake by cotton have shown that one hectare of this crop annually removes about 73 kgs of N, 28 kgs of $P_2 O_5$, 56 kgs of K and several other micro nutrients. Assuming 50 per cent efficiency for applied fertilizers the doses of applied fertilizers are not only sub optimal but also imbalanced. This in turn is affecting the productivity and production of crop.

167. To arrest further degradation/deterioration of soil and soil fertility and in turn crop productivity there is an urgent need of launching a comprehensive and well coordinated campaign for adding organic as well as inorganic nutrients to the soil, making it free from agro-chemical pollution by adopting non toxic method of Integrated Pest Management (IPM), re-building top soil by soil amendments entailing periodic use of farm yard manure, adoption of green manuring practices and incorporation of crop residues, use of bio fertilizers, composts, balanced doses of chemical fertilizers based on soil analysis etc. For better achievement on the subject provincial agricultural research institutes are required to develop various bio fertilizers

and area/crop rotation specific fertilizer recommendation and their wide publicity through extension department.

12.1.3 Integrated pest management (IPM)

168. Before 1980 Jassid was the only key pest in cotton farming. But the extensive use of pesticides overtime has changed the pest complex. Beside jassid, bollworms and whitefly have become major pests in cotton production. American bollworm, aphid and tea mites were originally not the pests of cotton in Pakistan. However, as a result of indiscriminate use of pesticides they have become key pests in cotton causing in huge production losses. The losses due to insect pests increased from 250 thousand bales in 1992-93 to 3050 thousand bales in 1998-99 (FAO-2001). Besides direct yield losses, the insects also cause indirect loss by transmitting diseases to crops and impacting on the quality of produce. For example whitefly has been a major source of transmitting cotton leaf curl virus in Pakistan since 1993-94.

169. Aggressive marketing of pesticides by private companies through electronic and other mass media and fear of pest outbreak have trapped the farmers in a pesticide treadmill of more frequent applications, which is the main reason of current crisis. The indiscriminate use of pesticides poses a heavy threat to the life and environment. The situation inter alia, demands the adoption of an integrated approach involving certain cultural, biological and chemical measures as no single method by itself may be able to achieve the desired objective. These include: (i) use of varieties resistant to insects and diseases; (ii) adoption of cultural practices (crop rotation, inter-cropping, timing of planting) that prevent build up of pests; (iii) trapping of pests with trap crop; (iv) selective and judicious use of pesticides including bio-pesticides; (v) biological control by predators parasitoids or insect pathogens; (vi) microbial control; (vii) insect growth regulators; (viii) sex-pheromones (ix) physical control (mechanical removal of pests). These measure are briefly discussed below:

12.1.3.1 Resistant varieties

170. The hairy varieties of cotton are resistant to jassid attack. Moreover, Nectariles cotton provides resistance to bollworms and leaf hoppers. In Pakistan most of the cotton varieties

evolved by our breeders possess these characters. The breeding of cotton varieties resistant to bacterial blight and root rot of cotton has also been advanced.

12.1.3.2 Cultural practices

171. These include hoeing and destruction of weeds, inter-cropping, changing planting times, crop rotation etc. The typical role of different practices in the control of pest attacks is given below:

a) Hoeing and destruction of weeds and alternate host plants in cotton area before and after the sowing of cotton help in minimizing the population of whitefly, American bollworm, spotted bollworm, army worm, mites and sucking pests.

b) Early planting of cotton encourages attack of thrips and spotted bollworms, while its late planting results in late maturity and heavy infestation of pink bollworm.

c) In cotton-wheat and cotton-fallow rotation a pest free period of almost six months helps to eliminate hibernating and diapausing larvae of bollworms.

d) Maize helps in buildup of H.armigera. The planting of maize and sorghum around cotton fields also helps in multiplication of parasitoids and predators.

e) Infestation of jassid in cotton is reduced during hot and dry seasons. High temperatures induce sterility in pink bollworm.

f) Lucern helps in conservation of predators to control sucking pests. The most important predators are the green lace wing (Chrysoperla carnea), flower bug (Orius Sp) and syrphid fly. Other predators include Geocorus Sp., Corams Sp., beetles, spiders and birds.

g) Animal grazing after last picking i.e recommended to avoid carry over, and control pink bollworm. Removal of cotton sticks and shedding of left over bolls and then their destruction alongwith burning of waste of ginning factories also minimize the pink bollworm infestation to coming crop.

h) Post-harvest ploughing with furrow turning plough and early irrigation help in reducing the diapausing pink bollworm population in cotton fields.

172. The National IPM programme should be provided sufficient funds to ensure these practices at farmer's fields.

12.1.3.3 Biological control

173. This method includes conservation, redistribution, augmentation and introduction of natural enemies i.e. parasites and predators. The predators are more important in Pakistan than parasites as they are more active in the early part of cotton season. The parasites multiply on bollowrm larvae quite late in the season when the crop has already matured.

174. The research has found that in Pakistan about one hundred natural enemies are associated with different cotton pests. The main predators are chrysopa species, onion species, Geocorus piders, corams species (already mentioned under cultural practices). These predators play an important role in regulating the sucking pests population and early bollowrm damages. Early use of chemicals results in the destruction of these predators and causing resurgence of pests. The government should strengthen the National IPM programme for accelerating research and encourage the private companies for commercial rearing and marketing of useful insects and other predators.

12.1.3.4 Microbial control

175. Micro-organisms, such as bacteria, viruses, fungi etc. cause diseases in pests and help in keeping their population at low levels. Environmental factors such as temperature, relative humidity, rainfall, by affecting the behaviour of pests also play an important role in the development and dissemination of these organisms. IPM institute at Multan should undertake research on microbial control of pests and introduce its findings among the growers for their adoption.

12.1.3.5 Insect growth regulators

176. These are special groups of chemicals that alter growth and development of insects. These are commonly known as third generation insecticides and are selective, specific and nontoxic to human, wild life and environment. Consequently, they are compatible with IPM programmes. These pesticides/chemicals include acdysone, juvenile hormone, juvenile hormone mimic and juvenile hormone analogue. Some research work to determine the effectiveness of growth regulators viz. Atabron and Cascade against bollworms of cotton is reportedly in

progress. This task should be completed expeditiously and results disseminated for practical utility.

12.1.3.6 Sex-pheromones

177. Insect pheromones are extremely powerful species specific attractants, which are emitted by female insects to attract males for mating. The multi directional research has resulted in the development of behavioural control through sex-pheromones which are used in three ways; (a) monitoring of insect population; (b) mass trapping by using large numbers of traps to kill the male population; (c) direct control through disruption of mating by saturating the atmosphere with pheromones so that insects become unable to find a mate.

178. The pheromones have several advantages over conventional insecticides used for insect control. They are specific for the target species, non-toxic to plants and animals and do not contaminate the environment with poisonous residues. The species specific nature of pheromones preserves beneficial insects and thus prevents the outbreaks of other minor pests. The research has identified and synthesized such attractants for use as potential pest control agent. Extension staff in collaboration should promote their use with private pesticide companies.

12.1.4 Farmer-led cotton IPM programme in Pakistan

179. IPM is the best alternative to indiscriminate use of costly pesticides leading to many attached problems of health hazards and residues in food chain. There has been a lot of research in this area elsewhere as well as in Pakistan but the transfer of this approach remains a bottleneck. A number of different methods were tried but the training of facilitators (TOF) and farmer field school (FFS) approach developed by FAO is found to be successful. Under this approach, the Government of Pakistan has launched the cotton IPM programme in collaboration with provincial governments. The objectives of programme are :-

- To develop a cadre of cotton IPM trainers from existing extension or field plant protection staff to train farmers in Farmer Field Schools.
- To promote co-operation for cotton IPM among research institutions, develop agencies, extension services, farmers and NGOs and to improve access for all interested parties to information from within and outside of the programme area.

Sustainable, profitable and environmentally sound production of cotton through the development, promotion, and practice of IPM by framers and extension staff is the ultimate objectives.

180. In 2002, two TOFs were conducted one at Mirpur Khas and one at Bahawalpur in which 60 facilitators were trained along with 325 farmers. So far 107 facilitators form Agricultural Extension Sindh, Punjab and Balochistan and 2487 farmers from Sindh and Punjab have been trained.

181. The APCom recommends that this Farmer-led Cotton IPM Programme should be strengthened and extended to other areas/crops.

12.1.5 Quality control of pesticides

182. As mentioned earlier, aggressive marketing of pesticides by private companies through electronic and other mass media has resulted in rapid increase in the sale of pesticides and their indiscriminate use. In the APCom's Standing Committee meeting held on 17-02-2002 and filed survey of 2002-03 crop, the growers have complained about the adulteration and inturn ineffectiveness of the pesticides being marketed. As a result, the economy of both the farmers and country has suffered. To arrest the sale of adulterated pesticides and their indiscriminate use, strict quality control is needed. For this purpose, following suggestions are made:

- Each pesticide company be asked to appoint its own dealers for sale of a product imported and marketed by that company. Each branded product of a particular firm should only be available from the authorized dealer of that firm.
- Magistrates be appointed/posted/transferred with Agricultural Department for speedy disposal of pesticide cases.
- To avoid under dosing of pesticides, each importer and or distributor should indicate the nature of active ingredient and its concentration in a branded product to Provincial Directorate of Plant Protection who should fix/recommend the dose of each product for a particular pest or disease.

183. The government may consider the above proposal for improving the quality and effectiveness of pesticides marketed in the country.

12.2. Improving Quality of Cotton

12.2.1 Picking

184. For improving cotton quality, proper picking plays an important role. In order to get best results, cotton picking should start when 60 per cent of the bolls have opened. Further, picking should start when dew has dried. The picked seed cotton (phutti) should be kept separately for each variety and be placed/stored in dry conditions. Moreover, the produce of first/earlier pickings may not be mixed with the last one. In order to get good results, the produce from dirty, pre-matured, un-opened and infected bolls should not be mixed with the produce of healthy bolls.

12.2.2 Ginning

185. Improved ginning can help in improving the cotton quality. The defective machinery used in ginning adversely affects the staple length and its strength. The saws used by the domestic ginning industry are often of poor quality. In order to obtain best quality lint the saws need to be replaced after producing two to three thousand bales. But most of the ginners instead of replacing the saws, get their teeth sharpened. The teeth however, get deformed in that process. Resultantly, the quality of lint is adversely affected which in turn impacts the quality of the products down the line. As ginning remains one of the weakest links in the chain to improve the quality of cotton lint, it needs the attention of policy planners. There is a need to up grade and modernize this sector by providing incentives for installing modern ginning machinery, pre-ginning cleaners and lint cleaning apparatus. Moreover, in order to get lint of higher grades, research should also be undertaken on different types of ginning and cleaning machines and ginning techniques.

186. Keeping in view the above problems, APCom had recommended in the previous years that "A Ginning Research Institute should be established at Multan to deal with the issues of cotton grades and other problems relating to the quality of lint". This recommendation is reiterated to be implemented during 2003-04.

187. The TCP has reported that government has approved the standard net weight of a cotton bale as 170 kgs but the ginners are still producing short weight cotton bales which create

problems in crop estimation and export. The ginning factories should be directed to desist from this practice and produce standard bales of 170 kgs.

12.2.3 Contamination free cotton

188. The contamination in raw cotton continues to be quite serious affecting adversely the industry and exports. In order to restore the credibility of Pakistani cotton in the international market and fetch its intrinsic value, the government of Pakistan launched the programme for the production of contamination free cotton in 2001-02 season. The programme was launched in Rahim Yar Khan district of Punjab, Ghotki in Sindh and Nasirabad in Balochistan. As reported by APTMA, the contamination level due to the implementation of cotton standardization system for the production of high quality contamination free cotton in the district of Rahim Yar Khan was reduced from 19 grams to 5 grams per bale. In ginning factories of Rahim Yar Khan, where PCSI prescribed procedures for the production of high quality contamination free cotton had been fully adopted, the contamination level ranged between 0.74 to 1.97 grams per bale. The project was successfully implemented in the districts of Rahim Yar Khan and Nasirabad by producing 1.2 million bales, but due to one or the other reason, it could not be carried out in Ghotki district.

189. The Work on checking the contamination in Pak cottons has been recognised internationally. The PCSI has reported that ITMF had ranked Pakistan as Number 2 among the contaminated cotton producing countries in 1999, while in its 2-years report of 2001, Pakistan has been placed at Number 25 which is a remarkable achievement.

190. Keeping in view the success of the implementation in 2001-02, it was decided to extend the same model in 2002-03 to more districts i.e Sanghar in Sindh, Bahawalpur in Punjab and rest of cotton areas in Balochistan. In this regard, the PCSI devised a comprehensive work plan to implement the cotton standardization system for the production of high quality contamination free cotton. The arrangements included the classification of lint cotton and issue of lint cotton quality certificate. The survey of the entire ginning factories of the selected districts was made and 130 more selectors and classers in cotton classing and grading were trained to add to 1,070 persons who had been trained previously. The PCSI prepared and provided seed cotton grade

boxes and lint cotton standards boxes to concerned ginneries. The buyer was required to pay premium according to the contamination level over and above the prevailing market price of cotton of the area in which factory was located. The level of contamination and their premia on cotton lint for 2002-03 crop, as reported by TCP, were decided as under:

Level of Contamination (in grams per bale)	Premium	
	Rs per 40 kgs	Rs per maund
(a) Upto 1.5	160.00	150.00
(b) Upto 2.5	80.00	75.00
(c) Upto 3.0	53.00	50.00

191. In Rahim Yar Khan, the use of jute and polypropylene bags for the transportation of seed cotton as amended under the Cotton Control Act, 1966 has been banned. The arrivals of seed cotton into the ginning factories are in open trollies or in cotton cloth bags, while in district Bahawalpur, the administrative arrangements have been partially implemented due to non-observance of ban on the use of jute and polypropylene bags. Similarly, in Ghotki and Sanghar districts these arrangements have been taken very recently and are being implemented partially. In Balochistan, these arrangements have also not been implemented properly.

192. The TCP has registered 10 cotton ginning factories (one in Sindh, seven in Punjab and two in Balochistan) for the production of high quality contamination free cotton. The PCSI classers have classified about 253,500 cotton bales in Sanghar, Ghotki, Rahim Yar Khan, Bahawalpur and Dera Allah Yar areas. The Ministry of Commerce has directed the TCP to procure 20,000 bales of clean cotton at prevailing market price but till the third week of February 2003, only 400 bales had been contracted by TCP. This is a negligible number of bales which cannot be helpful in making the programme of contamination free cotton a success.

193. Like wise, most of the textile mills are also reported to be reluctant to purchase contamination free cotton at premium price, consequently, defeating a very useful programme. The programme/campaign of production of contamination free cotton by the Government was launched on the demand of APTMA/textile mills as supply of such cotton to local textile industry improves the quality of textile products, helps industry in competing in the global market, enhances the value of textile products, thereby increasing the foreign exchange earnings

of the country. Textile industry should, therefore, come forward for success of this scheme and purchase all the bales of clean cotton, otherwise a highly desired and valuable programme of contamination free cotton will end with a failure and the country will suffer in its quest of increasing export earnings.

12.3 Improving Marketing

12.3.1 Under-weighment and undue deductions

194. The underweighment and undue deductions in cotton marketing on the part of 'beoparies', ginners and commission agents is not of recent origin. It is very common and wide spread practice. During the APCom field survey in the main cotton growing areas and also in the meeting of Standing Committee on Cotton, held at Faisalabad on 17-2-2003, the farmers complained about underweighment and undue deductions by the market intermediaries. In order to check these malpractices in cotton marketing, supervisory committees consisting of the representatives of Provincial Agriculture Departments, local market committees, growers and cotton dealers may be constituted.

12.3.2 Proper packing and labeling

195. Proper packing and labeling helps in improving the marketing of a commodity through good presentation and economizing the transaction time by attracting the buyers' demand. False labeling in the past had brought bad name for the country. It is, therefore, of utmost importance that the truthful labeling and proper packing should be ensured. The MINFAL should ensure proper labeling of cotton lint in accordance with the grade, staple length and micronaire actually contained in the pack.

12.3.3 Study on marketing system

196. Besides the above mentioned problems in marketing of cotton, there are a number of other issues which need to be studied and solved for smooth functioning of the marketing system. Delayed payments of cotton proceeds to growers by dealers and ginning factories, non-payment of price according to quality of produce and high marketing charges may be mentioned

for instance. In this respect APCom's last year's suggestion is reiterated below for implementing during 2003-04 season.

> "The marketing system may be studied with reference to marketing costs, delayed payments, payments according to quality, underweighment and undue deductions from the growers".

13. COTTON PROUCTION PROSPECTS AND MARKETING ISSUES IN BALOCHISTAN

197. Cotton farming having good prospects in Balochistan is being promoted in Lasbella, Dera Murad Jamali, Khuzdar and Jafarabad districts. A team of APCom's officers visited some of the important cotton growing areas in December 2002 and held extensive discussions with the growers. Based on these discussions some of the major problems faced by the growers in cotton production in the province are briefly discussed below. In spite of the concerted efforts at promotion of cotton cultivation, farmers by and large lack technical know-how of the important aspects of its production technology. Farmers have also faced problems on account of non-availability of quality seed in sufficient quantity. Farm machinery needed for modern cotton farming is also not available. There is also shortage of cotton pickers which have to be brought/ transported from other areas. These are teething problems which any new enterprise is likely to face. However, what is important is that they are addressed on priority so as to encourage cotton production in the province.

198. In the irrigated areas where cotton is being promoted, cultivation of rice is well entrenched. Cotton produced in the province is reported to be of high quality, does not involve much use of chemical pesticides and is free from contamination. According to PCSI/PCCC lint prepared in the province is of + 1 Grade with the following characteristics:

Micronaire	4.5
Inlongition	6.5
Moisture	8.5 %
Maturity	7.5 %
Strength	90,000 lb per square feet.

199. However, in view of the lack of institutional support for marketing and ginning facilities marketing remains problematic. Farmers are required to transport produce to far-flung ginneries 'mandis' at exorbitant cost which reduces their net prices.

200. Marketing and ginning of seed cotton are the important problems of the growers in Balochistan. Two ginning factories in Jhat Pat area have been installed in previous year. Marketing channels are not so developed. Thus, therefore, many growers have to transport their produce to Rahim Yar Khan for selling, costing Rs 60 – 90 per 40 kgs. Time spent in transporting is 24 hours or even more. Ginning factories are making efforts to provide quality seed prepared by themselves to meet the requirement of cotton growers to some extent.

201. It is imperative to support the farmers with technical know-how and technology package as well as arrange for efficient marketing of the produce. Cultivation of coarse rice although important for meeting the food requirements of the local population, however, is highly demanding in terms of water which is a precious commodity. It would be in the fitness of things to analyze the comparative economics of cotton, rice and other competing crops and disseminate the results among the farmers so as to promote those commodities which enjoy comparative advantage from the national perspective.

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ANNEX-I

RECOMMENDED SOWING TIMES OF AMERICAN COTTON

Province/District	Time of Sowing
PUNJAB	
Faisalabad, Sargodha	1st May to 15th June
Jhang, Toba Tek Singh,	1st May to 15th June
Mianwali	10th May to 15th June
Sahiwal, Pak Pattan, Okara,	1st May to 15th June
Multan, Lodhran, Vehari	1st May to end of June
Khanewal,	15th May to 15th June
Bahawalpur, R.Y. Khan,	1st May to 15th June
Bahawalnagar	1st May to 20th June
Muzaffargarh, Layyah, D.G. Khan, Rajanpur	1st May to end of June
SINDH	
Mirpur Khas, Tharparkar	Ist March to 15th April
Hyderabad, Badin	10th April to 10th May
Sanghar	Mid April to mid May
Dadu, Khairpur Sukkur, Ghotki	Mid May to 10th June
Nawabshah	1st May to 31st May
NWFP	
D.I. Khan	1st May to 31st May
BALOCHISTAN	
Lasbela, Dera Murad Jamali, Nasirabad	1st May to 31st May

Sources:
1. Cotton Research Station, Multan
2. PCCC, Karachi
3. Cotton Research Institute, Sakrand

ANNEX-II

PROVINCE-WISE AREA(HECTARES), PRODUCTION AND YIELD OF COTTON IN PAKISTAN:1992-93 TO 2002-03

YEAR	PUNJAB	SINDH	NWFP	BALOCH	PAKISTAN
AREA		---------000 hectares---------			
1992-93	2437.8	397.4	0.5	0.2	2835.9
1993-94	2249.2	554.9	0.2	0.3	2804.6
1994-95	2244.4	405.6	0.3	2.5	2652.8
1995-96	2463.3	529.3	0.2	4.5	2997.3
1996-97	2540.2	601.2	0.3	6.9	3148.6
1997-98	2348.4	600.3	0.5	10.5	2959.7
1998-99	2282.8	630.2	0.4	9.4	2922.8
1999-00	2329.3	633.5	0.3	20.0	2983.1
2000-01	2386.4	523.6	0.2	17.3	2927.5
2001-02	2526.4	547.4	1.6	40.4	3115.8
2002-03	2155.7	542.6	4.0	40.6	2742.9
YIELD		---------kgs per hectare-------			
1992-93	575	349	238	425	543
1993-94	493	465	340	397	488
1994-95	562	538	227	313	558
1995-96	602	598	255	495	601
1996-97	476	637	340	493	506
1997-98	494	662	272	494	528
1998-99	494	576	298	496	512
1999-00	643	638	340	493	641
2000-01	609	696	340	496	624
2001-02	542	759	436	502	579
2002-03	587	756	383	543	620
PRODUCTION		---------000 bales----------			
1992-93	8237.1	815.5	0.7	0.5	9053.8
1993-94	6523.0	1517.9	0.4	0.7	8042.0
1994-95	7410.0	1282.1	0.4	4.6	8697.1
1995-96	8720.0	1861.5	0.3	13.1	10594.9
1996-97	7103.4	2250.2	0.6	20.0	9374.2
1997-98	6817.0	2335.5	0.8	30.5	9183.8
1998-99	6628.0	2134.1	0.7	27.4	8790.2
1999-00	8804.0	2377.4	0.6	58.0	11240.0
2000-01	8540.0	2141.1	0.4	50.4	10731.9
2001-02	8046.0	2443.2	4.1	119.3	10612.6
2002-03	7445.0	2411.8	9.0	129.7	9995.5

Note: One bale =170.09 kgs = 375 lbs

Sources:
1. For 1992-93 to 2000-01: Agricultural Statistics of Pakistan 2000-01, MINFAL, Islamabad.
2. For 2001-02: Final estimates supplied by MINFAL, Islamabad
3. For 2002-03: Second estimates Provided by Provincial Agriculture Departments.

ANNEX-III

PROVINCE-WISE AREA (IN ACRES), PRODUCTION AND YIELD OF COTTON IN PAKISTAN :1992-93 TO 2002-03

YEAR	PUNJAB	SINDH	NWFP	BALOCHISTAN	PAKISTAN
AREA		---------000 acres---------			
1992-93	6024.0	982.0	1.2	0.5	7007.8
1993-94	5558.0	1371.2	0.5	0.7	6930.4
1994-95	5546.1	1002.3	0.7	6.2	6555.3
1995-96	6087.1	1308.0	0.5	11.1	7406.6
1996-97	6277.1	1485.6	0.7	17.1	7780.5
1997-98	5803.1	1483.4	1.2	25.9	7313.7
1998-99	5641.0	1557.3	1.0	23.2	7222.5
1999-00	5755.9	1565.4	0.7	49.4	7371.5
2000-01	5897.0	1293.9	0.5	42.8	7234.1
2001-02	6243.0	1352.7	4.0	99.8	7699.5
2002-03	5327.0	1340.8	9.9	100.3	6778.0
YIELD		---------kgs per acre-------			
1992-93	233	141	96	172	220
1993-94	200	188	138	161	197
1994-95	227	218	92	127	226
1995-96	244	242	103	200	243
1996-97	192	258	138	200	205
1997-98	200	268	110	200	214
1998-99	200	233	120	201	207
1999-00	260	258	138	200	259
2000-01	246	281	138	201	252
2001-02	219	307	176	203	234
2002-03	238	306	155	220	251
PRODUCTION		---------000 bales----------			
1992-93	8237.1	815.5	0.7	0.5	9053.8
1993-94	6523.0	1517.9	0.4	0.7	8042.0
1994-95	7410.0	1282.1	0.4	4.6	8697.1
1995-96	8720.0	1861.5	0.3	13.1	10594.9
1996-97	7103.4	2250.2	0.6	20.0	9374.2
1997-98	6817.0	2335.5	0.8	30.5	9183.8
1998-99	6628.0	2134.1	0.7	27.4	8790.2
1999-00	8804.0	2377.4	0.6	58.0	11240.0
2000-01	8540.0	2141.1	0.4	50.4	10731.9
2001-02	8046.0	2443.2	4.1	119.3	10612.6
2002-03	7445.0	2411.8	9.0	129.7	9995.5

Note: One bale =170.09 kgs = 375 lbs

Sources:
1. For 1992-93 to 2000-01: Agricultural Statistics of Pakistan 2000-01, MINFAL, Islamabad.
2. For 2001-02: Final estimates supplied by MINFAL, Islamabad
3. For 2002-03: Second estimates Provided by Provincial Agriculture Departments.

ANNEX-IV

DISTRICT-WISE AREA AND PRODUCTION OF SEED COTTON: AVERAGE OF 2000-01 TO 2002-03

		Area	Production	Yield
		000 hectares	000 bales	Kgs/ha
S.No.	Province/District	Area	Percentage	Production	Percentage	Yield
	PUNJAB					
1	R.Y.Khan	314.97	10.79	1103.92	10.64	596.13
2	Bahawalpur	268.16	9.19	1037.54	10.00	658.09
3	Vehari	228.91	7.84	877.27	8.46	651.85
4	Lodhran	197.48	6.76	750.17	7.23	646.12
5	Rajanpur	152.03	5.21	702.00	6.77	785.41
6	Khanewal	188.31	6.45	660.57	6.37	596.65
7	Multan	174.01	5.96	600.93	5.79	587.41
8	M.Garh	190.20	6.51	590.33	5.69	527.91
9	Bahawalnagar	195.73	6.70	563.75	5.44	489.90
10	D.G.Khan	96.85	3.32	418.19	4.03	734.43
11	Sahiwal	76.08	2.61	171.38	1.65	383.14
12	Jhang	54.63	1.87	110.12	1.06	342.84
13	Pakpatan	54.77	1.88	106.87	1.03	331.92
14	T.T.Singh	41.01	1.40	92.81	0.89	384.98
15	Layyah	38.31	1.31	75.57	0.73	335.50
16	Faisalabad	37.50	1.28	72.39	0.70	328.36
17	Okara	18.21	0.62	33.31	0.32	311.13
18	Bhakkar	4.18	0.14	10.92	0.11	443.86
19	Kasur	8.36	0.29	10.38	0.10	211.10
20	Sargodha	8.49	0.29	9.73	0.09	194.79
21	Mianwali	3.78	0.13	8.29	0.08	373.21
22	M.B.Din	2.29	0.08	2.15	0.02	159.71
23	Sheikhupura	0.80	0.03	0.84	0.01	177.15
24	Jhelum	0.41	0.01	0.34	0.00	142.43
25	Khushab	0.41	0.01	0.29	0.00	121.29
26	Chakwal	0.27	0.01	0.26	0.00	161.79
	PUNJAB Sub-total	**2356.16**	**80.70**	**8010.32**	**77.23**	**578.26**
	SINDH					
1	Ghotki	103.96	3.56	482.94	4.66	790.13
2	Sanghar	104.75	3.59	457.32	4.41	742.61
3	Khairpur	71.76	2.46	315.04	3.04	746.68
4	Nawab shah	61.12	2.09	273.05	2.63	759.85
5	Hyderabad	47.52	1.63	181.80	1.75	650.80
6	Mirpurkhas	47.13	1.61	162.79	1.57	587.56
7	N.Feroze	35.42	1.21	153.44	1.48	736.88
8	Sukkur	28.46	0.97	128.85	1.24	770.07
9	Tharparkar	10.11	0.35	33.29	0.32	560.15
10	Dadu	6.12	0.21	26.43	0.25	734.53
11	Jacobabad	3.90	0.13	15.19	0.15	663.16
12	Badin	3.75	0.13	10.09	0.10	458.07
13	Larkana	2.17	0.07	8.24	0.08	646.47
14	Shikarpur	2.02	0.07	7.38	0.07	621.93
15	Thatta	0.48	0.02	1.55	0.01	550.55
	SINDH Sub-total	**528.64**	**18.11**	**2257.39**	**21.76**	**726.31**
	NWFP Sub-total	**1.96**	**0.07**	**4.50**	**0.04**	**391.05**
	BALOCH. Sub-total	**32.76**	**1.12**	**99.79**	**0.96**	**518.07**
	PAKISTAN Total	**2919.53**	**100.00**	**10372.01**	**100.00**	**604.27**

Note:

1. Data have been arranged in descending order of production.
2. Percentage share calculated on the basis of country total.
3. Districts in which Seed Cotton is not grown or for which the data are not available, are excluded.

Source:

Ministry of Food, Agriculture and Livestock, Islamabad.

ANNEX-V

AVERAGE FARMERS' COST OF PRODUCTION ESTIMATES OF SEED COTTON IN THE PUNJAB: 2002-03 AND 2003-04 CROPS

Item	2002-03 crop	2003-04 crop	Change in 2003-04 over 2002-03
	------Rs/acre------		
- land preparation	976.87	1044.95	68.09
- Seed and sowing operations	617.72	627.87	10.15
- Irrigation including labour charges	1322.45	1786.07	463.62
- Interculture	672.88	704.63	31.75
- Plant protection inclusive of application charges	2323.16	2369.39	46.23
- Farm yard manure and Fertilizer including transportation and application	1467.90	1554.01	86.11
- Mark-up on investament @ 14 per cent per annum for 8 months	680.21	746.10	65.89
- Management charges for 8 months	290.00	290.00	0.00
- Land rent for 8 months	3166.67	3200.00	33.33
- land revenue including local rate chaukidara, etc.	5.00	5.00	0.00
- Payment to pickers	1173.90	1257.75	83.85
- Cutting of cotton sticks	185.00	185.00	0.00
- Land tax @ Rs 120/acre/annum	---	80.00	80.00
- Gross cost	12881.74	13850.76	969.02
- Value of cotton sticks	185.00	185.00	0.00
- Net cultivation cost	12696.74	13665.762	969.02
- Yeild per acre (kgs)	670.80	670.80	0.00
	-------Rs/40 kgs-----		
- Cost of production at farm level			
- including land rent	757.11	814.89	57.78
- excluding land rent	568.28	624.08	55.80
- Marketing expenses	14.00	15.00	1.00
- Cost of production at market/ginnery:			
- including land rent	771.11	829.89	58.78
- excluding land rent	582.28	639.08	56.80

ANNEX-VI

AVERAGE FARMERS' COST OF PRODUCTION ESTIMATES OF SEED COTTON IN SINDH: 2002-03 AND 2003-04 CROPS

Item	2002-03 crop	2003-04 crop	Change in 2003-04 over 2002-03
	------Rs/acre------		
- land preparation	998.32	1072.22	73.89
- Seed and sowing operations	777.78	792.78	15.00
- Irrigation including labour charges	504.35	545.55	41.20
- Interculture	904.76	922.25	17.49
- Plant protection inclusive of application charges	1748.83	1788.99	40.16
- Farm yard manure and Fertilizer including transportation and application	1527.73	1613.82	86.09
- Mark-up on investament @ 14 per cent per annum for 8 months	594.41	619.97	25.56
- Management charges for 8 months	290.00	290.00	0.00
- Land rent for 8 months	1766.67	1800.00	33.33
- land revenue including local rate chaukidara, etc.	5.00	10.00	5.00
- Drainage cess @ Rs 24/acre/annum for 8 month	-	16.00	16.00
- Payment to pickers	1204.80	1204.80	0.00
- Cutting of cotton sticks	285.00	285.00	0.00
- Land tax @ Rs 200/acre/annum	---	133.00	133.00
- Gross cost	10607.63	11094.36	486.73
- Value of cotton sticks	285.00	285.00	0.00
- Net cultivation cost	10322.63	10809.357	486.73
- Yeild per acre (kgs)	602.40	602.40	0.00
	-------Rs/40 kgs------		
- Cost of production at farm level			
- including land rent	685.43	717.75	32.32
- excluding land rent	568.12	598.23	30.11
- Marketing expenses	14.00	15.00	1.00
- Cost of production at market/ginnery:			
- including land rent	699.43	732.75	33.32
- excluding land rent	582.12	613.23	31.11

ANNEX-VII

ECONOMICS OF COTTON AND COMPETING CROPS AT PRICES REALIZED BY GROWERS: 2002-03 CROPS

Province/crops/ crop combinations	Crop duration	Water used	Gross cost	Cost of purchased inputs	Gross revenue	Gross margin	Net income	Output-input ratio	Revenue per		
									Rupee of Purchased inputs cost	Crop day	Acre inch of water used
1	2	3	4	5	6	7=6-5	8=6-4	9=6/4	10 = 6/5	11=6/2	12 = 6/3
	Days	Acre inches	----- Rupees per acre ------						------- Rupees ----------		
Punjab											
1. Cotton	240	22	13161	5724	15026	9302	1865	1.14	2.63	62.61	683.00
2. Basmati paddy	180	58	10185	5805	11483	5678	1298	1.13	1.98	63.79	197.98
3. IRRI paddy	180	62	8787	4882	7910	3028	-877	0.90	1.62	43.94	127.58
4. Wheat	180	17	9213	4159	8232	4073	-981	0.89	1.98	45.73	484.24
5. Sunflower (spring)	144	22	7237	2261	9255	6994	2018	1.28	4.09	64.27	420.68
6. Cotton+ wheat	420	39	22374	9883	23258	13375	884	1.04	2.35	55.38	596.36
7. Cotton+sunflower	384	44	20398	7985	24281	16296	3883	1.19	3.04	63.23	551.84
8. Basmati paddy+wheat	360	75	19398	9964	19715	9751	317	1.02	1.98	54.76	262.87
9. Basmati paddy+sunflower	324	80	17422	8066	20738	12672	3316	1.19	2.57	64.01	259.23
10 IRRI paddy+wheat	360	79	18000	9041	16142	7101	-1858	0.90	1.79	44.84	204.33
11 IRRI paddy+sunflower	324	84	16024	7143	17165	10022	1141	1.07	2.40	52.98	204.35
12 Sugarcane	394	48	17678	5707	16955	11248	-723	0.96	2.97	43.03	353.23
Sindh											
1. Cotton	240	18	10698	4285	12755	8470	2057	1.19	2.98	53.15	708.61
2. IRRI paddy	180	56	7281	3331	7440	4109	159	1.02	2.23	41.33	132.86
3. Wheat	180	15	7682	3232	7541	4309	-141	0.98	2.33	41.89	502.73
4. Sunflower (Spring)	144	22	7237	2261	9255	6994	2018	1.28	4.09	64.27	420.68
5. Cotton+wheat	420	33	18380	7515	20296	12781	1916	1.10	2.70	48.32	615.03
6. Cotton+sunflower	384	40	17935	6546	22010	15464	4075	1.23	3.36	57.32	550.25
7. IRRI paddy+wheat	360	71	14963	6563	14981	8418	18	1.00	2.28	41.61	211.00
8. IRRI paddy+sunflower	324	78	14518	5592	16695	11103	2177	1.15	2.99	51.53	214.04
9. Suagarcane	488	71	20883	8154	21024	12870	141	1.01	2.58	43.08	296.11

Notes for Annex-VII

1. The economic analysis presented in the above exercise is based on the input-output prices for 2002-03 crops.

2. The data regarding input-output parameters have been adopted from the APCom's support price policy papers for sugarcane, seed cotton, rice paddy and wheat, 2002-03 crops. However, the relevant data for sunflower and canola were adopted from the support price policy for non-traditional oilseeds, 2000-01 crops with necessary adjustments in input prices for updating costs and incomes for the 2002-03 crop. To incorporate the escalations in input prices which occurred during the growing period of 2002-03 crops, some marginal revisions have been made as under:

   2.1 The cost of supplementary irrigation for sugarcane has been adjusted in view of 21 per cent rise in power tariff and 26 per cent increase in diesel prices, for cotton in view of 20 percent increase in power tariff and 23 percent in diesel, for rice in view of 20 per cent in electric power and 22 per cent rise in diesel prices by June 2002 and for wheat in view of 14 per cent increase in power tariff and 6 percent rise in diesel prices by December 2002. The ratio of diesel and electric tubewells in the Punjab is 85 and 15 percent and in Sindh 28 and 72 percent. Based on these ratios, the expenses on supplementary irrigation have been revised by applying the weighted average increase in energy charges at 25 percent in Punjab and 22 percent in Sindh for sugarcane, at 23 percent in Punjab and 21 per cent in Sindh for cotton, at 22 percent in Punjab and 21 per cent in Sindh for rice and at 7 percent rise in Punjab and 12 percent in Sindh for wheat.

   2.2 The cost of fertilizers has been revised in view of their prices prevailed at the time of their application for the respective crops in 2002-03 season.

3. Water use has been estimated from the number of irrigations as reported in the cost of production estimates of the respective crops assuming each irrigation of 3 inches and 'rauni' of 4 inches.

4. The following prices as realized by the growers for different crops are adopted for the analysis:

   4.1 The 2002-03 wheat crop is yet to be harvested. Therefore the support price of wheat at Rs 300 per 40 kgs for 2002-03 crop has been adopted for the current analysis.

   4.2 The rice paddy is primarily transacted by the private sector at open market prices and no price was fixed by the Government. It has been reported by the Director, Crop Reporting Service, Department of Agriculture, Lahore that the super basmati occupies 70 per cent while basmati-385 accounts for 15 per cent of total rice area during the current crop season in the Punjab. Accordingly, the weighted average wholesale prices for basmati paddy during Oct-Dec 2002 in the major producer area markets calculate to Rs 495 per 40 kgs. The wholesale prices for IRRI paddy averaged at Rs 236 per 40 kgs during Oct-Dec 2002 in the Punjab. In Sindh, the

average wholesale market prices of IRRI paddy in the main producer area markets during the post-harvest months are reported at Rs 202 per 40 kgs in the APCom's field survey.

4.3 The wholesale market prices of seed cotton during the post-harvest months of Oct, 2002 to Jan, 2003 in the main producer area markets have averaged at Rs 899 per 40 kgs in the Punjab as reported by the Directorate of Agriculture (E&M), Lahore. In Sindh, the corresponding prices are reported at Rs 842 per 40 kgs by the PCCC, Karachi.

4.4 The 2002-03 sunflower crop is yet to be harvested. The market price of this crop is not regularly reported by any agency. However, it was reported by the PODB that the Solvent Extraction Plants would purchase sunflower at Rs 630 per 40 kgs and canola at Rs 560 per 40 kgs from the growers.

4.5 The market prices of sugarcane are not available from any agency. However, the mill-gate prices in the major cane producing areas are, by and large, reported around Rs 35 per 40 kgs in the Punjab and Rs 36 in Sindh by the farmers to the APCom's survey teams. The press reports also reflect a similar situation on prices of sugarcane.

5. The market prices have been adjusted for the marketing expenses to make them effective at the farm level. These expenses amount to Rs 5.00 per 40 kgs in Punjab and Rs 4.90 in Sindh for sugarcane, Rs 14 for seed cotton, Rs 12 for rice paddy and Rs 13 for wheat and oilseed crops.

6.	Gross income	=	(Yield per acre multiplied by price of principal produce at farm gate) plus (value of by-products per acre).
7.	Cost of purchased inputs	=	Cost incurred on seed and related items, fertilizer, supplementary irrigation including labour, canal water rate, pesticides and weedicides.
8.	Gross margin	=	Gross income minus cost of purchased inputs.
9.	Net income	=	Gross income minus gross cost.
10.	Output-input ratio	=	Gross income divided by gross cost
11.	Revenue per rupee of purchased inputs cost	=	Gross income divided by cost of purchased inputs
12.	Revenue per crop day	=	Gross income divided by crop duration in days.
13.	Revenue per acre-inch of water used	=	Gross income divided by irrigation water used in acre inches.

ANNEX-VIII

PROFITABILITY OF FERTILIZER USE ON SEED COTTON AT THE POST HARVEST MARKET PRICE FOR 2002-03 CROP

S.No	Item	Seed Cotton Nutrient Ratio of			
		3.00:1	3.75:1	4.50:1	5.25:1
		-------Kgs-------			
1	Yield increase due to use of additional 10 nutrient kgs of fertilizer per acre	30.00	37.50	45.00	52.50
		----------Rupees----------			
2.	Direct cost of 10 kgs of NPK fertilizer at the weighted average price of Rs 21.40 per nutrient kg (i.e. Rs 16.96, 24.23 and 27.44 per nutrient kg of N, P and K at the recommended NPK ratio of 2:1:1 (a)	214.00	214.00	214.00	214.00
3	Indirect cost due to the application of additional fertilizer as detailed below (b)	97.18	114.81	132.43	150.06
	3.1 Transportation and application charges of 19.15 kgs of fertilizer @ Rs 16.00 per bag of fertilizer	6.13	6.13	6.13	6.13
	3.2 Picking charges for additional produce @ Rs 80.00 per 40 kgs	60.00	75.00	90.00	105.00
	3.3 Marketing charges for additional produce @ Rs 14.00 per 40 kgs	10.50	13.13	15.75	18.38
	3.4 Mark up on direct cost of fertilizer (item 2+3.1) for 8 months @ 14% per annum	20.55	20.55	20.55	20.55
4	Total additional cost (item 2+3)	311.18	328.81	346.43	364.06
5	Value of additional produce @ Rs 766 per 40 kgs (c)	574.50	718.13	861.75	1005.38
6	Benefit cost ratio (item 5 divided by item 4)	1.85	2.18	2.49	2.76

Notes:

(a) The prices of N, P and K have been worked out from average of the prices of Urea, DAP and SOP used in COP estimates of the Punjab and Sindh for 2001-02 crop taken respectively as Rs 390, 710 and 686 per bag of 50 kgs each.

(b) The rates of indirect cost items are the average of the rates used in the COP estimates of the Punjab and Sindh for 2002-03 Crop.

(c) Average of the market price of 2001-02 crop for different varieties exclusive of "Desi" varieties for the period September, 2001 to January, 2002 have been used.

ANNEX- IX

CIF NORTH EUROPE PRICES OF VARIOUS COTTONS:1991-92 to 2002-03

Years Aug-Jul	Sindh/ Punjab Afzal 1-1/32"	Index- B Cottons	Orleans/ Texas Middling SLM 1-1/32"	Difference between Sindh/ Punjab Afzal 1-1/32"	
				Index- B Cottons	Orleans/Texas SLM 1-1/32"
	---------- US Cents per pound ----------				
1991-92	58.23	58.44	62.06	-0.21	-3.83
1992-93	53.95	53.60	57.44	0.35	-3.49
1993-94	58.25	67.35	68.82	-9.10	-10.57
1994-95	73.82	92.34	95.82	-18.52	-22.00
1995-96	82.17	81.19	88.02	0.98	-5.85
1996-97	75.83	74.85	77.22	0.98	-1.39
1997-98	72.28	71.00	72.16	1.28	0.12
1998-99	51.28 *	54.30	67.46	-54.30	-67.46
1999-00	47.23	49.55	50.19	-2.32	-2.96
2000-01	56.78	53.70	53.57	3.08	3.21
2001-02	38.41	38.95	39.05	-0.54	-0.64
2002-03 (Aug-Jan)	47.40	47.93	47.76	-0.53	-0.36
August	45.50	46.09	47.65	-0.59	-2.15
September	45.50	46.35	45.94	-0.85	-0.44
October	45.63	45.90	45.25	-0.27	0.38
November	47.65	47.95	48.20	-0.30	-0.55
December	48.75	49.30	48.92	-0.55	-0.17
January	51.35	52.00	50.60	-0.65	0.75

Note * Not quoted during the year, however, interpolated from the historical differential data.

Sources:

1. Upto 1995-96: Support Price Policy for Seed Cotton, 1997-98 Crop.
2. For 1996-97: Reuters.
3. For 1997-98: (i) Cotton Outlook (various issues) for Sindh/Punjab Afzal 1-1/32".
   (ii) Index - B Cottons
4. For 1999-00 to 2001-02 Cotton Outlook (various issues).
5. For Orleans Texas SLM 1-1/32" from 1992- 93 to 2002-03 Cotton Outlook (various issues).

ANNEX-X

PRICE OF SEED COTTON AS WORKED BACK FROM COTTON YARN (21's) PRICE AT KARACHI (AUGUST, 2002 TO JANUARY, 2003)

		Rupees
1	Average price of cotton yarn (20's) per bundle of 4.54 kgs	419.00
2	Average price of cotton yarn (20's) per kg	92.29
3	Recovery from sale of 0.16 kgs of cotton waste	1.34
4	Conversion charges from lint to yarn per kg	30.00
5	Value of 1.16 kgs of lint (item 2 + 3 minus item 4) (a)	63.63
6	Value of one kg of lint (item 5 divided by 1.16)	54.85
7	Value of 40 kgs lint	2194.16
8	Sales tax @ 15 % of item 9	286.20
9	Net value of 40 kgs lint after deducting sales tax (item 7 minus 8)	1907.97
10	Storage and transport cost from gin to mill per 40 kgs	40.00
11	Ex-gin price of 40 kgs lint (item 9 minus 10)	1867.97
12	Value of 80 kgs of cotton seed (b)	814.00
13	Ginning charges for 120 kgs seed cotton	250.00
14	Seed cotton price for 120 kgs (item 11+12 minus item 13) (c)	2431.97
15	Seed cotton price per 40 kgs (item 14 divided by 3)	810.66

Notes:

(a) 1.16 kgs of lint = 1 kg of yarn + 0.16 kgs of waste

(b) Average price of cotton seed for the period August, 2002 to January, 2003 at Multan market was Rs 407 per 40 kgs.

(c) 120 kgs of seed cotton = 80 kgs of cotton seed + 40 kgs of lint

Sources:

1 Karachi Cotton Association (KCA), Karachi.
2 Pakistan Central Cotton Committee (PCCC), Karachi.
3 Pakistan Cotton Ginner's Association (PCGA), Karachi
4 All Pakistan Textile Mills Association (APTMA), Karachi.

ANNEX- XI

EXPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM ACTUAL AVERAGE EXPORT PRICE OF PAKISTANI COTTON

S.No	Item	2002-03 Aug - Dec	1997- 98 to 2001-02
		US Cents per pound	
1.	Actual average export price	36.00	50.00
		OR Rupees (a)	
	Actual average export price per 40 Kgs	1842	2558
2.	Marketing expenses (export & purchase incidentals, insurance & financial expenses) per 40 Kgs	200	200
3.	Ex- gin price of lint per 40 Kgs (item 1- item 2)	1642	2358
4.	Value of 80 kgs of cotton seed (b)	814	814
5.	Ginning charges for 120 kgs of seed cotton	250	250
6.	Value of 120 kgs of seed cotton (c) (items 3 +4 - item 5)	2206	2922
7.	Seed cotton price per 40 kgs (item 6 / 3)	735	974

Notes

a) Buying exchange rate for import of one US $ = 58.01 Pak rupees, annouced by Habib Bank Ltd as on March, 1, 03.

b) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September , 2002 to January, 2003.

c) 120 kgs of seed cotton = 80 kgs of cotton seed + 40 kgs of lint.

Sources:

1. FBS , for export prices.
2. KCA, Karachi for marketing expenses.
3. Pakistan Cotton Ginners Association, Karachi for ginning charges.
4. Pakistan Central Cotton Committee, Karachi for cotton seed price.

ANNEX - XII

EXPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM THE CIF NORTH EUROPE QUOTATIONS OF INDEX B COTTONS AND PAKISTANI AFZAL 1-1/32"

S.No	Item	Index B Cottons		Afzal 1-1/32"	
		2002-03 Aug - Jan	1997-98 to 2001-02	2002-03 Aug - Jan	1997-98 to 2001-02
		---------- US Cents per pound ----------			
1	Average cif North Europe quotations	47.93	53.50	47.40	53.20
2.	Freight charges	5.50	5.50	5.50	5.50
3.	Export price (item 1 - item 2)	42.43	48.00	41.90	47.70
4.	Insurance, agents commission, and port handling charges @ 4% of export price	1.70	1.92	1.68	1.91
5.	Net export price (item 3 - item 4)	40.73	46.08	40.22	45.79
		OR ---------- Rupees (a) ----------			
		2084	2357	2058	2343
6.	Marketing expenses (export & purchase incidentals, insurance & financial expenses) per 40 kgs	200	200	200	200
7.	Ex- gin price of lint per 40 kgs (item 5 - item 6)	1884	2157	1858	2143
8.	Value of 80 kgs of cotton seed (b)	814	814	814	814
9.	Ginning charges for 120 kgs of seed cotton	250	250	250	250
10.	Value of 120 kgs of seed cotton (c) (items 7 + 8 - item 9)	2448	2721	2422	2707
11.	Seed cotton price per 40 kgs (item 10 / 3)	816	907	807	902

Notes:

a) Buying exchange rate for import of one US $ = 58.01 Pak rupees, annouced by Habib Bank Ltd as on March, 1, 03.

b) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September , 2002 to January, 2003.

c) 120 kgs of seed cotton = 80 kgs of cotton seed + 40 kgs of lint.

Sources:

1. Cif quotations calculated from Annex- IX.
2. KCA, Karachi for marketing expenses.
3. Pakistan Cotton Ginners Association, Karachi for ginning charges.
4. Pakistan Central Cotton Committee Karachi, for cotton seed price.

ANNEX- XIII

EXPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM THE FUTURE CONTRACT PRICE OF NEW YORK NO. 2 COTTON (AVERAGE OF OCTOBER, 2003, DECEMBER, 2003 AND MARCH, 2004)

S.No	Item	Prices calculations	
		US Cents per pound	
1.	Futures contract price as on March, 27, 2002	58.67	
2.	Grade and staple discount	4.60	
3.	Discount on account of inland transportation and certification of stocks	6.00	
4.	Parity price of Afzal 1-1/32" at Karachi	48.07	
		OR Rupees	(a)
	Parity price per 40 kgs	2459	
5.	Marketing expenses (export & purchase incidentials, insurance & financial expenses per 40 kgs	200	
6.	Ex- gin price of lint per 40 kgs (item 4 - item 5)	2259	
7.	Value of 80 kgs of cotton seed (b)	814	
8.	Ginning charges for 120 kgs of seed cotton	250	
9.	Value of 120 kgs of seed cotton (c) (items 6 + 7 - item 8)	2823	
10.	Seed cotton price per 40 kgs (item 9 / 3)	941	

Notes

a) Buying exchange rate for import of one US $ = 58.01 Pak rupees, annouced by Habib Bank Ltd as on March, 1, 03.

b) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September , 2002 to January, 2003.

c) 120 kgs of seed cotton = 80 kgs of cotton seed + 40 kgs of lint.

Sources:

1. Cotton Outlook of Jan, 31, 2003 for future contract price.
2. KCA, Karachi for marketing expenses.
3. Pakistan Cotton Ginners Association, Karachi for ginning charges.
4. Pakistan Central Cotton Committee, Karachi for cotton seed price.

ANNEX - XIV

EXPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM THE AVERAGE FOB PRICE OF PAKISTANI COTTON YARN (20'S)

S.No	Item	2002-03 Aug - Jan	1997- 98 to 2001-02
		US Cents per kg	
1.	Average fob price	155.00	195.70
		OR Rupees	(a)
		90	114
2.	Fob expenses per kg (transport cost, wharfage, port handling & forwarding, adhesive & EDS)	2	2
3.	Export packing cost per kg	1	1
4.	Value of 1 kg yarn (item 1 - (items 2 + 3)	87	111
5.	Recovery from 0.16 kgs cotton waste	1	1
6.	Conversion charges of lint into yarn per kg	30	30
7.	Value of 1.16 kgs cotton lint (b) (items 4 +5 -item 6)	58	82
8.	Price of one kg cotton lint (item7/1.16)	50	70
	OR		
	Price of 40 kgs cotton lint	1997	2811
9.	Transport cost from ginnery to mill, local tax(per 40kgs)	40	40
10.	Ex-gin price of 40 kgs lint (item 8 - item 9)	1957	2771
11.	Value of 80 kgs cotton seed (c)	814	814
12.	Ginning charges for 120 kgs of seed cotton including ginning losses	250	250
13.	Seed cotton price of 120 kgs (item10+11- item12) (d)	2521	3021
	OR		
14.	Seed cotton price per 40 kgs (item 13/3)	840	1007

Notes

a) Buying exchange rate for import of one US $ = 58.01 Pak rupees, annouced by Habib Bank Ltd as on March, 1, 03.

b) 1.16 kgs of lint = 1 kg of waste'

c) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September , 2002 to January, 2003.

d) 120 kgs of seed cotton = 80 kgs of cotton seed + 40 kgs of lint.

Sources:

1. Cotton Outlook for fob prices (various issues).
2. APTMA, Karachi for items, 2, 3 and 9.
3. Annex X for items 5 and 6.
4. Pakistan Cotton Ginners Association, Karachi for ginning charges.
5. Pakistan Central Cotton Committee Karachi, for cotton seed price.

ANNEX- XV

IMPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM THE AVERAGE QUOTED CIF NORTH EUROPE PRICE OF ORLEANS/ TEXAS SLM 1-1/32"

S. No	Item	2002-03 Aug - Jan	1997-98 to 2001-02
		US cent per pound	
1.	Average cif North Europe quotations	47.76	56.43
2.	Freight charges	5.50	5.50
3.	Forwarding charges @ 1.5% cif (North Europe Quotations)	0.72	0.85
4.	Cif (Karachi) price	53.98	62.78
5.	Insurance, agents commission, and port handling charges @ 1.5% of cif (Karachi) price	0.81	0.94
6.	Landed cost at Karachi	54.79	63.72
		OR Rupees per 40 kgs (a)	
7.	Net cif (Karachi) price	2812	3271
8.	Handling charges at port and transport cost from port to textile at Karachi @ 2.5 % of cif price	70	82
9.	Ex- gin price of lint (item 7 + item 8)	2883	3353
10.	Value of 80 kgs of cotton seeds (a)	814	814
11.	Ginning charges for 120 kgs of seed cotton including ginning losses	250	250
12.	Value of 120 kgs of seed cotton (item 9 +item 10 - item 11)	3447	3917
13.	Seed cotton price per 40 kgs (item 12/ 3)	1149	1306

Notes:

a) Selling exchange rate for importsof one US $ = 58.21 Pak rupees, annouced by Habib Bank Ltd as on March 1, 2003.

b) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September, 2002 to January, 2003.

Sources:

1. Cif (Noth Europe) price Annex - IX.
2. KCA, for incidentals chrges.
3. Pakistan Cotton Ginners Association for ginning charges.
4. Pakistan Central Cotton Committee, Karachi for cotton seed price

ANNEX- XVI

IMPORT PARITY PRICE OF SEED COTTON AS WORKED BACK FROM THE ACTUAL AVERAGE CIF (KARACHI) PRICE OF IMPORTED COTTON

S. No	Item	2002-03 Aug - Dec	1997-98 to 2001-02
		Rupees per 40 kgs	
1.	Actual average cif (Karachi) price	2775	3067
2.	Handling charges at port and transport cost from port to textile mill at Karachi @ 2.5 % of cif price	69	77
3.	Ex- gin price of lint (Item 1+ item 2)	2844	3144
4.	Value of 80 kgs of cotton seeds (a)	814	814
5.	Ginning charges for 120 kgs of seed cotton including ginning losses	250	250
6.	Value of 120 kgs of seed cotton (item 3 +item 4 - item 5)	3408	3708
7.	Seed cotton price (item 6/ 3)	1136	1236

Note: a) At the average price of Rs 407 per 40 kgs of cotton seed in Multan market during September, 2002 to January, 2003.

Sources:
1. FBS, for cif (Karachi price).
2. KCA, for incidentals charges.
3. Pakistan Cotton Ginners Association for ginning charges.
4. Pakistan Central Cotton Committee, Karachi for cotton seed price.

ANNEX-XVII

ECONOMIC EFFICIENCY OF RESOURCE USE IN SEEDCOTTON POLICY ANALYSIS MATRIX (PAM) FOR AVERAGE FAMERS (BASED ON EXPORT PARITY PRICES)

Description	Revenues	Traded cost	Domestic Factors Cost	Profits
	--------- Rupees per acre ---------			
PUNJAB				
1999-2000				
Private Prices	10191	4544	5376	272
Social Prices	10331	4238	4967	1127
Transfers	-140	306	409	-855
2000-01				
Private Prices	15182	4950	6307	3925
Social Prices	14126	4579	5814	3732
Transfers	1057	371	492	193
2001-02				
Private Prices	13572	5670	6825	1077
Social Prices	11241	4615	6254	372
Transfers	2331	1055	571	705
2002-03				
Private Prices	15043	5780	7114	2149
Social Prices	16016	4784	6546	4686
Transfers	-973	996	568	-2537
Average prices				
Private Prices	13509	5780	7114	615
Social Prices	12940	4745	6542	1652
Transfers	569	1035	572	-1038
SINDH				
1999-2000				
Private Prices	9579	4047	4604	928
Social Prices	9388	3755	4320	1314
Transfers	191	292	284	-386
2000-01				
Private Prices	13389	4230	5194	3966
Social Prices	12802	3907	4851	4044
Transfers	587	323	343	-78
2001-02				
Private Prices	12305	4512	5784	2009
Social Prices	10212	3656	5366	1190
Transfers	2093	856	418	819
2002-03				
Private Prices	12860	4585	6017	2259
Social Prices	14502	3836	5614	5052
Transfers	-1642	749	403	-2793
Average prices				
Private Prices	12047	4585	6017	1445
Social Prices	11739	3772	5608	2359
Transfers	308	813	409	-914

ANNEX-XVIII

ECONOMIC EFFICIENCY OF RESOURCE USE IN SEED COTTON
POLICY ANALYSIS MATRIX (PAM) FOR AVERAGE FARMERS
(BASED ON IMPORT PARITY PRICES)

Description	Revenues	Traded cost	Domestic Factors Cost	Profits
	---------- Rupees per acre ----------			
PUNJAB				
1999-2000				
Private Prices	10191	4544	5376	272
Social Prices	19247	4509	4992	9746
Transfers	-9056	34	384	-9474
2000-01				
Private Prices	15182	4950	6307	3925
Social Prices	19257	4691	5825	8742
Transfers	-4075	259	482	-4817
2001-02				
Private Prices	13572	5670	6825	1077
Social Prices	19895	4845	6276	8774
Transfers	-6322	825	549	-7696
2002-03				
Private Prices	15043	5780	7114	2149
Social Prices	19001	4856	6552	7593
Transfers	-3958	925	561	-5444
Average prices				
Private Prices	13509	5780	7114	615
Social Prices	19361	4917	6558	7886
Transfers	6467	1717	337	-7271
SINDH				
1999-2000				
Private Prices	9579	4047	4604	928
Social Prices	17395	4055	4348	8993
Transfers	-7816	-7	256	-8065
2000-01				
Private Prices	13389	4230	5194	3966
Social Prices	17410	4038	4863	8509
Transfers	-4021	192	331	-4544
2001-02				
Private Prices	12305	4512	5784	2009
Social Prices	17983	3919	5391	8673
Transfers	-5678	593	394	-6664
2002-03				
Private Prices	12860	4585	6017	2259
Social Prices	17182	3922	5622	7638
Transfers	-4322	662	395	-5379
Average prices				
Private Prices	12047	4585	6017	1445
Social Prices	17506	3971	5627	7908
Transfers	6467	1717	337	-6463

Notes for Annex-XVII and XVIII

Assumptions Entailed in the Estimation of Social Prices of Outputs and Inputs

Private Prices

These prices refer to those received by the producers for their commodities during their respective post harvest periods

Source: APCom's Support Price Policy for respective year

Social prices of

Outputs

These refer to export/import parity prices as worked out in the APCom's Support Price Policies for various crops and years.

Inputs

1) Seed

Cost of seed has been adjusted with the ratio between private and social prices of the commodities.

2. **Fertilizer**
Cost of fertilizers are net of import duty of 5 per cent and GST of 15 percent where applicable

3. **Plant Protection**

It has two components, pesticides/chemical (90 percent) and labour (10 percent). The former is net of import duty of 10 per cent and GST of 15 percent where it is applicable.

4. **Land Preparation Cost**

It involves use of tractor. The cost is apportioned into machinery (60 percent), fuel (20 per cent) and driver (20 per cent) Social cost of machinery is net of import duty of 30 percent and GST of 15 percent where it is applicable. The fuel cost has been adjusted with 10 per cent import duty and 15 percent GST. The 20 percent labour component being skilled has been valued at part with the wages paid in the market

5. **Tubewells**

Due to shortage of canal water, irrigation requirements have to be partially met from tubewell water. The machinery cost (tubewell) is apportioned into three components i.e. machinery (50 percent), fuel (40 percent) and labour (10 percent). Social cost of electric and diesel tubewells are net of taxes and duties as levied by the govt.

6. **Thresher**

It is driven by tractor and involves more labour than other operations. Tractor and thresher machines are assumed as 30 percent each and remaining 40 assigned as labour. Again machinery is supposed to be taxed by 30 percent. However, from the year 2000-01 onward labour cost became available as separate entity in the cost of production estimate. Therefore two machines are assumed 50 percent each. The social cost is net of Taxes.

7. **Labour**

Unskilled labour employed in most of the farming operations has been assumed to earn from alternatives only 75 percent of the wages paid in agriculture sector.

8. **Farm Yard Manure**

This input has been apportioned into material (30 percent), transport (30 percent) and labour (40 percent) have been taken as social prices.

9. **Canal Water**

Social cost of canal water has been taken from JMA's report and estimated @ 5 per cent per annum.

10. **Cost of Capital**

On the investment of the growers a mark up of 14 per cent has been added under social cost analysis.

ANNEX-XIX

REQUIREMENT AND SUPPLY OF CERTIFIED COTTON SEED BY THE PUBLIC AND PRIVATE SECTOR IN PUNJAB : 1992-93 TO 2002-03

Crop Year	Seed Certified at				Total	Total requirement	Area covered with certified seed
	NSC standard (a)		Relaxed standard (b)				
	Public	Private	Public	Private			
	---------- Thousand tonnes ----------						Per cent
1992-93	11.38	2.75	1.52	0.35	16.00	48.76	32.8
1993-94	6.60	2.65	1.29	0.68	11.22	44.98	24.9
1994-95	6.44	6.30	1.46	3.95	18.15	44.89	40.4
1995-96	8.43	6.74	3.68	5.79	24.64	49.27	50.0
1996-97	4.50	4.12	-	-	8.62	50.80	17.0
1997-98	7.20	7.50	0.24	5.68	20.62	46.97	43.9
1998-99	0.24	2.65	4.03	8.20	15.12	45.66	33.1
1999-00	0.24	2.88	3.97	6.35	13.44	46.59	28.8
2000-01	3.14	27.85	1.73	-	32.72	48.67	67.2
2001-02	3.30	16.83	-	-	20.13	51.23	39.3
2002-03	5.74	27.98	-	-	33.72	43.11	78.2

Notes: (a) National Seed Council (NSC) standards has minimum 70 percent germination and 98 per cent purity, and maximum 0.2 per cent off-types.

(b) The relaxed standard varied form year to year depending on the climatic and other specific conditions pertaining to each year.

(c) The total seed requirement for each year has been calculated @ 20 kgs/ha.

Source: Federal Seed Certification and Registration Department (FSC&RD), MINFAL, Islamabad.

ANNEX-XX

REQUIREMENT AND SUPPLY OF CERTIFIED COTTON SEED BY THE PUBLIC AND PRIVATE SECTOR IN SINDH : 1992-93 TO 2002-03

Crop Year	Seed Certified at				Total	Total requirement	Area covered with certified seed
	NSC standard (a)		Relaxed standard (b)				
	Public	Private	Public	Private			
	Thousand tonnes						Per cent
1992-93	0.57	-	-	-	0.57	11.92	4.8
1993-94	0.08	-	-	-	0.08	16.65	0.5
1994-95	0.07	-	-	-	0.07	12.17	0.6
1995-96	0.08	-	0.40	0.46	1.94	15.88	12.2
1996-97	-	0.30	-	-	0.30	18.04	1.7
1997-98	0.22	0.38	-	8.37	8.97	18.01	49.8
1998-99	0.05	-	0.05	23.17	23.27	18.91	123.1
1999-00	0.01	-	0.05	0.80	0.86	19.01	4.5
2000-01	-	0.63	-	0.46	1.09	15.71	7.0
2001-02	0.02	1.46	-	-	1.48	15.64	9.5
2002-03	-	2.08	-	-	2.08	16.28	12.8

Notes: (a) National Seed Council (NSC) standards has minimum 70 percent germination and 98 per cent purity, and maximum 0.2 per cent off-types.

(b) The relaxed standard varied form year to year depending on the climatic and other specific conditions pertaining to each year.

(c) The total seed requirement for each year has been calculated @ 30 kgs/ha.

Source: Federal Seed Certification and Registration Department (FSC&RD), MINFAL, Islamabad.

ANNEX-XXI

DISTRIBUTION OF COTTON SEED BY VARIETY IN THE PUNJAB AND SINDH: 2002-03

Province	Public Sector	Private Sector	Total	Area covered
	----------Tonnes---------			Per cent
Punjab				
NIAB-78	1665.0	13633.0	15298.0	35.48
CIM-446	1057.0	2682.5	3739.5	8.67
CIM-109	370.0	2946.0	3316.0	7.69
N.Karishma	1134.0	1591.0	2725.0	6.32
FH-109	378.5	2183.3	2561.8	5.94
FH-900	677.0	1818.4	2495.4	5.79
CIM-482	153.2	1198.0	1351.2	3.13
BH-36	102.0	587.4	689.0	1.60
BH-118	28.0	499.7	527.7	1.22
CIM-443	67.0	325.7	392.7	0.91
SLS-1	-	264.5	264.5	0.61
CIM-240	-	204.5	204.5	0.47
CIM-473	112.8	27.3	140.1	0.32
CIM-448	-	11.0	11.0	0.03
FVH-53	-	4.0	4.0	0.01
Total	5744.5	27976.6	33721.1	78.21
Sindh				
NIAB-78	0.0	2073.0	2073.0	12.73
CRIS-9	0.0	4.0	4.0	0.02
Total	0.0	2077.0	2077.0	12.76

Source: FSC&RD, Islamabad.
Note: Rounding of figures may cause in slight differences in total.