APCOM SERIES No. 194

SUPPORT PRICE POLICY

FOR

SEED COTTON, 2001-2002 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 of the Cabinet
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)
KCA	:	Karachi Cotton Association
MINFAL	:	Ministry of Food, Agriculture and Livestock
MOC	:	Ministry of Commerce
NCL	:	No Control Limit
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, 2001-02 CROP

Introduction

Cotton, the silver fibre, is the largest cash crop and main source of foreign exchange earnings in Pakistan. It is grown on an area of around 3 million hectares, accounting for 13 per cent of total cropped area. The share of cotton in value added by major crops is about 30 per cent. Cotton farming is the principal source of raw material for the textile industry, employing about 40 per cent of the industrial labour. About 60 per cent of the foreign exchange earned from merchandize exports comes from cotton and its made ups.

2. The domestic mill use of cotton had increased from 3 million bales in 1985-86 to 9.6 million bales in 1998-99 as number of spindles increased from 4.4 million to 8.4 million. The yarn production during this period increased from 482 million kgs to 1,540 million and cloth production expanded from 253 million to 385 million square meters. The consumption of cotton is expected to reach 10.8 million bales in 2000-01.

3. The cotton production during the decade ending 2000-01 passed through many ups and downs. In 1991-92, 1995-96, 1999-00 and 2000-01, cotton production crossed 10 million bales, reaching 12.8, 10.6, 11.2 and 10.5 million bales, respectively. On the other hand in 1993-94, 1994-95 and 1998-99 production remained under 9 million bales, primarily due to severe infestation of CLCV and pest flare up. With concerted efforts aimed at the development of CLCV resistant varieties and improved technology, the problem has been overcome to a large extent.

4. The large variations in cotton production have adversely affected the farmers' well being and other sub-sectors of the economy dependent on the crop. There is an urgent need to maintain cotton production at a level which not only caters for the increasing domestic requirements but also provides surplus for the exports. The provision of improved technology, conducive economic environment, assuring producer prices at a reasonable level can play a crucial role in this context.

5. To reduce price risk, the Government instituted the support prices for seed cotton and lint in 1976-77 which have continued although implementing mechanism has experienced drastic changes overtime. From 1996-97 to 1998-99, support prices for lint were not fixed. Since 1999-00 TCP has been involved in implementing the support prices for cotton. The cotton policy for 2000-01 crop as announced by the Ministry of Commerce is summarized below:

- TCP shall definitely enter the market and lift such quantities of phutti/lint as necessary when the price of phutti falls below Rs 725 per 40 kg. for premium quality of phutti. However, later on this price was announced to apply to base grade.

- Exports by private sector as well as TCP will be allowed right from the beginning of the season. All export contracts will have to be registered with the EPB.

- Such profits as may accrue to TCP will be used essentially to look after growers' interests. It will not be used for TCP's other functions/operations.

- Imports will continue to be allowed as per existing rules and procedures. These will, however, be subject to review in the textile policy by the Ministry of Commerce in order to ensure that Pakistani cotton growers are not placed at a disadvantage, while providing a level playing field.

- Ministry of Food and Agriculture have agreed to introduce cotton grading and standardization system at ginning stage w.e.f. 30-6-2000. This will contribute to better quality and bring about a better linkage between prices and quality.

6. In formulating support price policy proposals for the 2001-02 crop, APCom adopted the following procedure.

- 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 was conducted in January, 2001.

- During the field survey, the problems and constraints faced by the growers in the production and marketing of cotton were also discussed.

- 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.

- The annual meeting of APCom's Standing Committee on Cotton was convened on 26th February, 2001 at Multan. Progressive growers, ginners, traders, cotton experts, representatives of textile industry, federal and provincial governments and farmers' organizations attended the meeting. The meeting discussed, at length, the issues faced by cotton growers and the allied sub-sectors. The discussions were helpful in crystallizing the policy issues facing the cotton sub-sectors and a number of measures to improve the situation emerging from the discussion have been reflected in the Report.

7. In the wake of impending water shortage and rising input prices, risk in farm production in general and cotton farming in particular has increased. Adoption of improved technology and crop husbandry practices can help to lower the risk in production. However this would require a conducive environment for investments in crop production technology. Fixation of support prices of seed cotton to provide a floor to the market prices backed by institutional arrangements to implement the price policy will provide right signals to the growers of Government's concern in this context. There is considerable scope for improving the efficiency of production and marketing systems of seed cotton. Accordingly, a number of recommendations in addition to the fixation of support price are made for the consideration of the Government.

(Dr. Abdul Salam)
Member (Economics)

March 19, 2001.

2. SUMMARY OF FINDINGS AND RECOMMENDATIONS

2.1 Findings

Provincial Shares in Area and Production

8. The Punjab and Sindh are major cotton producing provinces. Punjab accounts for 78 per cent in area and 76 per cent in production.

Important Cotton Producing Districts

9. Districts of R.Y.Khan, Bahawalpur, Vehari, Bahawalnagar, Lodhran, Khanewal, Rajanpur, Multan, Muzaffargarh and Sanghar among themselves contribute 68 per cent of the total cotton production.

Area, Yield and Production

- **Long-term changes: 1990-91 to 2000-01**

10. During the period of 1990-91 to 2000-01, average annual growth in cotton production at country level has been negligible although area has expanded @ one per cent per year but yield declined @ 0.8 per cent. Punjab province has experienced negative growth of 2.2 per cent per annum in yield which has offset the impact of 0.6 per cent annual expansion in area. The performance of cotton crop in the Punjab influences the cotton situation at country level due its heavy weightage.

- **Short-term changes: 2000-01 vs 1999-00**

11. According to the Second estimates, cotton production from 2000-01 crop is expected at 10.5 million bales which is 6.3 per cent short of the production from 1999-00 crop reported at 11.2 million bales. Decrease in production is due to 1.7 per cent contraction in area and 4.7 per cent fall in yield. Production in the Punjab reported at 8.3 million bales is less by 5.3 per cent over 8.8 million bales picked in 1999-00. Decrease in production is due to 7.6 per cent fall in

yield as the area exceeded the last years level by 2.5 per cent. In Sindh production is down by 9.9 per cent entirely due to 17.4 per cent contraction in area as yield has improved by 9.0 per cent.

Targets Vs Achievements: 2000-01 Crop

12. According to the Second estimates cotton production from the 2000-01 crop reported at 10.5 million bales has exceeded the target set at 8.5 million bales. Excess production is primarily attributable to 8.5 per cent over achievement in yield. In the Punjab production of 8.3 million bales has surpassed the target of 7.5 million bales by 11.1 per cent. Excess achievements in terms of area and yield have been 3.8 and 7.0 per cent. In Sindh production of 2.1 million bales is short of the target of 2.2 million bales by 2.7 per cent. Under achievement in production is primarily due to 16.9 per cent shortfall in area as yield target was surpassed by 17.2 per cent.

Domestic Demand, Supply and Stocks

13. The cotton year 2000-01 (September-August) started with carry over stocks of 3.036 million bales. Imports of 0.224 million bales were reported by the mid February 2001. With the 2000-01 production of 10.528 million bales, total supplies of cotton lint during 2000-01 may reach 13.788 million bales. About 0.517 million bales have been exported. The gross domestic consumption, both for mill and non-mill use, are estimated at 10.800 million bales. Thus, end year stocks should be around 2.471 million bales.

Average Wholesale Prices of:

- **Seed cotton (phutti)**

14. Monthly average wholesale prices of seed cotton (phutti) during 2000-01 crop season have ranged from Rs 696 to Rs 1061 per 40 kgs in the Punjab and between Rs 780 and 949 in Sindh.

- **Cotton lint**

15. Monthly average spot rates of cotton lint at Karachi for "Base Grade with staple length of 1-1/32" and mike values ranging between 3.8 – 4.9 NCL during the 2000-01 cotton season have ranged between Rs 2,375 and Rs 3,056 per 40 kgs.

Cost of production

- **Punjab**

16. Based on the average yield of 671 kgs per acre, ex-farm cost of production of seed cotton for the 2001-02 crop in the Punjab works out to Rs 734 per 40 kgs. Adding the marketing cost @ 14 per 40 kgs, the cost at ginnery/procurement level would be Rs 748, reflecting an increase of Rs 78 or 12 per cent over the corresponding cost of Rs 670 in 2000-01 crop year.

- **Sindh**

17. Based on the average yield of 620 kgs per acre, farm level cost of production of seed cotton in Sindh during 2001-02 is estimated at Rs 666 per 40 kgs. Accounting for marketing charges @ Rs 14 per 40 kgs, the COP at ginnery/market level comes to Rs 680 showing an increase of Rs 60 or 10 per cent over the previous year's cost estimated at Rs 620.

18. The increases in cost of production of seed cotton in the Punjab and Sindh for 2001-02 crop are primarily attributed to rises in the rates of cultural operations, cost of irrigation and prices of chemical fertilizers, plant protection, cost of management and picking the produce, land rents and marketing costs have also increased.

Comparative Economics of Cotton and Competing Crops

- **Punjab**

19. Cotton farming in the Punjab seems to enjoy a distinct edge over rice crops in terms of returns to overall investment, revenue per unit, each, of crop duration, irrigation and purchased inputs.

20. In case of indirect competition with sugarcane, cotton combinations with wheat or sunflower performed better than sugarcane in respect of revenue per day of crop duration and per acre-inch of irrigation water. However, sugarcane outranked cotton and its combinations in terms of output-input ratio and returns to purchased inputs.

- **Sindh**

21. Cotton cultivation , in Sindh like that in the Punjab, has a definite edge over IRRI paddy in terms of output-input ratio and revenue per unit, each, of crop duration, purchased inputs cost and irrigation water.

22. In case of indirect competition, cotton combinations out-competed sugarcane in respect of revenue per unit of irrigation. However, sugarcane performed better in terms of returns to overall investment and revenue per rupee of purchased inputs and per day of crop duration.

Economics of Fertilizer Use

23. To examine the overtime changes in the profitability in the use of N and P fertilizers on cotton, two parameters viz benefit cost ratio (BCR) and parity ratio between the market prices of fertilizer and seed cotton have been estimated.

Benefit Cost Ratio (BCR)

24. BCRs at various response ratios reflect a wide range during the decade ending 2000-01. These ratios were the highest in 1994-95 (i.e. 4.34 to 6.55 at response ratios of 3.0:1 to 5.25:1) and also quite attractive in 1992-93, 1995-96 and 1996-97 mainly due to remunerative prices of the produce. Afterwards, due to opposite trend in prices of seed cotton and those of fertilizers, BCRs started to decline and reached the lowest level during 1999-00 (1.66 to 2.51 at various response ratios). However, rise in the market prices of seed cotton during the post harvest season of 2000-01 crop improved the economics of fertilizer use in cotton as BCRs at various response ratios have increased from 2.51 to 3.71.

Parity Ratios Between Prices of Fertilizer and Seed Cotton

25. The fertilizer-crop price parity ratio refers to the units of produce required to buy one unit of fertilizer. Higher the parity ratio, lower the purchasing power. Parity ratios between the prices of seed cotton and fertilizer were higher in 1991-92 but fell in the following years implying improvement in the purchasing power of seed cotton in terms of both N and P fertilizers. The most favourable parity ratio in the period under consideration was noticed in 1994-95 when 0.5 and 0.55 units of seed cotton were required to purchase a nutrient unit of N and P, respectively. Afterwards, purchasing power of seed cotton deteriorated due to disproportionate increase in the fertilizer prices. In this context 1999-00 was the most unfavourble year (as market prices of cotton fell to unprecedented low level) as the parity ratio for N and P fertilizer increased to 0.98 and 1.61. However, the situation improved in favour of seed cotton in 2000-01 crop year when 0.62 and 0.98 units were required to buy a unit of N & P fertilizer respectively. These were about 40 per cent less compared with the previous year.

Nominal and Real Prices of Seed Cotton (Phutti)

- **Support Prices**

26. The nominal support price of seed cotton has increased from Rs 245 per 40 kgs in 1990-91 to Rs 725 per 40 kgs in 2000-01, an overall increase of 196 per cent. During the same period, the cumulative inflation in terms of CPI, has been 136 per cent. Consequently, the real value of the support price of seed cotton (phutti) for 2000-01 crop, estimated at Rs 307 per 40 kgs in terms of 1990-91 prices shows an increase of 25 per cent in relation to the corresponding price of Rs 245 for 1990-91 crop.

- **Market Prices**

27. The market prices of seed cotton (phutti) averaging at Rs 330 per 40 kgs in the Multan market during the harvest season of 1990-91 crop have since risen to Rs 957 per 40 kgs in 2000-01, showing an overall increase of 190 per cent. During the same period, the cumulative inflation in terms of CPI (1990-91=100) has been estimated around 136 per cent. Consequently,

the real value of market prices of seed cotton (phutti) for 2000-01 crop estimated at Rs 405 per 40 kgs in terms of 1990-91 prices, reflects an overall rise of 23 per cent in relation to the corresponding price in 1990-91 crop year.

Domestic Parity Prices

28. The price of seed cotton as worked back from the domestic price of cotton yarn (20's) at Faisalabad market during the months of September, 2000 to January, 2001 comes to Rs 848 per 40 kgs.

World Supply, Demand, Stocks and Trade

29. The world production of cotton during 2000-01 has been reported at 18.93 million tonnes. Adding the opening stocks of 8.93 million tonnes, total supply works out to 27.86 million tonnes. The global consumption of cotton is estimated at 19.88 million tonnes in 2000-01 leaving the end year stocks at 7.98 million tonnes. World trade (exports) in cotton for the same year is reported at 6.07 million tonnes. For 2001-02, the cotton production is projected at 19.98 million tonnes, 1.05 million tonnes more than that of 2000-01. Adding the opening stocks of 7.98 million tonnes, total supply of cotton in 2001-02 should be 27.96 million tonnes while consumption is forecast at 20.24 million tonnes. As the projected production in 2001-02 is less than consumption level, the end year stocks are forecast to decline to 7.74 million tonnes. Exports in 2001-02 are forecast at 6.24 million tonnes, which are 0.17 million tonnes higher than preceding year.

International Prices

30. The cif North Europe prices of Sindh/Punjab Afzal 1-1/32", Index-B cottons and Orleans Texas Middling 1-1/32" cotton during the period of 1990-91 to 2000-01 have exhibited violent fluctuations. The respective prices averaged at 76.82, 77.22, and 79.78 US cents per pound in 1990-91, declined to their lowest levels at 47.46, 49.28 and 52.35 cents in 1999-00. During 2000-01, (September to January) price of Afzal averaged at 57.60 cents per pound while those of Index B cottons and Orlean Taxes Middling averaged at 60.33 and 61.15 cents per pound, respectively.

Export/Import Parity Prices

31. Pakistan is a net exporter of cotton. During 1999-00 (Sep-Aug) it exported 575 thousand bales while imports were reported 496 thousand bales. Accordingly export/import parity prices of seed cotton have been worked out on various bases. Summary of both the parity prices is presented below to provide a reference for the opportunity cost of the produce.

Export/Import Parity Prices of Seed Cotton

Basis	Worked back prices of seed cotton at ginnery (Rs per 40 kgs)
Export Parity Prices	
1. Average actual export prices of Pakistani cotton:	
- During 2000-01 (Sep - Jan)	844
- During 1996-97 to 2000-01	1018
2. Average cif North Europe quotations of Index B Cottons:	
- During 2000-01 (Sep - Jan)	981
- During 1996-97 to 2000-01	1045
3. Average cif North Europe value of Pakistani cotton Afzal 1-1/32"	
- During 2000-01 (Sep – Jan)	936
- During 1996-97 to 2000-01	992
4. Future Contract prices of New York No.2 cotton for deliveries in October, December 2001 and March 2002:	958
5. Average fob price of Pakistani cotton yarn (20's)	
- During 2000-01 (Sep – Jan)	999
- During 1996-97 to 2000-01	1194
Import Parity Prices	
1. Average cif North Europe Price of Orleans/Texas Middling 1-1/32" During 2000-01 (Sep - Jan)	1367
2. Average actual cif Karachi price of imported cotton	1211

Sources: Annexes X to XVI.

2.2 Recommendations

2.2.1 The support price

32. On the basis of analysis carried out in this Report and summarized at paras-123 to 136, the support price for the 2001-02 seed cotton crop, for base grade 3 with staple length 1-1/32" and micronaire range of 3.8 – 4.9 NCL is recommended at Rs 780 per 40 kgs.

33. The proposed support price provides a margin of 4 to 15 per cent over the current cost of production.

34. In addition to above support price, following premium/discount rates are recommended for higher/lower grades and staple lengths.

Premia (+)/discounts (-) for higher/lower grades and staple lengths

(Rs per 40 kgs)

Grade	Staple length					
	31/32"	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
Super	N.Q	+25	+42	+59	+76	+94
One	N.Q	+10	+28	+45	+62	+80
Two	N.Q	- 2	+16	+33	+50	+67
Three	N.Q	-17	Base	+17	+34	+51
Four	-52	-35	-18	- 1	+16	+34
Five	-70	-53	-36	-19	- 2	+16

35. The discounts for the micronaire beyond specified limits as given in para-139 are also recommended.

36. The Ministry of Commerce may also announce the support price of lint and designate Trading Corporation of Pakistan, for implementing the support price well ahead of the season.

2.2.2 Improving productivity

Improved Seed

i) PSC should increase the supply of seed of CLCV resistant varieties and undertake aggressive marketing to enhance the sale of certified seed.

ii) Public and private seed distributing agencies be asked to multiply and distribute the seed of all important varieties recommended for cultivation especially in Sindh so that farmers in the province could benefit from the cotton research.

iii) Provincial Agricultural Extension Departments should educate growers to cultivate only the recommended varieties.

Integrated Pest Management (IPM)

i) The Government should strengthen its IPM institute for accelerating research and encourage the private companies for commercial rearing and marketing of useful insects and other predators.

ii) IPM institutes should also undertake research on microbial control of pests and introduce its findings among the growers for their adoption.

iii) Research work on the determination of effectiveness of growth regulators against bollworms of cotton should be completed expeditiously and results obtained may be disseminated for practical utility.

iv) Provincial Agricultural Departments should educate growers for the adoption of various IPM techniques.

Balanced Use of Plant Nutrients

37. Provincial Agricultural Research Institutes should be asked to develop various bio-fertilizers and area/crop specific fertilizer recommendations. Farmers be advised in the balanced use of fertilizer nutrients through electronic and other mass media.

2.2.3 Improving quality and marketing

- **Picking**

38. To improve and maintain quality of seed cotton, educational campaign informing the pickers about the proper methods of cotton picking, its timing and handling should be launched through all mass media.

- **Ginning**

39. A Ginning Research Institute needs to be established at Multan to deal with the issues of cotton grades and other problems relating to the quality of lint. It is understood that the Pakistan Cotton Ginners Association (PCGA) is ready to establish this institute provided the Government issues an SRO to allow them to levy a surcharge on the bales ginned in the ginneries under their control. The Government should authorize the PCGA in this context.

Underweighment and Undue Deductions

40. For checking malpractices in cotton marketing, the provincial governments should constitute supervisory committees consisting of representatives of local Market Committee, Agriculture Department, growers and cotton dealers.

Uniform Weighment Units

41. At present the seed cotton transactions are made in term of 40 kgs while the cotton lint transactions are reported in term of maunds creating a lot of confusion. The differential in measuring units also results in cheating of the growers by certain unscrupulous marketing functionaries as well. The KCA should introduce uniform measurement of 40 kgs for lint cotton with the collaboration of PCGA.

Payment According to Quality Grades

42. The Pakistan Textile Mills Association as a big buyer of cotton lint should encourage buying lint according to the grades and staple length as announced by KCA.

Reducing the Marketing Costs

43. The Pakistan Central Cotton Committee (PCCC) should conduct a study of the costs in marketing of cotton at various stages.

3. SOWING AND PICKING TIMES

3.1 Sowing

44. The recommended sowing times of cotton for various parts/districts of the Punjab and Sindh, the main cotton producing provinces, are given in Annex-1.

45. In Punjab two types of cottons viz Desi and American, are grown. The former type is sown in Sheikhupura, Mianwali, Khushab, Bhakkar and Bahawalnagar districts. The optimum sowing times in these districts is the month of April. The American cotton, comprising a number of varieties is grown in the central and lower districts of Punjab. In districts of Multan, Vehari, Muzaffargarh, D.G. Khan and Rajanpur sowing of cotton is recommended from first May to end of June. In R.Y. Khan, Bahawalpur, Bahawalnagar, Faisalabad, Jhang, Pakpattan, Sahiwal and Okara districts optimum sowing time is from first of May to 15th of June. In the rest of cotton growing districts, sowing is recommended from 15th May to 15 the June.

46. In Sindh, primarily, American cotton is grown, with sowing times extending from March to 10th of June. In Mirpurkhas and Umer Kot districts recommended time of cotton sowing is from first March to 15th April, whereas in Hyderabad and Sanghar districts it is from mid April to mid May. For Nawabshah district cotton sowing is recommended in the month of May. In Dadu, Khairpur, Sukkur and Ghotki districts cotton sowing is recommended from mid of May to 10th of June.

47. Cotton is also grown in some parts of D.I. Khan in the of NWFP, where its sowing from 3rd week of April to end of May gives better results.

3.2 Picking

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

4. PROVINCIAL SHARES IN AREA AND PRODUCTION

49. On the basis of 1997-98 to 1999-00, the average area under cotton works out to 2955 thousand hectares (6515 thousand acres) with average production of 9.7 million bales. The provincial shares in cotton area and production are given in Table-1.

Table-1: Provincial Shares in Area and Production of Cotton: (Average of 1997-98 to 1999-00)

Country/Province	Area		Production	
	000 hectare	Per cent	000 bales	Per cent
Pakistan	2955.2	100.0	9738.0	100.0
Punjab	2320.2	78.5	7416.3	76.2
Sindh	621.3	21.0	2282.3	23.4

Source: Worked out from data in Annex-II.

50. The Punjab and Sindh are major cotton producing provinces. The province of Punjab accounts for 78 per cent of the area and 76 per cent of cotton production. The provincial shares are also depicted in Figures 1 and 2.

5. IMPORTANT COTTON PRODUCING DISTRICTS

51. Cotton producing districts have been arranged in descending order of production in Annex-IV.

52. Important cotton producing districts are R.Y.Khan, Bahawalpur, Vehari, Bahawalnagar, Lodhran, Khanewal, Rajanpur, Multan, Muzaffargar, D.G.Khan, Sahiwal, Pakpattan, Jhang, T.T.Singh, Layyah, Faisalabad and Okara from the Punjab; and Sanghar, Ghotki, Nawabshah, Khairpur, Hyderabad, N.Feroze, Mirpurkhas, Sukkur and Umerkot from Sindh. These 26 districts collectively account for 99 per cent of cotton production in country.

53. Districts of R.Y.Khan, Bahawalpur, Vehari, Bahawalnagar, Lodhran, Khanewal, Rajanpur, Multan, Muzaffargarh and Sanghar among themselves contribute 68 per cent of the total cotton production.

PROVINCIAL SHARES IN AREA & PRODUCTION OF COTTON : AVG OF 1997-98 TO 1999-00

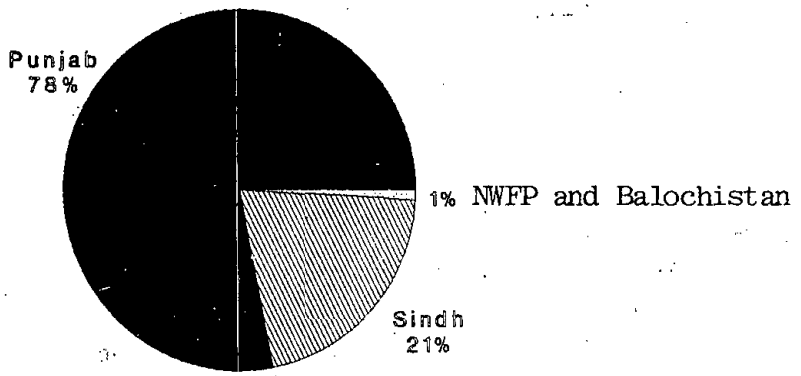

Fig-1: SHARES IN AREA

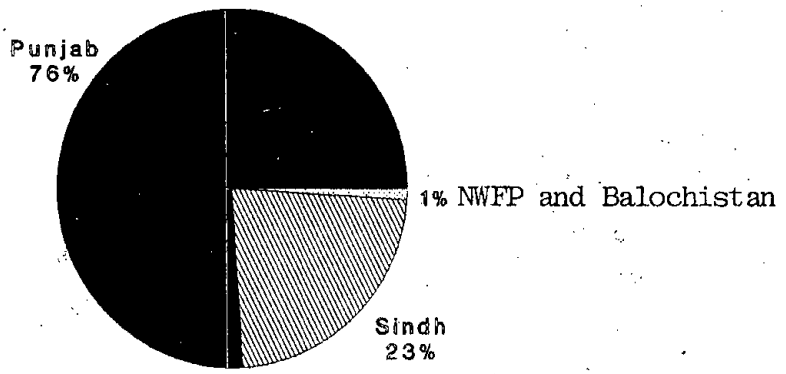

Fig-2: SHARES IN PRODUCTION

6. AREA, YIELD AND PRODUCTION

54. During the decade ending 2000-01, area under cotton has varied between 2653 and 3149 thousand hectares (5849 to 6943 thousand acres). The yield (lint) during this period fluctuated between 488 and 769 kgs per hectare (221 to 349 kgs per acre) while cotton production ranged from 8 to 12.8 million bales. The changes in area, yield and production, in the long as well short run, are discussed below:

6.1 Long-term Changes: 1990-91 to 2000-01

55. During the period of 1990-91 to 2000-01, average annual growth in production of cotton, at country level, has been negligible although area expanded @ one per cent per year. Since the yield declined @ 0.8 per cent per annum (Table-2), gains realized from expanding cotton area were offset to a large extent.

Table-2: Average Annual Growth Rates of Area, Yield and Production of Cotton: 1990-91 to 2000-01

Country/Province	Area	Yield	Production
	---------- Per cent per annum ----------		
Pakistan	(+) 1.0	(-) 0.8	(+) 0.2
Punjab	(+) 0.6	(-) 2.2	(-) 1.6
Sindh	(+) 2.2	(+) 6.8	(+) 9.2
NWFP	(-) 6.7	(+) 1.3	(-) 5.5
Balochistan	(+)74.9	(+) 1.5	(+)77.5

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.

56. The Punjab province accounting for over 75 per cent of the total production of cotton has experienced a negative growth rate of 2.2 per cent per year in the cotton yield during the period under reference. This has more than offset the impact of 0.6 per cent annual expansion in area. The performance of cotton crop in the Punjab, due to its higher weightage in the total production also influenced the cotton situation at the national level.

57. In Sindh cotton production has been increasing @ 9.2 per cent per annum on account of 2.2 per cent expansion in area, and 6.8 per cent improvement in yield.

6.2 Short Term Changes: 2000-01 vs 1999-00

58. According to the Second estimates, cotton production from the 2000-01 crop is expected at 10.5 million bales, which is 6 per cent short of the production from 1999-00 crop, reported at 11.2 million bales (Table-3). Decrease in production is attributable to 1.7 per cent contraction in area and 4.7 per cent fall in yield.

Table-3: Area,Yield and Production of Cotton: 1999-00 and 2000-01 Crops

Province/ Country	Area		Changes in 2000-01 over 1999-00	Yield kgs/hectare		Changes in 2000-01 over 1999-00	Production		Changes in 2000-01 over 1999-00
	1999-00	2000-01		1999-00	2000-01		1999-00	2000-01	
	000 hectare		Per cent	Kgs/hectare		Per cent	000 bales		Per cent
Pakistan*	2983.1 (7371.5)	2931.8 (7244.8)	(-) 1.7	641	611	(-) 4.7	11240.0	10528.1	(-) 6.3
Punjab	2329.3 (5755.9)	2386.4 (5897.0)	2.5	643	584	(-) 7.6	8804.0	8336.0	(-) 5.3
Sindh	633.5 (1565.4)	523.6 (1293.9)	(-)17.4	638	696	(+) 9.1	2377.4	2141.1	(-) 9.9

Note:

* Includes NWFP and Balochistan also.

Source: Annex-II.

59. In the Punjab production from the 2000-01 crop is estimated at 8.3 million bales, which is 0.5 million bales (5.3 per cent) short of the 8.8 million bales picked in 1999-00. The decrease in production is solely due to 7.6 per cent fall in yield as area has exceeded the last year's level by 2.5 per cent. In Sindh production is down by 9.9 per cent, entirely due to 17.4 per cent contraction in area as yield has improved by 9.0 per cent.

7. TARGETS VS ACHIEVEMENTS: 2000-01 CROP

60. FCA had set cotton production target, for the 2000-01 crop, at 9.7 million bales. Actual production as per Second estimates reported at 10.5 million bales has exceeded the target by 8.5 per cent (Table-4). Excess production is primarily due to 8.5 per cent over achievement in yield target.

Table-4: Targets and Estimated Achievements of Area, Yield and Production of Cotton: 2000-01 Crop

Country/ Province	Area			Yield			Production		
	Targets	Achieve-ments	Deviation from target	Targets	Achieve-ments	Deviation from target	Targets	Achieve-ments	Deviation from target
	000 hectare		Per cent	Kgs per hectare		Per cent	000 bales		Per cent
Pakistan*	2930.0 (7240.3)	2931.8 (7244.8)	(+) 0.1	563	611	(+) 8.5	9700.0	10528.1	(+) 8.5
Punjab	2300.0 (5683.5)	2386.4 (5887.0)	(+) 3.8	555	584	(+) 7.0	7500.0	8336.0	(+) 11.1
Sindh	630.0 (1556.8)	523.6 (1293.9)	(-)16.9	584	698	(+) 17.2	2200.0	2141.1	(-) 2.7

Note:

* Includes NWFP and Balochistan also.

Sources:

1. For targets: Minutes of the 73rd Meeting of FCA held on 31-10-2000.
2. Annex-II.

61. In the Punjab production of 8.3 million bales has surpassed the target of 7.5 million bales by 11.1 per cent. Excess achievements in terms of area and yield have been 3.8 and 7.0 per cent.

62. In Sindh production of 2.1 million bales is short of the target, of 2.2 million bales, by 2.7 per cent. Under achievement in production is due to 16.9 per cent less shortfall in area. The yield, however, has surpassed the target by 17.2 per cent.

8. DETERMINANTS OF SUPPORT PRICE

63. The following factors have been considered and analyzed in formulating price policy proposals of seed cotton (phutti), for the 2000-01 crop.

8.1 Domestic supply, demand, stocks and price situation
8.2 Cost of production of seed cotton
8.3 Comparative economics of cotton & competing crops
8.4 Economics of fertilizer use on cotton
8.5 Nominal and real prices of seed cotton
8.6 Domestic parity prices of seed cotton
8.7 World supply, demand, stocks, trade and price situation
8.8 Export parity prices of seed cotton
8.9 Import parity prices of seed cotton

8.1 Domestic Supply, Demand, Stocks and Price Situation

8.1.1 Domestic supply, demand and stocks

64. Data on domestic production, consumption, imports, exports and stocks of cotton (lint) for the years 1998-99 to 2000-01 are presented in Table-5.

Table-5: Domestic Supply, Demand, Stocks of Cotton (Lint): 1998-99 to 2000-01 (September-August)

S.No.	Item	1998-99	1999-2000	2000-01 (Estimated)
		---- Million bales [a] -----		
1.	Opening stocks[b] (on 1st September)	0.802	1.699	3.036
2.	Production	8.790	11.240	10.528
3.	Imports	1.678	0.496	0.224(c)
4.	Total supplies	11.270	13.435	13.788
5.	Consumption by	9.560	9.824	10.800
	i) Reporting mills	8.518	8.824	9.800
	ii) Non-reporting mills	0.542	0.500	0.500
	iii) Non-mill sector	0.500	0.500	0.500
6.	Exports	0.011	0.575	0.517[d]
7.	Closing stocks as on 31st August (item 4-5-6)	1.699	3.036	2.471

Notes:

(a) One bale = 170 kgs = 375 lbs.
(b) It includes stocks with textile mills and exporters except for 1999-2000 when stocks of 3 'lac' bales with ginners were also included.
(c) Upto February 17, 2001
(d) Upto February 15, 2001

Sources:

1. FBS, Karachi
2. KCA, Karachi

65. Table-5 reveals that cotton year, 1999-00 (September-August) started with opening stocks of 1.699 million bales. Adding domestic production of 11.240 million bales and imports of 0.496 million bales, total availability during the year 1999-00 worked out to 13.435 million bales. About 9.824 million bales were reportedly consumed domestically, by textile mills and non-mill sectors. Exports during 1999-00 were reported at 0.575 million bales bringing the end year stocks to 3.036 million bales.

66. According to the latest estimates, production from the 2000-01 crop is reported at 10.528 million bales. Adding opening stocks of 3.036 million and imports of 0.224 million bales (upto February 17, 2001) total cotton availability works out to 13.788 million bales. The gross domestic consumption is estimated at 10.800 million bales while exports (upto mid of February 2001) have been reported at 0.517 million bales. Thus, end year stocks should be around 2.471 million bales.

8.1.2 Price situation

8.1.2.1 Seed cotton (phutti) prices

67. Monthly average of wholesale prices of seed cotton (phutti) ruling in the markets of Okara, Multan, Rahim Yar Khan and Hyderabad during the post harvest period (September to January) for the 2000-01crop are given in Table-6.

Table-6: Monthly Average Wholesale Prices of Seed Cotton (Phutti) in the Main Producer Area Markets During 2000-01 Crop Season

Markets	September	October	November	December	January	Average
	---------- Rupees per 40 kgs ----------					
Okara	696	828	937	962	960	877
Multan	716	833	969	1061	963	908
Rahim Yar Khan	732	919	1038	1024	858	914
Hyderabad	780	866	937	949	944	895
Average	731	862	970	999	931	899

Note: (-) Not available.

Sources:

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

68. From the data in Table-6, it appears that prices of seed cotton in the beginning of season were relatively low. However, during the peak of picking season i.e. October to January these ruled much higher than the support price of Rs 725/- per 40 kgs. In the Punjab, average monthly prices of seed cotton ranged between Rs 696 (in Okara in September, 2000) and Rs 1061 per 40 kgs (in Multan in December, 2000). In Sindh (Hyderabad market) prices ranged between Rs 780 and Rs 949 per 40 kgs.

8.1.2.2 Cotton (lint) prices

69. From July 1, 2000, Karachi Cotton Association (KCA) has switched over to announcing cotton prices according to grade and staple length replacing old system of pricing by variety. The daily spot rates of raw cotton are now issued for "Base Grade" with staple length of 1-1/32" and mike values ranging between 3.8 – 4.9 NCL (No Control Limit). The premia/discounts for upper/lower grades/staples are also announced. Monthly averages of spot prices of cotton (lint) at Karachi, for the period of September 2000 to February 2001, are presented in Table-7.

Table-7: Monthly Average Spot Prices of Cotton (Lint) at Karachi, 2000-01 Crop Season

Month	Base Grade-3 staple length 1-1/32", Micronaire Value between 3.8 to 4.9 NCL (No Control Limit)
	Rupees per 40 kgs*
September	2,375
October	2,641
November	2,900
December	3,245
January	3,056
February**	2,811

Notes:

* The prices quoted by KCA were in rupees per maund of 37.324 kgs which have been converted into Rs per 40 kgs. These prices also include 15 per cent sales tax and expenses from up-country @ Rs 54 per 40 kgs.

** Prices are upto February 17, 2001.

Source: Karachi Cotton Association (KCA), Karachi.

70. Table-7 reveals that cotton spot rates for "Base Grade" with staple length 1-1/32" and mike values ranging between 3.8 – 4.9 NCL during September, 2000 were comparatively much less. With the passage of time prices trended upward and continued rising upto December, when these averaged at Rs 3,245 per 40 kgs. In January, 2001, prices declined to Rs 3,056 per 40 kgs and continued the downward slide in February.

8.2 Cost of Production

71. Empirical estimation of cost of production, an important determinant of the support price of field crops, is beset with many conceptual problems and practical difficulties. The cultural practices, use level of inputs and crop husbandry practices vary across the regions, resulting in considerable variations in yield. Under such diverse farming conditions, estimating the representative cost of production is quite problematic.

72. The cost of production of seed cotton for the 2001-02 crop, in the Punjab and Sindh, have been updated by adopting the input-output parameters as used in calculating the COP estimates for the 2000-01 crop in conjunction with the latest prices of various inputs and custom hire rates of cultural operations. These rates were obtained through mini field survey conducted by the APCom during January, 2001 in the major growing areas of the Punjab and Sindh. The input prices and custom hire rates were discussed in the meeting of the APCom's Standing Committee, held on 26th February, 2001 at Multan and supplemented with the information provided by the representatives of the Provincial Agricultural Departments and Farmers' Associations. The detailed COP estimates are provided in Annexes-V and VI, while a summary of the results is presented in Table-8.

Table-8: Average Farmers' Cost of Production of Seed Cotton: 2000-01 and 2001-02 Crops

Item	Unit	2000-01 crop	2001-02 crop	Increase in 2001-02 over 2000-01
Punjab				
1. Cost of cultivation	Rs/acre	11073	12305	1232
2. Yield	Kgs/acre	671	671	0
3. Cost of production at farm level	Rs/40 kgs	660	734	74
4. Marketing cost	"	10	14	4
5. Cost of production at market/ginnery	"	670	748	78
Sindh				
1. Cost of cultivation	Rs/acre	9188	10025	837
2. Yield	Kgs/acre	602	602	0
3. Cost of production at farm level	Rs/40 kgs	610	666	56
4. Marketing cost	"	10	14	4
5. Cost of production at market/ginnery	"	620	680	60

Note: The figures have been rounded off.
Source: Annex-V and VI.

Punjab

73. As per details given in Annex-V and summary in Table-8, growing one acre of seed cotton in the Punjab during 2001-02 is likely to cost Rs 12,305, including land rent. Based on the average yield of 671 kgs per acre, ex-farm COP would work out to Rs 734 per 40 kgs. Accounting for marketing cost @ Rs 14 per 40 kgs, the cost of the produce at the market/ginnery level should come to Rs 748 per 40 kgs, reflecting an increase of Rs 78 or 12 per cent over the corresponding cost of Rs 670 in 2000-01 crop.

74. Land rent accounts for 24 per cent of the overall cost of cultivation of seed cotton. Other important constituents are: plant protection (19 per cent), irrigation (11 per cent), chemical fertilizers (11 per cent), picking charges (10 per cent), cultural operations (8 per cent), interculture (5 per cent) and seed and sowing operations (5 per cent).

Sindh

75. The data in Table-8 indicate that the cost of cultivation of seed cotton, during 2001-02 crop year, in Sindh is expected at Rs 10,025 per acre, inclusive of land rent. Distributing this cost over the average yield of 602 kgs, the farm level cost of production would be Rs 666 per 40 kgs. Adding the marketing cost @ Rs 14 per 40 kgs, the market/ginnery level cost of the produce i.e., seed cotton would come to Rs 680 per 40 kgs, showing an increase of Rs 60 or 10 per cent over the previous year's cost estimated at Rs 620.

76. The principal components in the cost of cultivation of seed cotton in Sindh are: plant protection (17 per cent), land rent (17 per cent), chemical fertilizers (14 per cent), picking charges (12 per cent), land preparation (10 per cent), interculture (9 per cent), seed and sowing operations (8 per cent) and irrigation (5 per cent).

77. The major sources of increase in cost of production of seed cotton for the 2001-02 crop in the Punjab and Sindh are higher rates of cultural operations, tube-well irrigation, transportation, escalation in the prices of seed, fertilizers, plant protection, material, picking charges. The rise in land rentals has also added to the increase in cost of production.

8.3 Comparative Economics of Cotton and Competing Crops

78. Resource allocation by farmers among competing crops is, inter alia, governed by economic considerations like gross cost, cash expenses, gross margin, net income, output-input ratio and returns to purchased inputs, etc. Estimation of such indicators may provide useful insights to policy makers about the allocative behaviour of growers and help in formulating future course of action in line with the changing requirements..

79. The use of multiple indicators, however, may provide conflicting signals. These economic indicators are derived from the farm management data and input-output prices which are subject to change over time and space. These limitations of data and analysis need to be kept in view while interpreting the results of comparative analysis.

80. Cotton, a kharif crop, competes with rice for land, water and other resources in the areas where cultivation of both these crops is technically feasible. Cotton also competes with sugarcane which occupies land round the year. However, the combination of cotton and rabi crops would have to be considered in comparing their economic position against sugarcane. The relevant combinations would be cotton+wheat and cotton+sunflower.

81. In the wake of increasing liberalization, bulk of produce in most of the farm commodities is being transacted at market prices. Therefore, comparative economics of cotton and competing crops has been analysed in terms of prices realized by the growers.

82. The details about the comparative economics of cotton and competing crops in terms of prices applicable for 2000-01 crop year are set out in Annex-VII while a summary of the important indicators is provided in Table-9.

Punjab

83. From the data summarized in Table-9 cotton farming in the Punjab seems to enjoy a distinct edge over rice crops in terms of returns to overall investment, revenue per unit, each, of crop duration, irrigation and purchased inputs.

84. In case of indirect competition with sugarcane, cotton combinations with wheat or sunflower performed better than sugarcane in respect of revenue per day of crop duration and per acre-inch of irrigation water. However, sugarcane outranked cotton and its combinations in terms of output-input ratio and returns to purchased inputs.

Table-9: Comparative Economics of Cotton and Competing Crops at Prices Realized by the Growers in 2000-01 Crop Year

Crops/crop combinations	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of Crop duration	acre-inch of water used
		----- Rupees -------		
Punjab				
1. Cotton	1.34	3.18	63.26	690.10
2. Basmati paddy	0.80	1.46	37.22	115.52
3. IRRI paddy	0.81	1.46	32.49	94.32
4. Cotton+Wheat	1.18	2.78	55.33	595.88
5. Cotton+Sunflower	1.25	3.29	59.50	519.25
6. Sugarcane	1.55	4.68	53.30	477.30
Sindh				
1. Cotton	1.42	3.41	55.79	743.85
2. IRRI paddy	0.93	2.01	32.82	105.49
3. Cotton+Wheat	1.25	3.05	49.48	629.73
4. Cotton+Sunflower	1.29	3.46	54.83	526.36
5. Sugarcane	1.79	4.69	55.17	464.22

Source: Annex- VII.

Sindh

85. It may be seen from Table-9 that cotton cultivation , in Sindh like that in the Punjab, has a definite edge over IRRI paddy in terms of output-input ratio and revenue per unit, each, of crop duration, purchased inputs cost and irrigation water.

86. In case of indirect competition, cotton combinations out-competed sugarcane in respect of revenue per unit of irrigation. However, sugarcane performed better in terms of returns to overall investment and revenue per rupee of purchased inputs and per day of crop duration.

8.4 Economics of Fertilizer Use

87. The judicious use of fertilizers plays a critical role in increasing farm production and raising productivity. However, the use level itself depends on its economics which depends on the crop's response, use of complementary inputs and input - output prices. The present section examines economics of N and P fertilizers use on cotton through estimating (a) Benefit Cost Ratios (BCRs) at various crop-fertilizer responses and (b) parity ratios between prices of fertilizers and seed cotton. The results are discussed below:

8.4.1 Benefit-Cost Ratios (BCRs)

88. BCR is the ratio between gross value of additional produce and the gross costs of additional fertilizer. A BCR of 1.00 indicates no profit no loss situation or the break even point. BCR of less than 1 means a loss, that is money spent on fertilizer is more than what can be earned by selling the extra produce including by products. BCR of more than 1 implies that returns from additional produce and its by-products are higher than the additional cost spent on fertilizers. The experts recommend a BCR of 2 or more under low risk (irrigated) conditions for sustainable use of fertilizers. To capture the variation in crop fertilizer response and effect of overtime fluctuations in the input-output prices the benefit - cost analysis of fertilizer use on cotton has been attempted at different response ratios for the last 10 years. The details of BCR calculations are given in Annex-VIII while a summary of the results is presented in Table-10.

Table-10: Benefit Cost Ratios (BCRs) of Fertilizer use on Seed Cotton: 1991-92 to 2000-01

Year	Response Ratios (seed Cotton: Nutrient) of			
	3.00:1	**3.75:1**	**4.50:1**	**5.25:1**
1991-92	2.39	2.86	3.29	3.68
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

Note: BCRs on country basis have been worked out at the average market prices of American cotton varieties for the respective years. The average of monthly seed cotton prices for the post harvest period (September to January) in the important markets of the Punjab and Sindh for the respective years have been used. The average expenses on direct and indirect costs have been worked out by using the unit cost of various parameters used in COP estimates of the Punjab and Sindh for the respective crop years as given in the respective support price policy reports on seed cotton.

89. Data presented in Table-10 suggest that the BCRs of fertilizer use on cotton crop during the period under reference reflect a wide range. This wide variation is mainly attributable to increasing prices of fertilizers, and fluctuations in the open market prices of seed cotton. The market prices of seed cotton ruled very high during 1994-95 crop season resulting in the highest BCRs at various response ratios i.e. 4.34, 5.15, 5.88 and 6.55 at response ratios of 3.00:1, 3.75:1, 4.50:1 and 5.25:1, respectively. During 1992-93, 1995-96 and 1996-97 economics of fertilizer use in cotton farming, as reflected in BCRs ranging from 3.05 to 5.13 at various response ratio, was quite attractive. In the wake of bumper domestic crop and low international prices of cotton, prices of seed cotton in 1999-2000 plummeted to unprecedented low levels. The market prices in certain cases did not even cover the cost of production of the farmers, adversely affecting the economics of cotton farming. The lowest BCRs ranging from 1.66 to 2.51 were estimated during this crop year. However, attractive prices received by the growers during the 2000-01 crop year have improved the economics of fertilizer use in favour of the crop as BCRs during this year have ranged from 2.51 to 3.71 at various response ratios.

8.4.2 Parity ratios between prices of fertilizer and seed cotton

90. The fertilizer -crop price parity ratio refers to units of the produce required to pay for one unit of fertilizer. Rise in this ratio implies that larger quantity of the produce is required to buy a given quantity of fertilizer and vice a versa. In cotton farming mostly nitrogenous and phosphatic fertilizers are used. Therefore, parity ratios have been estimated for these fertilizers for the period 1991-92 to 2000-01 in Table-11.

Table-11: Parity Ratio Between the Prices of Fertilizers and Seed Cotton: 1991-92 to 2000-01

Crop Year	Sale price of		Market price of seed cotton	Quantity of seed cotton (phutti) needed to buy one nutrient tonne of	
	Nitrogen (N)	Phospharous (P_2O_5)		Nitrogen (N)	Phosphorous (P_2O_5)
	------Rupees per tonne-------			-------Tonnes-------	
1991-92	8261	7637	8250	1.00	0.93
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

Notes:

1. The nutrient prices of nitrogen (N) and phosphorous (P_2O_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 (September to January) in important markets of the Punjab and Sindh as given in the respective Support Price Policy Reports.

91. The data in Table-11 suggest that parity ratio between prices of N and that of seed cotton was the highest, i.e. 1.00, in 1991-92 which gradually fell to 0.50 in 1994-95, implying that purchasing power of the seed cotton improved by 50 per cent during this period. The parity ratio, has since been on the rise, reaching 0.98 in 1999-2000, indicating substantial erosion in

the purchasing power of seed cotton due to disproportionate changes in the input-output prices. However, during 2000-01 purchasing power of cotton in terms of nitrogen has improved due to higher prices of seed cotton and lower prices of fertilizers as compared to the previous year.

92. The parity ratio between prices of P-fertilizer and of seed cotton (Table-11) declined from 0.93 in 1991-92 to 0.55 in 1994-95 showing an improvement of 40 per cent in the purchasing power of seed cotton viz-a-viz phosphorus. However, in the following years parity ratio moved against cotton. In this context 1999-2000 was the most unfavourable as market prices of cotton fell to unprecedented low levels. The situation however improved dramatically during the current year as prices of cotton rose by over 40 per cent and those of $P_2 O_5$ fell as compared to the last year. Accordingly, 40 per cent less of cotton was required to buy the same amount of $P_2 O_5$ fertilizers in 2000-01 season in relation to the last year.

8.5 Nominal and Real Prices of Seed Cotton (Phutti)

93. It is the policy of the government to annually review the support price of seed cotton (phutti) which is an important cash crop and major source of foreign exchange earnings. In the wake of de-regulation and increasing role of private sector, the market prices of seed cotton have, however, assumed greater role in the transactions. The changes in the prices in relation to the general inflation in the economy influence the purchasing power of the commodity and real income of the growers. To ascertain changes in the real value of seed cotton for the period of 1990-91 to 2000-01, its nominal support and market prices were deflated by the corresponding Consumer Price Index (CPI), the most commonly used measure of inflation in the economy. The results of the exercise are set out in Table-12 and presented in Figures 3 and 4.

8.5.1 Nominal and real support prices

94. The nominal and real support prices of seed cotton from 1990-91 to 2000-01 are set out in Table-12 and depicted in Figure-3.

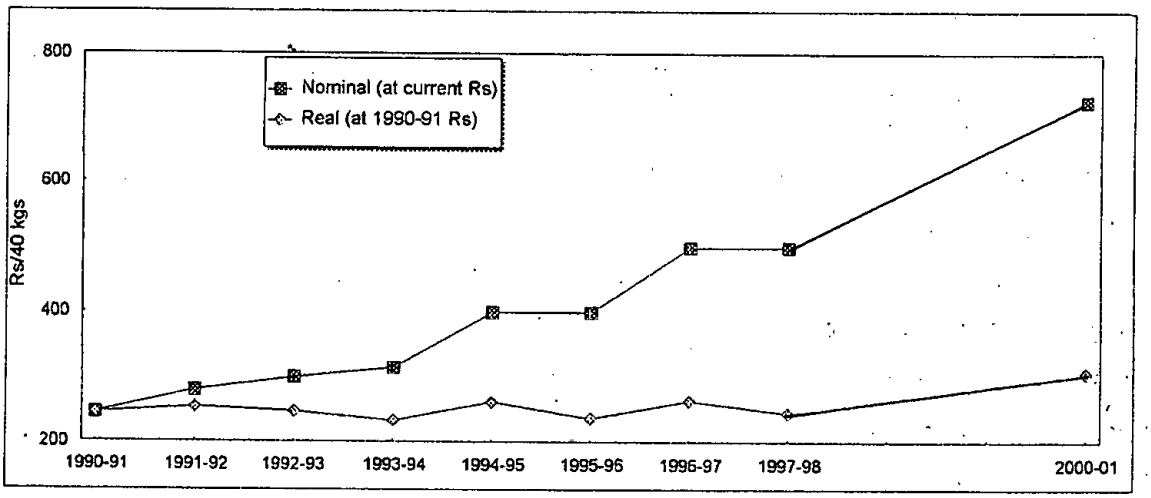

Fig-3: Nominal and Real Support Prices of Seed Cotton: 1990-91 to 2000-01
Note: The Support Price of Seed Cotton (Phutti) for 1998-99 and 1999-00 was not fixed by the government.

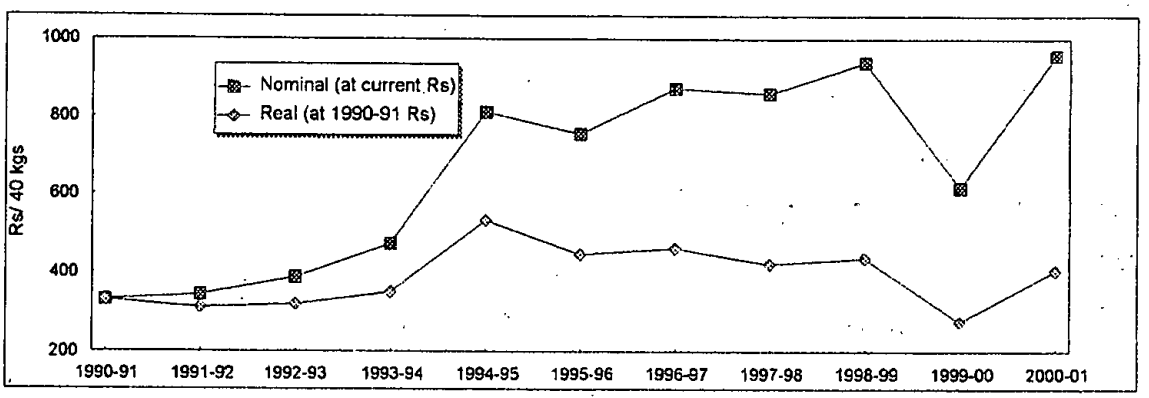

Fig-4: Nominal and Real Market Prices of Seed Cotton: 1990-91 to 2000-01

Table-12: Nominal and Real Support and Market Prices of Seed Cotton (Phutti): 1990-91 to 2000-01

Crop year	Nominal Prices		Consumer Price Index (CPI)	Real Prices	
	Support	Market		Support	Market
1	2	3	4	5=(2/4)x100	6=(3/4)x100
	Rs per 40 kgs		1990-91=100	Rs 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	-	938	215.66	-	434.94
1999-00	-	614	223.39	-	274.86
2000-01	725	957	236.15	307.01	405.25

Sources:

1. Economic Survey of Pakistan, 1999-00: Statistical Supplement.
2. Directorate of Economics and Marketing (E&M) Punjab, Lahore.
3. PCCC, Karachi.

Notes:

1. CPI for 2000-01 has been projected in view of the average rise in CPI during 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. Market prices are the average of monthly wholesale prices of seed cotton (phutti) during October to January in Multan market.
4. The support price for 1998-99 and 1999-00 crop years were not fixed by the Government.

95. Table-12 reveals that the nominal support price of seed cotton has increased from Rs 245 per 40 kgs in 1990-91 to Rs 725 per 40 kgs in 2000-01, an overall increase of 196 per cent. During the same period, the cumulative inflation in terms of CPI, has been 136 per cent. Consequently, the real value of the support price of seed cotton (phutti) for 2000-01 crop,

estimated at Rs 307 per 40 kgs in terms of 1990-91 prices shows an increase of 25 per cent in relation to the corresponding price of Rs 245 for 1990-91 crop.

96. During 1990-91 to 1994-95 the support price of seed cotton increased by 63 per cent while CPI rose by 53 per cent. As a result, the real value of the support price of seed cotton increased by 7 per cent. In 1995-96 the support price of seed cotton was not revised while CPI increased by about 11 per cent, resulting in 10 per cent lower value of real support price. In the wake of 25 per cent increase in the nominal value of support price of seed cotton in 1996-97 its real value jumped by 12 per cent. Again, in 1997-98, the support price of seed cotton was not increased which lowered the real value of seed cotton crop by about 7 per cent as compared to that of 1996-97.

97. Support price of seed cotton for 1998-99 and 1999-00 was not fixed by the government and for 2000-01 fixed at Rs 725 per 40 kgs. The real value of support price of seed cotton (phutti) for 2000-01 works out to Rs 307 per 40 kgs in terms of 1990-91 prices, the highest level observed during the period under review.

8.5.2 Nominal and real market prices

98. The nominal and real market prices of seed cotton from 1990-91 to 2000-01 are set out in Table-12 and depicted in Figure-4.

99. The market prices of seed cotton (phutti) averaging at Rs 330 per 40 kgs in the Multan market during the harvest season of 1990-91 crop have since risen to Rs 957 per 40 kgs in 2000-01, showing an overall increase of 190 per cent. During the same period, the cumulative inflation in terms of CPI (1990-91=100) has been estimated around 136 per cent. Consequently, the real value of market prices of seed cotton (phutti) for 2000-01 crop estimated at Rs 405.25 per 40 kgs in terms of 1990-91 prices, reflects an overall rise of 23 per cent in relation to the corresponding price in 1990-91 crop year.

100. It has been noted that market prices of seed cotton (phutti) ruled higher than the support price fixed by the government through out the period under report. During 1990-91 to 1994-95 the nominal market prices of seed cotton increased by 145 per cent while CPI rose by 53 per cent. As a result, the real value of market prices of seed cotton jumped by 61 per cent to reach Rs 530.35 per 40 kgs in terms of 1990-91 prices, the highest level observed during the period under review. The real value of market prices of seed cotton in subsequent years hovered between Rs 420 to 460 per 40 kgs. and declined to Rs 274.86 per 40 kgs in 1999-00, the lowest level during the period under discussion. However, in the wake of recovery in prices of seed cotton in 2000-01, the real value of market prices rose to 405 per 40 kgs, a remarkable rise of 47 per cent over that of previous year.

8.6 Domestic Parity Prices of Seed Cotton

101. 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 point for working back the price of its raw material (i.e. cotton and seed cotton). The prices of cotton yarn (20's) ruling in Faisalabad market during the months of September, 2000 through January, 2001 have been used to work back the price of seed cotton. During these months, prices of yarn at Faisalabad averaged at Rs 466 per bundle of 4.54 kgs. Accounting for various costs involved in processing cotton into yarn, viz, conversion cost of lint into yarn, sales tax, transportation and storage costs, ginning charges and recoveries from the sale of cotton waste and cotton seed, price of seed cotton works back to 848 per 40 kgs. Detail may be seen in Annex-IX.

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

8.7.1 World supply, demand, stocks and trade

102. The world balance sheet of cotton for the period 1999-00 through 2001-02 is given in Table-13:

Table -13: World Balance Sheet of Cotton: 1999-00 to 2001-02

Item	1999-00	2000-01	2001-02 (Forecast)
	----------Million tonnes----------		
1. Opening stocks	9.86	8.93	7.98
2. Production	18.82	18.93	19.98
3. Total supply (Items 1+2)	28.68	27.86	27.96
4. Likely Consumption	19.75	19.88	20.24
5. Closing stocks	8.93	7.98	7.74
6. Trade (Exports)	6.12	6.07	6.24

Source: ICAC, Washington, USA. Release Report March 1, 2001.

103. The world production of cotton during 2000-01 is reported at 18.93 million tonnes, 0.11 million tonnes higher than that in 1999-00. Adding the opening stocks of 8.93 million, total supply in 2000-01 works out to 27.86 million tonnes, 0.82 million tonnes less than that of previous year. For 2001-02, cotton production is projected at 19.98 million tonnes. Adding opening stocks of 7.98 million tonnes, total supply of cotton during 2001-02 should be 27.96 million tonnes, which is 0.10 million tonnes more as compared to the level in 2000-01.

104. The global consumption of cotton, which has been increasing, stood at 19.88 million tonnes in 2000-01. For 2001-02, consumption is projected at 20.24 million tonnes, showing a rise of 0.36 million tonnes as compared to the level of 2000-01.

105. End year stocks in 2000-01 estimated at 7.98 million tonnes were 0.95 million tonnes less than the opening stocks and are forecast to fall to 7.74 million tonnes by the close of 2001-02.

106. World trade (exports) in cotton which has been on the rise since 1998-99 was reported at 6.07 million tonnes in 2000-01. Exports in 2001-02 are forecast to climb to 6.24 million tonnes, which would be 2.8 per cent higher than those of last year.

8.7.2 International prices

107. The cif North Europe prices of Sindh/Punjab Afzal 1-1/32", Index-B cottons and Orleans Texas Middling 1-1/32" cotton for the period 1990-91 through 2000-01 are presented in Annex-X and graphically depicted in the Figure-5. The price of Afzal 1-1/32" averaging at 76.82 US cents per pound in 1990-91 declined to 53.99 cents in 1992-93. During the next three years following an increasing trend prices averaged at 80.95 cents per pound in 1995-96, the highest level observed during the period under review. The cotton prices plummeted to 47.46 cents per pound in 1999-00, the lowest level in the period under review. During 2000-01 (September to January) price of Afzal has averaged at 57.60 cents per pound.

108. The cif values of Index-B cottons and prices of Orlean Texas Middling 1-1/32" showed a similar pattern as explained above for Pakistani cotton. The prices averaging at 77.22 and 79.78 cents per pound, respectively in 1990-91 touched their highest levels, 80.48 and 90.11 cents per pound in 1995-96. However, prices which have since been on the decline averaged at 49.28 and 52.35 cents per pound respectively in 1999-00. During September to January 2000-01 prices of these cottons have recovered and averaged at 60.33 and 61.15 cents per pound respectively.

8.8 Export Parity Prices

109. Export parity prices of a commodity are helpful in estimating its competitiveness in the world markets. It can also be used in determining the bench-mark reference price for the produce. Pakistan a net exporter of cotton, exported 575 thousand bales during 1999-00 (Sep - Aug). Export parity prices of seed cotton have been worked on the following bases:

a) Actual average export prices of Pakistani cotton:
b) Average cif North Europe Value of Index-B cottons:
c) Average cif North Europe quotations of Pakistani Afzal 1-1/32":
d) Futures contract price of New York No. 2 cotton
e) Average fob price of Pakistani cotton yarn (20's):

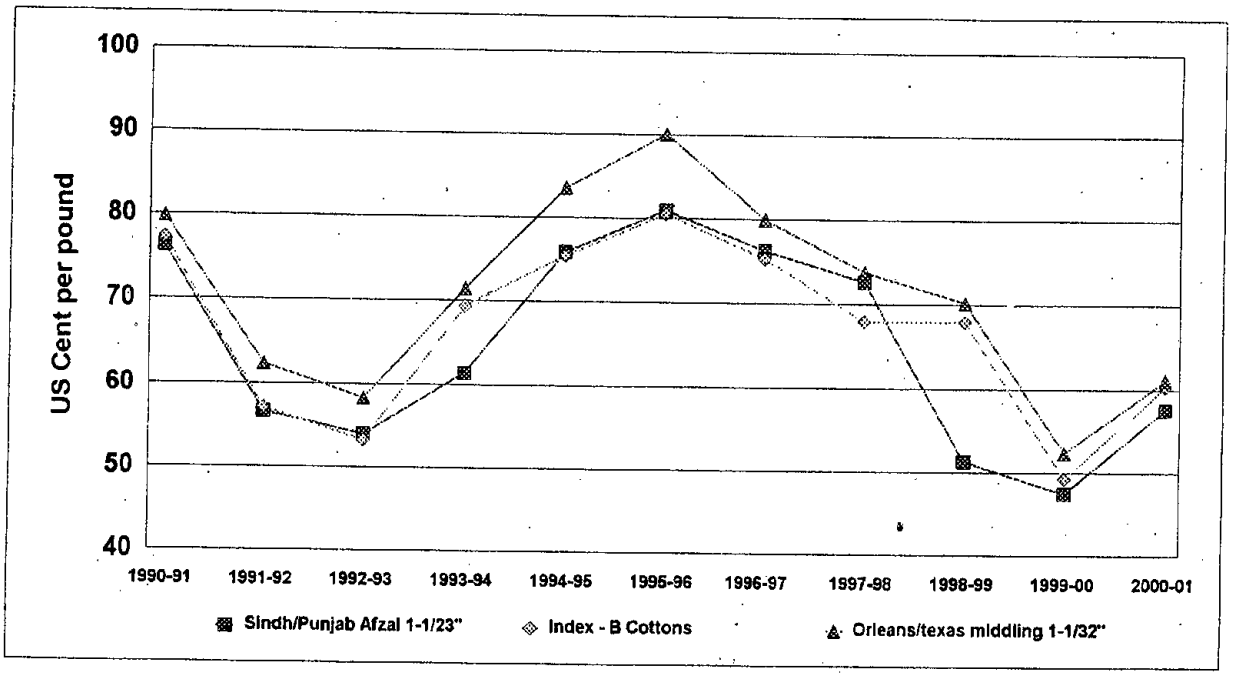

Fig- 5: CIF NORTH EUROPE PRICES OF VARIOUS COTTONS: 1990-91 TO 2000-2001

110. The details of the calculations based on above mentioned criteria are given in Annexes XI to XVI and their explanations are given below:

8.8.1 Based on actual average export prices of Pakistani cotton:

8.8.1.1 During 2000-01 (September - January)

111. Actual average fob export prices at Karachi of Pakistani cotton during 2000-01 (Sep–Jan) have averaged at US cents 45 per pound. Using the current exchange rate applicable to exports i.e. of one US $ = Rs 59.20 as on 26 February, 2001, it calculates to Rs 2,349 per 40 kgs. Accounting for the incidentals from ginnery up to export point, i.e. marketing expenses (export and purchase incidentals, insurance and financial expenses) @ Rs 175 per 40 kgs, the ex-gin price of lint cotton works back to Rs 2,174 per 40 kgs. Adding recovery of Rs 608 from the sale of 80 kgs of cotton seed and subtracting ginning charges of Rs 250, the economic price of seed cotton works back to Rs 2,532 per 120 kg or Rs 844 per 40 kgs. Details may be seen in Annex-XI.

8.8.1.2 During 1996-97 to 2000-01

112. During the period of 1996-97 to 2000-01 the actual export prices of Pakistani cotton averaged at US cents 55 per pound, equivalent to Pak Rs. 2,871 per 40 kg at the current exchange rate of Rs 59.20. Following the above mentioned procedure, the economic prices of seed cotton works back to Rs 1,018 per 40 kgs. (Annex - XI).

8.8.2 Based on average cif North Europe value of Index-B cottons:

8.8.2.1 During 2000-01 (September- January)

113. The cif North Europe value of Index-B* cottons during 2000-01 (September-January) has averaged at US cents 60 per pound. Deducting the freight charges from Karachi to North Europe (5 cents), insurance cost, agents commission and port handling charges @ 4 per cent of export price,

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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.

the net export price of lint at Karachi comes to US cents 53 or Rs 2,761 per 40 kgs at current exchange rate of one $ = Rs 59.20. Accounting for the expenses up to export point such as export and purchase incidentals, insurance and financial expenses, the ex-gin price of lint would come to Rs. 2,586 per 40 kgs. Adding recovery of Rs. 608 from the sale of 80 kgs of cotton seed and subtracting ginning charges of Rs. 250, the economic price of seed cotton works back to Rs 2,944 per 120 kgs or Rs 981 per 40 kgs. Details may be seen in Annex-XII.

8.3.2.2 During 1996-97 to 2000-01

114. The price of Index-B cottons during the period of 1996-97 to 2000-01 (September-January) averaged at US cents 64 per pound. Adopting the above mentioned procedure in working back the price of seed cotton from the export price of lint, the ex-gin economic price of seed cotton comes to Rs 1,045 per 40 kgs. (Annex-XII).

8.8.3 Based on average cif North Europe quotations of Pakistani Afzal 1-1/32"

8.8.3.1 During 2000-01 (September- January)

115. The cif North Europe quotations for Pakistani Afzal 1-1/32" cotton during the period of 2000-01 (September-January) have averaged at US cents 58 per pound*. Deducting the freight charges from Karachi to North Europe (5 cents), insurance cost, agents commission and port handling charges @ 4% of export price, the net export price of lint at Karachi comes to US cents 50 or Rs 2,624 per 40 kgs at the current exchange rate of one US $ = Rs 59.20. Accounting for the expenses up to export point such as export and purchase incidentals, insurance and financial expenses, the ex-gin price of lint would come to Rs. 2,649 per 40 kgs. Adding recovery of Rs. 608 from the sale of 80 kgs of cotton seed and subtracting ginning charges of Rs. 250, per 120 kgs of

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* This average price of is 13 cents higher than the actual average export price of Pakistani cotton. This difference may be due to the following reasons; (i) The latter is the average price of all varieties exported from Pakistan whereas the former is meant for Sindh/Punjab Afzal 1-1/32" only. (ii) It is a normal practice of export business that quotations given by the exporters are kept higher than the actual deal. (iii) Exporters keep cushion for under invoicing.

seed cotton, the ex-gin economic price of seed cotton works back to Rs 936 per 40 kgs. Details may be seen in Annex-XII.

8.8.3.2 During 1996-97 to 2000-01

116. The cif North Europe quotations for Pakistani Afzal 1-1/32" cotton during the period of 1996-97 to 2000-01 (September-January) have averaged at US cents 61 per pound. Adopting the above mentioned procedure in working back the price of seed cotton from the price of lint, the ex-gin economic price of seed cotton comes to Rs 992 per 40 kgs (Annex-XII).

8.8.4 Based on futures contract price of New York No.2 cotton

117. The futures contract prices of New York No.2 cottons for the deliveries in October, 2001, December 2001 and March 2002, average at US cents 61 per pound as quoted in Cotton Outlook of February 02, 2001. Discounting for the grade and staple differential (US cents 4), and accounting for inland transportation charges (US cents 6.0), the parity price for Pakistani cotton Afzal 1-1/32" calculates to cents 52 per pound or Rs 2,692 per 40 kgs. Accounting for the export incidentals, value of cotton seed and ginning charges, the economic price of seed cotton works back to 958 per 40 kgs (Annex-XIII).

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

8.8.5.1 During 2000-01 (September-January)

118. The fob price of Pakistani cotton yarn (20's) during 2000-01 (Sep-Jan) has averaged at US cents 188 per kg or Rs 112 per kg. Accounting for the fob expenses, cost of export packing (@ Rs 1 per kg), recovery from 0.16 kgs of cotton waste (@ Rs 1.34 per kg), conversion charges of lint into yarn (@ Rs. 30 per kg), transport cost from ginnery to mill (@ Rs 30 per 40 kgs) value of cotton seed @ Rs 608 and ginning charges (@ Rs 250 per 40 kgs), the economic price of seed cotton at ginnery level works back to Rs 999 per 40 kgs. Details may be seen in Annex–XIV.

8.8.5.2 During 1996-97 to 2000-01

119. The fob price of Pakistani cotton yarn (20's) during 1996-97 to 2000-01 averaged at US cents 217 per kg or Rs 129 per kg. Adopting the procedure mentioned earlier the economic price of seed cotton at ginnery level works back to Rs 1,194 per 40 kgs. Details may be seen in Annex-XIV.

8.9 Import Parity Prices

120. Pakistan is a net exporter of cotton. However, during 1999-00 crop year (Sept – Aug) 496 thousand bales of raw cotton were imported into Pakistan. Thus, import parity prices have been worked out on the basis of average cif North Europe price of Orleans/Texas Middling 1-1/32 and actual average cif (Karachi) price of imported cotton.

8.9.1 On the basis of Average cif North Europe Quotations of Orleans/Texas Middling 1-1/32 2000-01 (Sep to Jan)

121. The average cif North Europe of quotations of Orlean/Taxas Middling 1-1/32" during 2000-01 (Sep-Jan) averaged at US Cents 61 per pound. Adding freight charges (@ US cents 5 per lb) and forwarding charges (@ US cents is 1 per pound), insurance charges, agents commission and port handling charges (@ 3 US cents per pound), the landed cost at Karachi comes to US cents 70 per pound or Rs. 3,651 per 40 kgs. Adding handling charges at port, and transport cost from port to textile mill at Karachi @ 3 per cent of cif price (Rs. 87), the ex-gin price of lint cotton calculates to Rs 3,742. After adjusting for the value of 80 kgs cotton-seeds i.e. Rs 608 and subtracting the ginning charges @ Rs. 250, the economic price of seed cotton works out to Rs 1,367 per 40 ks. Details may be seen in Annex-XV.

8.9.2 On the basis of actual Average cif (Karachi) price of imported cotton during 2000 (Jan to Dec)

122. Actual Average cif (Karachi) price of imported cotton during 2000 (Jan to Dec) averaged at Rs 3,195 per 40 kgs. Accounting for the incidental charges from Karachi port to ginneries, the

ex-gin price of cotton lint calculates to Rs 3,275 per 40 kgs. Further, adjusting for the value of cotton-seed and ginning charges, the economic price of seed cotton works out to Rs 1,211 per 40 kgs. Details may be seen in Annex-XVI.

9. THE SUPPORT PRICE

123. Cotton is annually cultivated on about 3 million hectares. Its production has experienced wide fluctuations during the last decade owing to a number of factors. Since cotton has large share in exports and value added by the agriculture sector, its fluctuating production adversely affects foreign exchange earnings and the growth rate in the economy. Therefore, it is imperative to stabilize its production keeping in view the domestic requirements and developments in export markets. Assuring conducive economic environment for the adoption of improved production technology by the farmers can play an important role in this regard.

124. Cotton production during 2000-01 in the country is estimated at 10.5 million bales which is 6 per cent short of the production from the crop reported at 11.2 million bales in 1999-00. Domestic consumption both mill and non-mill is around 10.8 million bales. Adjusting for exports and imports upto February and stocks at the beginning of the year, the end-year stocks should be around 2.4 million bales.

125. Global production of cotton for 2000-01 is reported at 18.93 million tonnes. Adding opening stocks of 8.93 million tonnes total supply of cotton in 2000-01 works out 27.86 million tonnes. Global consumption is estimated at 19.88 million tonnes, thus leaving the end-year stocks at 7.98 million tonnes. Stocks consumption ratio works out 0.40, which is forecast to reduce to 0.38 during 2001-02. Thus, world prices of cotton during 2001-02 are expected to remain favourable to the growers.

126. Based on the analysis of various domestic and international factors, the worked back prices of seed cotton along with market prices and cost of production are summarized below:

	Criterion	Likely price of seed cotton at ginnery
		Rs per 40 kgs
A.	Parity price of seed cotton based on the domestic price of yarn at Faisalabad (Annex-IX)	848
B.	Export parity prices based on prices of cotton lint:	
i)	Actual average export price of Pakistani cotton (Annex-XI)	
	- during 2000-01 (Sept-Jan)	844
	- during 1996-97 to 2000-01	1018
ii)	CIF (North Europe) quotation of Index-B cottons (Annex-XII)	
	- during 2000-01 (Sept-Jan)	981
	- during 1996-97 to 2000-01	1045
iii)	Afzal 1-1/32" (Annex-XII)	
	- during 2000-01 (Sept-Jan)	936
	- during 1996-97 to 2000-01	992
iv)	Futures contract price of New York No.2 cotton (average of October 2001, December 2001 and March, 2002 deliveries (Annex-XIII)	958
v)	Average fob price of Pakistani cotton yarn (20's) (Annex-XIV)	
	- during 2000-01 (Sept-Jan)	999
	- during 1996-97 to 2000-01	1194
C.	Average domestic market price of seed cotton in 2000-01 (Sept to Jan)	899
D.	Import parity prices based on:	
i)	Actual average cif price during 2000 (Jan to Dec) (Annex-XV)	1211
ii)	Cif North Europe price of Orleans/Texas Middling 1-1/32 during 2000-01 (Sept to Jan) (Annex-XVI)	1367
E.	Cost of Production for 2001-02 crop	
	Punjab (Annex-V)	748
	Sindh (Annex-VI)	680

127. The parity price of seed cotton worked back from the average domestic price of yarn (20's) prevailing in Faisalabad market during harvest season (September 2000 to January, 2001) comes to Rs 848 per 40 kgs against the harvest season average price of Rs 899 for the main markets.

128. The export parity price of seed cotton worked back from the actual average export price of Pakistani cotton come to Rs 844 per 40 kgs and 1,018, respectively calculated for the prices received in 2000-01 and during 1996-97 to 2000-01.

129. Export parity prices of seed cotton when calculated from the cif North Europe values of Index-B and Sindh/Punjab Afzal 1-1/32 cotton during 1999-00 work back to Rs 981 and 936 per 40 kgs. However, when based on the corresponding averages for 1996-97 to 2000-01 these calculate to Rs 1,045 and 992 per 40 kgs respectively.

130. The export parity price of seed cotton worked back from futures contract prices of New York No. 2 cottons as on February 2, 2001 after adjusting for quality differential, calculates to Rs 958 per 40 kgs. The export parity price as worked back for the yarn works out to Rs 899 and Rs 1,094 per 40 kgs respectively for 2000-01 (Sep – Jan) and 1996-97 to 2000-01 periods.

131. The import parity prices of seed cotton at ginnery level, based on cif North Europe quotations of Orleans/Texas/Middling 1-1/32" during September to January, 2000-01 and actual average cif price of imported cotton during July to December, 2000 come to Rs 1,367 and Rs 1,211 per 40 kgs respectively.

132. The wholesale prices of seed cotton during post harvest period (Sept-Jan) of 2000-01 have ranged between Rs 696 and Rs 1,061 per 40 kgs in main producer area markets of Punjab. In Sindh these prices ranged between Rs 780 to Rs 949 per 40 kgs. In the beginning of season prices were relatively low, however during the peak of season, these rose much higher than the support prices.

133. The average nominal market price of seed cotton in the Multan market has increased overtime from Rs 330 per 40 kgs in 1990-91 to Rs 614 per 40 kgs in 1999-00. The real value of market prices received by the growers, however, declined from Rs 330 per 40 kgs in 1990-91 to Rs 275 in 1999-00 reflecting an overall decrease of 17 per cent. In 2000-01, real value of market prices was estimated at Rs 405 per 40 kgs up by 47 per cent.

134. Estimated cost of production (COP) of seed cotton at ginnery level for the 2001-02 crop, comes to Rs 748 per 40 kgs in Punjab and Rs 680 per 40 kgs in Sindh. These costs have shown an increase of 12 and 10 per cent respectively over their corresponding cost estimates of the previous year.

135. The results of all parameters impacting on domestic and international prices of Pakistani cotton warrant that producer price of seed cotton for 2001-02 crop should be increased. Cost of production has increased by 10-12 per cent during 2001-02. Giving 7.5 per cent increase in the support price for 2000-01, the same for 2001-02 calculates to Rs 780 per 40 kgs. This price still would give 4 per cushion to Punjab growers and 15 per cent to Sindh cotton growers over the cost of production. This cushion is justifiable in view of much higher export parity prices and expected change in world stock consumption ratio for 2001-02. World stock consumption ratio indicates that world prices during the coming season may remain firm and base support price of Rs 780 will not pose serious problem for the implementing agency. The increase in the COP particularly in the Punjab, though is not fully compensated by the increase in the price, yet it is expected that increase in the cotton yield will fill this gap.

136. This base price would be applicable to base grade 3 with staple length of 1-1/32" and micronaire between 3.8 and 4.9 NCL. Premia and discounts for higher/lower staple lengths and grades and discounts for micronaire falling outside the above mentioned acceptable limits will also be applicable as are discussed in the following section 10.

10. PAYMENT ACCORDING TO QUALITY AND STAPLE LENGTH

137. Historically, seed cotton support prices in the country have been fixed on the basis of variety although its marketing is seldom carried out by variety as price is influenced by its grade, staple length, micronaire, etc. This issue has been under consideration and was debated at length at different fora. In the meeting of APCom's Standing Committee on cotton held on 25-2-1997 at Multan, an expert committee was constituted. The Committee deliberated all the aspects and pointed out that basic limitation in recommending and announcing the support price of seed cotton on grade, staple length and micronaire basis was the lack of parallel and corresponding system for lint as KCA was also announcing spot prices of lint by variety. Thus, before switching over for seed cotton, it was necessary to amend the system for lint prices. KCA had already

moved an amendment in 1996 to this effect to the Ministry of Commerce. The amendment was approved by the government in May, 2000 and since 1st July 2001, KCA has started announcing the spot prices of lint on the basis of grade, staple length and micronaire. Now spot prices of lint for "Base Grade" with staple length of 1-1/32" and micronaire values ranging between 3.8 – 4.9 NCL (no control limit) for grades Super, 1, 2 and 3; and micronaire values between 3.5 – 4.9 NCL for grades 4 and 5 are announced. In addition premia/discounts for higher/lower staple lengths and discounts for micronaire values falling outside the above limits are announced.

138. Based on the formula, provided by PCSI for calculating premia and discounts for various grades, and premia and discounts applied by KCA for lint for staple lengths and micronaire, APCom has worked out premia/discounts for various grades, staple lengths of seed cotton with acceptable values of micronaire and are given in Table-14.

Table-14 : Grade and Staple Margins for Seed Cotton

(Per cent of base grade price)

Grade	Staple length					
	31/32"	1"	1-1/32"	1-1/16"	1-3/32"	1-1/8"
Super	N.Q	+3.2	+5.4	+7.6	+9.8	+12.0
One	N.Q	+1.4	+3.6	+5.8	+8.0	+10.2
Two	N.Q	-0.2	+2.0	+4.2	+6.4	+8.6
Three	N.Q	-2.2	Base	+2.2	+4.4	+6.6
Four	-6.7	-4.5	-2.3	-0.1	+2.1	+4.3
Five	-9.0	-6.8	-4.6	-2.4	-0.2	+2.0

139. The discounts for various grades of seed cotton having micronaire values outside the acceptable range are given in Table-15.

Table-15: 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.

140. The formula for calculating premia/discounts applicable for seed, cotton as provided by PCSI, are given in Annex-XVII.

11. MEASURES FOR IMPROVING PRODUCTIVITY, QUALITY AND MARKETING

11.1 Improving Productivity

141. Cotton farming has faced many problems in the past. The statistics have shown that major increase in total production of cotton has occurred mainly due to horizontal expansion i.e. increased acreage while its productivity has shown a negative growth rate during the decade ending 1999-00. Major thrust of policy ought to be on enhancing per hectare yield of cotton particularly through evolving high yielding, disease resistant varieties and realizing the potential of existing varieties by arranging improved seed in sufficient quantities, balanced use of plant nutrients, strengthening of pest scouting and adoption of other plant protection measures collectively named as Integrated Pest Management (IPM). These aspects were discussed in the support price policy for seed cotton of earlier years. However, the developments in this regard are inadequate. Hence these are discussed in brief in the following paragraphs alongwith the latest developments where available and measures required to be adopted for achieving the objectives in future.

11.1.1 Improved Seed

142. The role of improved seed in increasing crop production and productivity in general and open pollinated crops like cotton in particular is quite crucial as entire acreage is recommended to be sown with certified seed. The position with regard to seed requirements and supplies both from public and private sectors in the Punjab and Sindh, the two main cotton producing provinces, has been given in Annexes-XVIII and XIX.

Punjab

143. The data reveal that supply of certified seed of cotton in 1991-92 catered for only 28.6 per cent of the requirements. Of the total supply private sector contributed only 10 percent while the rest was contributed by PSC. In 1992-93 supplies rose to cover about 33 per cent of the cotton acreage and private sector contributed 20 per cent of the total supply. In 1993-94 seed supply from the public sector declined from 13 to 8 thousand tonnes. In the wake of declining cotton area certified seed supplies met about 25 per cent of the requirement. The situation improved much in 1994-95 and 1995-96 when area sown with improved seed rose to 40 and 50 per cent, respectively.

144. The continuous spread of CLCV disease since its first appearance in 1990 reduced the demand of old varieties and enhanced the demand for certified seed of new varieties resistant to this disease. But short supply of pre-basic and basic seed of new varieties hindered seed multiplication programmes of the public and private sector seed agencies. The supplies of seed, both from public and private sectors was only 8.62 thousand tonnes in 1996-97 barely sufficient to cover 17 per cent of the cotton acreage. In 1997-98 situation improved considerably as supply of certified seed rose to 20.62 thousand tonnes, meeting 44 per cent of the requirements. However, continuous spread of CLCV disease further increased demand for new varieties resistant to this disease and lowered the sale of old varieties as well as of varieties becoming susceptible or proving less resistant to CLCV disease. This situation affected the seed production programme in both private and public sectors. Because of this, supplies declined to 15.12 thousand tonnes in 1998-99 and 13.44 thousand tonnes in 1999-2000 which met only 33

and 29 per cent of the requirement respectively. In these years, public sector could hardly arrange one third of the total supply while the rest was provided by private sector.

145. In 2000-01 supplies of certified seed improved dramatically, covering about 70 per cent of the total cotton acreage. These supplies were mainly contributed by the private sector as public sector could offer only 10 per cent of the total requirements.

146. Punjab Seed Corporation is the only public sector seed agency in the province. It has developed its own infrastructure for the production,, multiplication and marketing of improved seed of almost all the crops including cotton. Variety wise supply of certified seed of cotton by PSC and private sector for 2000-01 crop alongwith the per cent of the total cotton area which could be sown with this seed is given in Table-16.

Table-16: Distribution of Cotton Seed in the Punjab by Variety: 2000-01 Crop

Variety	Public Sector	Private Sector	Total	Area Covered
	----------Tonnes----------			Per cent
N Karishma	795.0	3143.5	3938.5	8.1
CIM-443	414.0	2001.5	2415.5	5.0
CIM-446	1207.0	6511.1	7718.1	15.8
Niab-78	1431.0	7776.0	9207.0	18.9
109	246.0	2811.7	3057.7	6.3
Bh	161.0	1946.0	2107.0	4.3
CIM-44[illegible]	370.0	1764.0	2134.0	4.4
CIM-240	245.0	181.0	426.0	0.9
FHV-53	-	1380.3	1380.3	2.9
FH-634	-	-	-	-
MNH-447	-	-	-	-
MNH-93	-	28.0	28.0	-
CIM-1100	-	-	-	-
SLS-1	-	298.1	298.1	0.6
MNH-147	-	4.0	4.0	-
BH-118	-	-	-	-
FH-901	-	-	1.5	-
CIM-482	-	1.5	-	-
Total	4869.0	27846.7	32715.7	67.2

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

147. The variety wise distribution of cotton area estimated by Directorate of Pest Scouting and Crop Reporting Services is given in Annex-XX. It may be seen from these data that more than 20 per cent of the cotton area is sown with unapproved and outdated varieties. The area under unapproved and outdated varieties needs to be replaced with approved varieties using certified seed. The farmers need to be educated through extension services and mass media for sowing the varieties recommended for different areas. PSC should also increase the supply of seed of CLCV resistant varieties and undertake aggressive marketing to increase the sale of certified seed.

Sindh

148. Data regarding requirement and supply of certified seed in Sindh (Annex-XVIII) reveal that neither public nor private sector played any significant role in improving supply position during the period from 1990-91 to 1996-97. However, private sector showed some progress in 1997-98 by supplying about 8.75 thousand tonnes of cotton seed out of which 8.37 thousand tonnes were of relaxed standards. The public sector (SSC) could supply only 0.22 thousand tonnes of certified seed in that year. Total supply including that of relaxed standards sufficed for about 50 per cent of the requirement of that year. The supply position improved in 1998-99 due to increased supply of seed by the private sector. The public sector again did not play much role. The supply of certified seed by public sector in 1999-2000 declined to 60 tonnes as compared to 100 tonnes in previous year. The private sector sold 800 tonnes but of relaxed standard against the total requirement of over 19 thousand tonnes. The situation further deteriorated in 2000-01 when public sector could produce/supply only 2 tonnes of certified seed. However, 1093 tonnes of seed were distributed by the private sector which met about 7 per cent of the total requirements.

149. Variety wise availability of seed during 2000-01 is given in Table-17. It may be seen that the bulk of the supply i.e. 1069 tonnes were of Niab-78 variety and only 24 tonnes of CIM-446, CIM-443 and CRIS-9 (Table-17). No seed of other varieties like Chandi, Reshmi, Rehmani, Shaheen and K-68/9 was supplied. Thus, almost the entire crop in the province is sown with uncertified seed or with varieties not specifically developed for cultivation in the province.

150. The public and private sector seed distributing agencies be asked 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.

Table-17: Distribution of Cotton Seed in Sindh by Variety: 2000-01 Crop

Variety	Public Sector	Private Sector	Total	Area covered with certified seed
	----------Tonnes----------			Per cent
Niab-78	-	1069	1069	6.80
CIM-446	-	20.0	20.0	0.1
CIM-443	-	2.0	2.0	-
CRIS-9	2.0	-	2.0	-
Chandi	-	-	-	-
Reshim	-	-	-	-
CIM-109	-	-	-	-
Total	2.0	1091	1093	6.96

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

11.1.2 Integrated pest management

151. The chemical control of pests has arrested the yield losses to a great extent. However, indiscriminate use of pesticides has resulted in the development of resistance in pests against various chemicals, emergence of new species, destruction of natural enemies of various cotton pests, infestation of certain pests previously not considered a serious threat to cotton cultivation above economic injury level, environmental pollution and health hazards. This situation has made the government and the cotton growers realize the importance of adopting non toxic but effective ways of controlling pests. The IPM encompassing following components is perceived the way out of the above problem.

11.1.2.1 Cultural control

152. Cultural practices during the growth period of the crop directly improve the health and general vigour of the plants, while such operations after the last picking in the field and at the

end of the ginning season in the ginning factory indirectly help to keep the pest populations under control.

153. Typical examples for the role of different cultural practices in the control of different pests are given below:

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

b) Timely removal/shredding of cotton sticks and left over bolls and their subsequent destruction, alongwith the burning/destruction of waste of ginning factories help to minimise the pink bollworm infestation to the coming crop.

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

154. These practices should be widely publicised among the growers alongwith the technical guidance on the subject.

11.1.2.2 Resistant varieties

155. The development of crop resistance to diseases and arthropod pests is a long process. However, breeders have succeeded in developing several cultivars possessing resistance against some pests and diseases. The hairiness was considered to confer resistance and this character has been incorporated in most of the cotton varieties cultivated in Pakistan. Moreover, nectariless character has also been incorporated in some cotton varieties to develop resistance against jassids and bollworms. The early maturing varieties escape attack of pink bollworm. The breeding of cultivars resistant to bacterial blight and root rot of cotton has also been advanced. The research institutes engaged in breeding should try to integrate all these characters in one variety without affecting the yield and quality characteristics of the material.

11.1.2.3 Biological control

156. Parasites and predators of various cotton pests when present in sufficient numbers can play an affective role in regulating pest population. In Pakistan predators are more important

than parasites because they are more active in the early part of cotton season. Parasites multiply on bollworm larvae quite late in the season when the crop has already matured.

157. The research has found that in Pakistan about one hundred natural enemies are associated with different cotton pests. The main predators are chrysopa species, onions species, geocoris, spiders and coccinellids. These predators play important role in regulating the sucking pests population and early bollworm damage. Early use of chemicals results in the destruction of these beneficial insects and their absence causes resurgence of pests. In view of such importance and cost effectiveness of biological control of pests artificial rearing of predators should be assigned high priority. The government should strengthen its IPM institute for accelerating research and encourage the private companies for commercial rearing and marketing of useful insects and other predators.

11.1.2.4 Microbial control

158. 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.

11.1.2.5 Insect growth regulators

159. 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 analoge. 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.

11.1.2.6 Sex-pheromones

160. 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.

161. 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 agents. Their use should be promoted by extension staff in collaboration with private pesticide companies.

11.1.3 Balanced use of plant nutrients

162. Intensive cropping, imbalanced use of chemical fertilizers, inadequate use of organic manure have caused continuous drain of soil nutrients resulting in soil depletion both in major and minor nutrients. As reported in the last year's price policy for seed cotton, one hectare of this crop, on the average, 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 of 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.

163. To arrest further deterioration of 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. This shall require 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 urged to develop various bio fertilizers and area/crop specific chemical fertilizer prescriptions and ensure their adoption by the growers through extension network of the department.

11.2 Improving Quality and Marketing

164. For the purpose of getting good prices of Pakistan cottons in the domestic and international markets, it is necessary to improve the quality and marketing conditions of cotton. In this respect APCom had suggested a number of non price measures in its previous support price policy reports, but have not been implemented as yet. So these recommendations are reviewed and reiterated for implementation during 2001-02 crop year.

11.2.1 Picking

165. Proper picking plays an important role in improving the cotton quality. It is necessary that in order to get best results, cotton picking should start when about 60 per cent of the bolls have opened. Moreover, picking should be done when the dew has dried. The produce of each variety after picking should be kept separately at dry place. The produce of dirty and infected bolls should not be mixed. For maintaining good quality, produce from the first and last pickings should be kept separate.

11.2.2 Ginning

166. Improved ginning can also help a lot in improving the cotton quality at this stage. The saw gins used in processing, generally, affect the staple strength and length positively. But the saw gins used by our ginning industry are often of poor quality which damage the staple strength and length. So the foreign exchange earned from cotton export are adversely affected. There is a need that pre-ginning cleaners and lint cleaning machinery be installed to improve the cotton quality. For getting lint of best grades, research should be undertaken on different types of

ginning and cleaning machines. To improve the situation, APCom in its support price policy reports for 1999-00 and 2000-01 crops recommended the following.

- 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.

167. The Ministry of Food, Agriculture and Livestock had prepared and submitted a PC I for the establishment of Ginning Research Institute, Multan. But, it has been rejected on the grounds that it should be in the private sector. The ginners are ready to establish this institute and contribute Rs 5 per bale but they need that an SRO should be issued in this respect.

11.2.3 Underweighment and undue deductions

168. There have been common practices of underweighment and undue deductions on the part of beoparies and ginneries/commission agents throughout the country. The complaints in this respect have been raised by growers in the Standing Committee Meeting of Seed Cotton, held at Multan and during the APCom field survey in the main cotton growing areas. In order to check these malpractices, supervisory committees consisting of representatives of local Agriculture Department, Market Committee, growers and cotton dealers may be constituted.

11.2.3 Proper packing and labeling

169. Proper packing and labeling of cotton lint improves the presentation. False labeling brings bad name for the country. It is therefore of utmost importance that the truthful labeling and proper packing should be ensured. MINFAL should ensure proper labeling of cotton lint, in accordance with the variety actually contained in the pack.

11.2.5 Marketing of cotton

170. Cotton marketing system currently in vogue suffers from a number of drawbacks. Phutti payments are often linked with the sale of lint by the ginneries. If due to one or the other reason cotton lint remains unsold with the ginneries or the payments of ginners remain pending with the

textile mills, the phutti payments to the growers are also held up. In the marketing of seed cotton growers are cheated by the middlemen and industry. It has been mentioned earlier that underweighment and undue deductions on the part of beoparies and commission agents are common throughout the country. These malpractices substantially reduce net price to the growers. It was also argued in the meeting of Standing Committee on Cotton held on 26-2-2001 that due to presence of a large number of intermediaries in the cotton marketing chain without much contribution to the value added, the cost of marketing goes up. Resultantly the growers' net share in rupee spent by the textile mills on the purchase of lint gets reduced to a considerable level.

171. In the meeting referred above it was also brought out that there are two different units of measurement in the seed cotton and cotton lint transactions. Growers selling phutti receive prices in term of maunds of 40 kgs while the ginneries sell cotton lint in term of maunds of 37.324 kgs. The differential in measuring units induce unscrupulous commission agents or the ginneries to cheat the growers in weighment. Thus, there is a need to introduce uniform units at both the stages of measurement.

172. The meeting also noted the problems of introducing the quality payments in cotton marketing. Though the KCA has started announcing prices of lint according to the grades and staple length, yet the textile mills do not pay the price to ginneries according to these standards. Since they are the major buyer of cotton in the country, the quality payments in cotton will remain a dream till that time the textile industry starts to pay according to quality.

173. Thus, in view of the above, it is pertinent that the marketing system of cotton be studied in detail with special emphasis on marketing costs, delayed payments, problems in payments of seed cotton to the growers according to quality, underweighment and undue deductions from the cotton growers and such other problems so that growers' share in the rupee spent by the consumers may be increased.

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Officers		
1	Mr. Muhammad Ashiq (Coordinator)	Chief
2.	Mr. M. Iftikhar Ahmad Khan	Chief
3.	Mr. M. B. Malik	Chief
4.	Mr. M. B. Siddiqui	Chief
5.	Mian Muhammad Mukhtar	Deputy Chief
6.	Mr. Abdul Rauf Chaudhry	Deputy Chief
7.	Mr. Sohail Muhammad Khan	Deputy Chief
8.	Mr. G. S. Soomro	Deputy Chief
9.	Mrs. Viqar-un-Nisa	Deputy Chief
10.	Mr. Asghar Ali	Deputy Chief
11.	Mr. Rafique Ahmad Khan	Deputy Chief
12.	Mr. Manzoor Sabir	Assistant Chief
13.	Mr. Sherzada Khan	Assistant Chief
14.	Mr. Muhammad Ikram	Assistant Chief
15.	Mr. Sardar Ali Khan	Assistant Chief
16.	Syed Wasim Raza Zaidi	Assistant Chief
17.	Mr. Sajjad Hussain	Assistant Chief
18.	Mr. Muhammad Amin	Assistant Chief
19.	Mr. Hussain Ali Turi	Assistant Chief
20.	Syed Riaz Ali Shah	Assistant Chief
Other Staff		
21.	Mr. Muhammad Rauf (Composed the Report)	Stenographer
22.	Mr. Hafeez Ahmad	Stenographer
23.	Mr. Mushtaq Ahmad	Stenographer
24.	Mr. Muhammad Altaf	Stenographer
25.	Mr. Shamir Ahmad	Stenographer
26.	Mr. Muhammad Hussain	Stenotypist
27.	Mr. Amir Shah	LDC
28.	Mr. Muhammad Naeem	DMO

Member (Economics)

ANNEX-I

RECOMMENDED SOWING TIMES OF COTTON

S.No.	Province	District	Variety	Time of sowing
A.	**Punjab**	Lahore, Gujranwala, Hafizabad, Sialkot, Narowal, Gujrat	Desi	From last week of March to mid April
		Shaikhupura	Desi	Mid March to Mid April
			Amercian	10th May to 15th June
		Rawalpindi, Attock, Jhelum, Chakwal	Desi	From last week of March to mid April
		Kasur	Desi	2nd fortnight of April
			American	20th May to 15th June
		Faisalabad, Sargodha Mandi Bahauddin	Ameican	1st. May to 15th June
		Khushab, Bhakkar	American	15th May to 15th June
			Desi	Mid March to early April
		Jhang, T.T. Singh	American	1st May to 15th June
		Mianwali	American	10th May to 15th June
			Desi	Mid March to early April
		Sahiwal, Pak. Pattan, Okara	American	1st May to 15th June
		Multan, Lodhran	American	1st May to last June
		Vehari	American	1st May to last June
		Khanewal	American	15th May to 15th June
		Bahawalpur, R.Y. Khan	American	1st May to 15th June
		Bahawalnaghar	American	1st May to 20th June
			Desi	Whole month of April
		Muzaffargarh	American	1st May to last June
		Layyah	American	---do----
		D.G. Khan, Rajanpur	American	----do---
B.	**Sindh**	Thatta	American	15th Feb. to 15th March
		Mirpur Khas, Umer Kot, Tharparkar	American	March to 15th April
		Hyderabad, Badin	American	10th April to 10th May
		Sanghar	American	Mid April to mid May
		Dadu, Khairpur, Sukkar, Ghotki,	American	Mid May to 10th June
		Nawabshah	American	1st May to 31st May
C.	**NWFP**	D.I. Khan	American	3rd week of April to end of May

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

ANNEX-II

PROVINCE-WISE AREA,PRODUCTION AND YIELD OF SEED COTTON IN PAKISTAN:1990-91 TO 2000-2001

YEAR	PUNJAB	SINDH	NWFP	BALOCH	PAKISTAN
AREA		***----------000 hectares---------***			
1990-91	2124.6	536.6	0.8	0.2	2662.2
1991-92	2286.9	547.6	0.8	0.2	2835.5
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	0.3	21.6	2931.9
YIELD		***----------kgs per hectare-------***			
1990-91	681	356	276	425	615
1991-92	849	436	361	425	769
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	594	696	340	397	611
PRODUCTION		***----------000 bales----------***			
1990-91	8501.3	1124.6	1.3	0.5	9627.7
1991-92	11416.8	1403.2	1.7	0.5	12822.2
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	8336.0	2141.1	0.6	50.4	10528.1

Note: One bale =170.09 kgs = 375 lbs

Sources:
1. For 1990-91 to 1998-99: Agricultural Statistics of Pakistan 1998-99, MINFAL, Islamabad.
2. For 1999-00: Final estimates supplied by MINFAL, Islamabad.
3. For 2000-01: Final estimates of Punjab, Sindh and Second estimates for NWFP and Balochistan supplied by respective Provincial Agriculture Departments.

ANNEX-III

PROVINCE-WISE AREA (IN ACRES), PRODUCTION AND YIELD OF SEED COTTON IN PAKISTAN :1990-91 TO 2000-01

YEAR	PUNJAB	SINDH	NWFP	BALOCH	PAKISTAN
AREA		***----------000 acres---------***			
1990-91	5250.1	1326.0	2.0	0.5	6578.6
1991-92	5651.2	1353.2	2.0	0.5	7006.8
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	0.7	53.4	7245.0
YIELD		***----------kgs per acre-------***			
1990-91	275	144	112	172	249
1991-92	344	176	146	172	311
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
1999-2000	260	258	138	200	259
2000-2001	240	281	138	161	247
PRODUCTION		***----------000 bales----------***			
1990-91	8501.3	1124.6	1.3	0.5	9627.7
1991-92	11416.8	1403.2	1.7	0.5	12822.2
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	8336.0	2141.1	0.6	50.4	10528.1

Note: One bale =170.09 kgs = 375 lbs

Sources:
1. For 1990-91 to 1998-99: Agricultural Statistics of Pakistan 1998-99, MINFAL, Islamabad.
2. For 1999-00: Final estimates supplied by MINFAL, Islamabad
3. For 2000-01: Final estimates of Punjab, Sindh and Second estimates for NWFP and Balochistan supplied by respective Provincial Agriculture Departments.

ANNEX-IV

DISTRICT-WISE AREA AND PRODUCTION OF SEED COTTON: AVERAGE OF 1996-97 TO 1999-00

Area: 000 hectares
Production: 000 bales
Yield: Kgs/ha

S.No.	Province/District	Area	Percentage	Production	Percentage	Yield
	PUNJAB					
1	R.Y.Khan	305.13	10.33	1003.13	10.30	559
2	Bahawalpur	256.97	8.70	985.67	10.12	652
3	Vehari	240.13	8.13	734.27	7.54	520
4	Bahawalnagar	187.93	6.36	689.70	7.08	624
5	Lodhran	195.97	6.63	647.33	6.65	562
6	Khanewal	187.23	6.34	628.00	6.45	570
7	Rajanpur	129.50	4.38	526.40	5.41	691
8	Multan	154.73	5.24	463.13	4.76	509
9	M.Garh	177.10	5.99	455.47	4.68	437
10	D.G.Khan	96.47	3.26	370.20	3.80	653
11	Sahiwal	81.33	2.75	203.20	2.09	425
12	Pakpatan	63.27	2.14	149.73	1.54	403
13	Jhang	60.93	2.06	121.73	1.25	340
14	T.T.Singh	41.93	1.42	105.70	1.09	429
15	Layyah	36.57	1.24	93.77	0.96	436
16	Faisalabad	39.83	1.35	91.87	0.94	392
17	Okara	30.10	1.02	74.17	0.76	419
18	Kasur	10.70	0.36	23.83	0.24	379
19	Sargodha	7.57	0.26	15.03	0.15	338
20	Bhakkar	6.23	0.21	14.73	0.15	402
21	Mianwali	5.07	0.17	11.50	0.12	386
22	M.B.Din	2.40	0.08	3.00	0.03	213
23	Sheikhupura	1.33	0.05	2.67	0.03	340
24	Khushab	0.80	0.03	1.13	0.01	241
25	Jhelum	0.40	0.01	0.43	0.00	184
26	Chakwal	0.40	0.01	0.40	0.00	170
27	Gujranwala	0.13	0.00	0.13	0.00	170
	PUNJAB Sub-total	**2320.17**	**78.51**	**7416.33**	**76.16**	**544**
	SINDH					
1	Sanghar	126.53	4.28	522.97	5.37	703
2	Ghotki	102.83	3.48	361.00	3.71	597
3	Nawab shah	69.07	2.34	273.87	2.81	674
4	Khairpur	79.20	2.68	271.40	2.79	583
5	Hyderabad	61.40	2.08	233.67	2.40	647
6	N.Feroze	57.50	1.95	210.17	2.16	622
7	Mirpurkhas	50.77	1.72	167.57	1.72	561
8	Sukkur	33.60	1.14	119.40	1.23	604
9	Umer Kot	34.43	1.17	106.37	1.09	525
10	Dadu	3.00	0.10	10.03	0.10	569
11	Badin	2.90	0.10	5.80	0.06	340
12	Thatta	0.10	0.00	0.10	0.00	170
	SINDH Sub-total	**621.33**	**21.03**	**2282.33**	**23.44**	**625**
	NWFP Sub-total	**0.40**	**0.01**	**0.70**	**0.01**	**298**
	BALOCH. Sub-total	**13.30**	**0.45**	**38.63**	**0.40**	**494**
	PAKISTAN Total	**2955.20**	**100.00**	**9738.00**	**100.00**	**560**

Notes:

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: 2000-01 AND 2001-02 CROPS

S.No	Operations / Inputs	Average No. of operations / acre	2000-01 crop		2001-02 crop		Change in 2001-02 over 2000-01
			Cost per unit	Cost per acre	Cost per unit	Cost per acre	
1	2	3	4	5 = 3 * 4	6	7 = 3 * 6	8=7-5
				-------- Rupees---------			
1.	Land preparation:						
	1.1 Deep ploughing	0.386	325.00	125.45	350.00	135.10	9.65
	1.2 Ploughing	2.154	120.00	258.48	130.00	280.02	21.54
	1.3 Planking	0.318	60.00	19.08	65.00	20.67	1.59
	1.4 Ploughing+planking	2.828	120.00	339.36	130.00	367.64	28.28
	1.5 Levelling (tractor hrs)	0.597	160.00	95.52	175.00	104.48	8.96
2.	Seed and sowing operations:						
	2.1 Seed (kgs)	9.866	32.00	315.71	35.00	345.31	29.60
	2.2 Delinting of seed	-	-	98.00	-	100.00	2.00
	2.3 Sowing						
	2.3.1 Drilling	0.939	120.00	112.68	130.00	122.07	9.39
	2.3.2 Ploughing+planking	0.076	120.00	9.12	130.00	9.88	0.76
	2.3.3 Manual labour for sowing, bund making and gap filling (m.days)	0.319	90.00	28.71	90.00	28.71	0.00
3.	Irrigation: * (Nos)						
	3.1 Canal	2.888	-	84.56	-	93.02	8.46
	3.2 Private tubewell	2.922	174.00	508.43	225.00	657.45	149.02
	3.3 Mixed	1.093	125.00	136.63	162.00	177.07	40.44
4.	Labour for irrigation and water course cleaning (m.days)	4.157	90.00	374.13	90.00	374.13	0.00
5.	Interculture:						
	5.1 With tractor	1.667	120.00	200.04	130.00	216.71	16.67
	5.2 With bullocks	1.508	120.00	180.96	130.00	196.04	15.08
	5.3 Manual weeding/thining (m.days)	2.404	90.00	216.36	90.00	216.36	0.00
6.	Plant Protection including application (weedicides + pesticides)	5.779	350.00	2022.65	400.00	2311.60	288.95
7.	Farm Yard Manure including transport and application 50% (trolly load)	0.319	495.00	78.95	550.00	87.73	8.77
8.	Fertilizers: (bags)						1450.62
	8.1 DAP	0.628 ✓	640.00	401.92	710.00	445.88	43.96
	8.2 SSP	0.057	250.00	14.25	260.00	14.82	0.57
	8.3 NP	0.262 ✓	460.00	120.52	475.00	124.45	3.93
	8.4 TSP	0.001	550.00	0.55	572.00	0.57	0.02
	8.5 SOP	0.007 ✓	540.00	3.78	686.00	4.80	1.02
	8.6 Urea	1.780	325.00	578.50	390.00	694.20	115.70
	8.7 CAN	0.102	230.00	23.46	260.00	26.52	3.06
	8.8 Gypsum	0.017	35.00	0.60	40.00	0.68	0.09
	8.9 NPK	0.012	600.00	7.20	665.00	7.98	0.78
9.	Fertilizer transport and application	2.866	12.50	35.83	15.00	42.99	7.17
10.	Mark up on investment @ 14 % per annum for 8 months on items 1 to 9 minus 3(1)	-	-	588.64	-	663.96	75.32
11.	Management charges for 8 months	-	-	247.00	-	260.00	13.00
12.	Land rent for 8 months	-	4000.00	2666.67	4500.00	3000.00	333.33
13.	Land revenue including local rate, chaukidara, etc.	-	-	5.00	-	-	-5.00
14.	Payment to pickers (Rs/ 40 kgs)	16.770	70.00	1173.90	70.00	1173.90	0.00
15.	Cutting of cotton sticks	-	-	173.00	-	173.00	0.00
16.	Gross cost (item 1 to 15)	-	-	11245.62	-	12477.73	1232.11
17.	Value of cotton sticks	-	-	173.00	-	173.00	0.00
18.	Net cultivation cost (item 16-17)	-	-	11072.62	-	12304.73	1232.11
19.	Yield per acre (kgs)	-	-	670.80	-	670.80	0.00
20.	Cost per 40 kgs at farm level						
	20.1 including land rent	-	-	660.26	-	733.73	73.47
	20.2 excluding land rent	-	-	501.25	-	554.84	53.59
21.	Marketing expenses: (Rs/40 kgs)	-	-	10.00	-	14.00	4.00
22.	Cost per 40 kgs at market/ginnery:						
	22.1 including land rent	-	-	670.26	-	747.73 ✓	77.47
	22.2 excluding land rent	-	-	511.25	-	568.84	57.59

* hrs/irrigation
Canal=2.27 T.well=2.89 Mixed=2.07

ANNEX-VI

AVERAGE FARMERS' COST OF PRODUCTION ESTIMATES OF SEED COTTON IN SINDH: 2000-01 AND 2001-02 CROPS

S.No	Operations / Inputs	Average No. of operations/ acre	2000-01 crop		2001-02 crop		Change in 2001-02 over 2000-01
			Cost per unit	Cost per acre	Cost per unit	Cost per acre	
1	2	3	4	5=3*4	6	7=3*6	8=7-5
				------ Rupees------			
1	Land preparation:						
	1.1 Deep ploughing	0.336	330.00	110.88	360.00	120.96	10.08
	1.2 Ploughing	2.786	180.00	501.48	190.00	529.34	27.86
	1.3 Planking	0.022	90.00	1.98	95.00	2.09	0.11
	1.4 Ploughing+planking	0.730	180.00	131.40	190.00	138.70	7.30
	1.5 Levelling (tractor hrs)	0.843	180.00	151.74	190.00	160.17	8.43
2.	Seed and sowing operations:						
	2.1 Seed (kgs)	11.638	32.00	372.42	35.00	407.33	34.91
	2.2 Delinting of seed		-	116.00	-	120.00	4.00
	2.3 Sowing						
	2.3.1 Ridging	0.184	180.00	33.12	190.00	34.96	1.84
	2.3.2 Drilling	0.816	180.00	146.88	190.00	155.04	8.16
	2.3.3 Manual labour for sowing, bund making and gap filling (m. days)	0.531	90.00	47.79	90.00	47.79	0.00
3.	Irrigation: * (Nos)						
	3.1 Canal	4.882	-	93.09	-	93.09	0.00
	3.2 Private tubewell	0.344	132.00	45.41	145.00	49.88	4.47
	3.3 Mixed	0.368	116.00	42.69	127.00	46.74	4.05
4.	Labour for irrigation and water course cleaning (m.days)	3.312	90.00	298.08	90.00	298.08	0.00
5.	Interculture:						
	5.1 With tractor	0.351	180.00	63.18	190.00	66.69	3.51
	5.2 With bullocks	0.815	180.00	146.70	190.00	154.85	8.15
	5.3 Manual weeding/thining (m.days)	7.069	90.00	636.21	90.00	636.21	0.00
6.	Plant Protection including application (weedicides + pesticides)	3.651	476.00	1737.88	476.00	1737.88	0.00
7.	Farm Yard Manure (including transport and application) 50% (trolly load)	0.157	1220.00	95.77	1300.00	102.05	6.28
8.	Fertilizers: (bags)						
	8.1 DAP	0.835	640.00	534.40	710.00	592.85	58.45
	8.2 NP	0.088	460.00	40.48	475.00	41.80	1.32
	8.3 SOP	0.014	540.00	7.56	686.00	9.60	2.04
	8.4 Urea	1.708	325.00	555.10	390.00	666.12	111.02
	8.5 CAN	0.202	230.00	46.46	260.00	52.52	6.06
	8.6 AS	0.002	280.00	0.56	303.00	0.61	0.05
	8.7 NPK	0.007	600.00	4.20	665.00	4.66	0.46
9.	Fertilizer transport and application	2.856	12.50	35.70	15.00	42.84	7.14
10.	Mark up on investment @ 14 % per annum for 8 months on items 1 to 9 minus 3(1)	-	-	551.05	-	580.51	29.46
11.	Management charges for 8 months	-	-	247.00	-	260.00	13.00
12.	Land rent for 8 months	-	2000.00	1333.33	2500.00	1666.67	333.33
13.	Land revenue including local rate, chaukidara, etc.	-	-	5.00	-	-	-5.00
14.	Payment to pickers (Rs/ 40 kgs)	15.060	70.00	1054.20	80.00	1204.80	150.60
15.	Cutting of cotton sticks	-	-	272.00	-	272.00	0.00
16.	Gross cost (item 1 to 15)	-	-	9459.73	-	10296.81	837.09
17.	Value of cotton sticks	-	-	272.00	-	272.00	0.00
18.	Net cultivation cost (item 16-17)	-	-	9187.73	-	10024.81	837.09
19.	Yield per acre (kgs)	-		602.40		602.40	0.00
20.	Cost per 40 kgs at farm level						
	20.1 Including land rent	-	-	610.07	-	665.66	55.58
	20.2 excluding land rent	-	-	521.54	-	554.99	33.45
21.	Marketing expenses: (Rs/40 kgs)	-	-	10.00	-	14.00	4.00
22.	Cost per 40 kgs at market/ginnery:						
	22.1 including land rent	-	-	620.07	-	679.66	59.58
	22.2 excluding land rent	-	-	531.54	-	568.99	37.45

* hrs/irrigation
Canal=1.85 T.well=2.19 Mixed=1.924

Notes for Annex-V and VI

1. The physical input-output parameters for estimating cost of production of Seed Cotton, 2001-02 crop, have been adopted from the Support Price Policy for Seed cotton, 2000-01 Crop, APCom Series No 186.

2. The inputs prices and custom hire rates of field operations involved in cotton cultivation have been revised in the light of data collected through mini field survey conducted by APCom during January, 2001 in major cotton producing regions of the Punjab and Sindh, discussion in the meeting of the Standing Committee on Seed cotton, held on 26th February, 2001 and information provided by the Provincial Agriculture Departments and Farmers' Associations.

3. The cost of delinting of seed has been revised in the light of information provided by the Punjab Seed Corporation , Lahore.

4. The cost of supplementary irrigation has been revised in view of rises in the prices of diesel @ about 34 per cent during February, 2000 to March, 2001. In the cost estimation analysis, the decline in the prices of diesel on 15th March, 2001 has been counted for. The cost of electric tube-wells remained constant because the G.S.T. @ 15 per cent effective from January 2000 is adjusted through reduction of additional surcharge to make the electric bill neutral. Based on the ratios of electric and diesel tube-wells at 15:85 in the Punjab and 72:28 in Sindh as reported in the Agricultural Statistics of Pakistan, 1999-00, the weighted average increase in energy charges has been estimated as 29.3 per cent in the Punjab and 9.8 per cent in Sindh.

5. The cost of FYM has been revised in view of rises in the prices of fertilizers.

6. The transportation costs have been adjusted in the light of rises in the prices of diesel.

7. Management charges for a manager looking after a 25-acre farm and devoting one-forth of his time to the managerial activities have been worked at Rs 3250 per month in view of the latest salary package for a Field Assistant at the 10th stages in BPS-6, including allowances, inter alia, 25 per cent increase in the budget 1999-00, ad-hoc relief of Rs 100 per month announced in December, 1999 and interim relief of Rs 2000 once a year announced in the budget, 2000-01.

8. Land rent is the major item of the cost of production. There is no precise measure for updating the land rentals. However, keeping in view the observations obtained during the field survey and discussion made with knowledgeable growers in the meeting of APCom's Standing Committee, land rentals have been enhanced accordingly.

ANNEX-VII

ECONOMICS OF COTTON AND COMPETING CROPS AT PRICES REALIZED BY GROWERS: 2000-01 CROPS

Province/crops/ crop combinations	Crop duration	Water used	Gross cost	Cost of purcha-sed inputs	Gross revenue	Gross margin	Net income	Output-input ratio	Revenue per		
									Rupee of Purchased inputs	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	11300	4777	15182	10406	3882	1.34	3.18	63.26	690.10
2 Basmati paddy	180	58	8330	4605	6700	2096	-1630	0.80	1.46	37.22	115.52
3 IRRI paddy	180	62	7255	4017	5848	1831	-1407	0.81	1.46	32.49	94.32
4 Wheat	180	17	8456	3595	8057	4462	-399	0.95	2.24	44.76	473.95
5 Sunflower (spring)	144	22	6918	2158	7665	5507	747	1.11	3.55	53.23	348.41
6 Cotton + wheat	420	39	19756	8372	23239	14868	3483	1.18	2.78	55.33	595.88
7 Cotton + sunflower	384	44	18218	6935	22847	15927	4629	1.25	3.29	59.50	519.25
8 Suagarcane	394	44	13547	4485	21001	16516	7454	1.55	4.68	53.30	477.30
Sindh											
1 Cotton	240	18	9450	3921	13389	9468	3939	1.42	3.41	55.79	743.85
2 IRRI paddy	180	56	6365	2942	5908	2965	-458	0.93	2.01	32.82	105.49
3 Wheat	180	15	7118	2883	7392	4509	274	1.04	2.56	41.07	492.83
4 Sunflower (Spring)	144	22	6918	2158	7665	5507	747	1.11	3.55	53.23	348.41
5 Cotton+Wheat	420	33	16581	6804	20781	13977	4200	1.25	3.05	49.48	629.73
6 Cotton + Sunflower	384	40	16368	6079	21054	14975	4700	1.29	3.46	54.83	526.36
7 Suagarcane	488	58	15048	5740	26925	21185	11877	1.79	4.69	55.17	464.22

Notes for the Annex-VII

1. The economic analysis presented in the above exercise is based on the input-output prices of the crops raised during 2000-01 season.

2. The data regarding input-output parameters have been adopted from the APCom's support price policies for sugarcane, seed cotton, rice paddy, wheat and Non-traditional oilseeds, 2000-01 crops. To incorporate the escalations in input prices which occurred during the growing period of 2000-01 crops, some marginal revisions have been made as under:

   2.1 The cost of supplementary irrigation for sugarcane and seed cotton has been revised in view of 11 per cent increase in diesel prices during March 2000 and for wheat by 12.96 per cent effected in September 2000. The cost of electric tubewells remained constant because the G.S.T @ 15 per cent effective from January 2000 is adjusted through reduction in additional surcharge to make the electric bill neutral. The ratio of diesel and electric tubewels in the Punjab is 85 and 15 per cent and in Sindh 28 and 72 per cent. Based on these ratios, the expenses on supplementary irrigation have been revised by applying the weighted average increase in diesel prices at 9.35 per cent in the Punjab and 3.08 per cent in Sindh for seed cotton and at 9.35 per cent in Punjab for sugarcane while at 11.02 per cent for the Punjab and 3.63 per cent for 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 during 2000-01 season.

   2.3 The value of kind payments has been revised in view of prices applicable during the post-harvest for the respective crops.

   2.4 The marketing expenses have been revised as applicable during the post-harvest for the respective crops.

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 Government is the major buyer of wheat during the post-harvest season. Accordingly, the bulk of the transactions of wheat take place at the support price. As the support price of wheat for 2000-01 has been maintained at Rs 300 per 40 kgs, the same has been adopted for the current analysis.

4.2 The rice paddy is primarily transacted by the private sector in the open market. The wholesale market prices of rice paddy during the post-harvest (Nov-Dec 2000) in the main producing area markets have averaged at Rs 283 per 40 kgs for Basmati-385 and Rs 176 for IRRI in the Punjab as reported by the Directorate of Agriculture (E&M), Lahore. The same for Sindh has been reported at Rs 162 per 40 kgs of IRRI paddy in the APCom's field survey.

4.3 The wholesale market price of seed cotton during the post-harvest months of September to December, 2000 in the Multan market has averaged at Rs 907 per 40 kgs in the Punjab as reported by the Directorate of Agriculture (E&M) Lahore. The same for Sindh in major producing area markets has been reported at Rs 883 by the PCCC, Karachi during September to December 2000.

4.4 The 2000-01 sunflower crop is yet to be harvested. The market prices of this crop are not regularly reported by any agency. However, the average price in the open market was reported by the PODB and APCom's Standing Committee at Rs 525 per 40 kgs for the last crop, which has been adopted.

4.5 The market prices of sugarcane are not available from any agency. However, the mill-gate prices in the major cane producing areas of Punjab were reported around Rs 45 per 40 kgs in view of the APCom field survey and information media. In Sindh, the price of sugarcane was hovering around Rs 50 per 40 kgs.

5. The prices for various commodities have been adjusted for the marketing expenses to make them effective at the farm level. In case of sugarcane, these expenses amount to Rs 4.90 per 40 kgs. The market expenses have been taken at Rs 12 per 40 kgs for rice paddy and seed cotton and Rs 14 per 40 kgs 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 2000-01 CROP

Table

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. 18.04 per nutrient kg (i.e. Rs. 14.13, 22.30 and 21.60 per nutrient kg of N, P and K at the recommended NPK ratio of 2:1:1 (a)	180.40	180.40	180.40	180.40
3.	Indirect cost due to the application of additional fertilizer as detailed below (b)	90.62	107.49	124.38	141.25
	3.1 Transportation and application charges of 19.15 kgs of fertilizer @ Rs.15.00 per bag of fertilizer	5.75	5.75	5.75	5.75
	3.2 Picking charges for additional produce @ Rs.75.00 per 40 kgs	56.25	70.31	84.38	98.44
	3.3 Marketing charges for additional produce @ Rs. 15.00 per 40 kgs	11.25	14.06	16.88	19.69
	3.4 Mark up on direct cost of fertilizer (item 2+3.1) for 8 months @ 14% per annum	17.37	17.37	17.37	17.37
4.	Total additional cost (item 2+3)	271.02	287.89	304.78	321.65
5	Value of additional produce @ Rs.908 per 40 kgs	681.00	851.25	1021.50	1191.75
6	Benefit cost ratio (item 5 divided by item 4)	2.51	2.96	3.35	3.71

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 2000-01 crop taken respectively as 325, 640 and 540 per bag of 50 kgs each.

a) The rates of indirect cost items are the average of the rates used in the COP estimates of the Punjab and Sindh for 2001-02 crop.

b) Average of the market price of 2000-01 crop for different varieties exclusive of "Desi" varieties for the period September, 2000 to January 2001 have been used.

ANNEX-IX

PRICE OF SEED COTTON AS WORKED BACK FROM COTTON YARN (20's) PRICE AT FAISALABAD (SEPTEMBER,2000 TO ,JANUARY., 2001)

		Rupees
1	Average price of cotton yarn (20's) per bundle of 4.54 kgs	466.00
2	Average price of cotton yarn (20's) per kg	102.64
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)	73.98
6	Value of one kg of lint (item 5 divided by 1.16)	63.78
7	Value of 40 kgs lint	2551.14
8	Sales tax @ 15 per cent of item 9	332.76
9	Net value of 40 kgs lint after deducting sales tax (item 7 minus 8)	2218.39
10	Storage and transport cost from gin to mill per 40 kgs	30.00
11	Ex-gin price of 40 kgs lint (item 9 minus 10)	2188.39
12	Value of 80 kgs of cotton seed (b)	608.00
13	Ginning charges for 120 kgs seed cotton	250.00
14	Seed cotton price for 120 kgs (item 11+12 minus item 13) (c)	2546.39
15	Seed cotton price per 40 kgs (item 14 divided by 3)	848.80

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 September, 2000 to January, 2001 at Multan market was Rs 304 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 Ginners Association (PCGA), Karachi.
4 All Pakistan Textile Mills Association (APTMA), Karachi.

ANNEX- X

CIF NORTH EUROPE PRICES OF VARIOUS COTTONS:1990-91 TO 2000-01

Year		Sindh/ Punjab Afzal 1-1/32"	Index- B Cottons	Orleans/ Texas Middling 1-1/32"	Difference between Sindh/ Punjab Afzal 1-1/32" and	
					Index- B Cottons	Orleans/ Texas 1-1/32"
		---------- US Cents per pound ----------				
1990-91		76.32	77.22	79.78	-0.90	-3.46
1991-92		56.67	57.06	62.37	-0.39	-5.70
1992-93		53.99	53.25	58.31	0.74	-4.32
1993-94		61.45	69.39	71.47	-7.94	-10.02
1994-95		75.89	75.44	83.53	0.45	-7.64
1995-96		80.95	80.48	90.11	0.47	-9.16
1996-97		76.23	75.27	79.91	0.96	-3.68
1997-98		72.23	68.00	73.77	4.23	-1.54
1998-99		51.28	68.00	70.23	-16.72	-18.95
1999-00		47.46	49.28	52.35	-1.83	-4.89
2000-01		57.60	60.33	61.15	-2.73	-3.55
	September	53.75	56.85	63.31	-3.10	-9.56
	October	54.13	57.45	60.13	-3.32	-6.00
	November	58.75	65.05	61.00	-6.30	-2.25
	December	61.25	62.00	62.13	-0.75	-0.88
	January	60.13	60.30	59.19	-0.75	-0.88

Sources:

1. Upto 1995-96: Cotton Outlook (various issues)
2. For 1996-97: Reuters.
3. For 1997-98: (i) Cotton Outlook (various issues) for Sindh/Punjab Afzal 1-1/32".
   (ii) Reuters for Orleans /Taxas Middling 1-1/32" and Index - B Cottons
4. For 1998-99: Reuters.
5. For 1999-00 & and 2000-01 Cotton Outlooks (various issues)

ANNEX- XI

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

S. No	Item	2000-01 (Sept - Jan)	1996- 97 to 2000-01 (a)
		US Cents per pound	
1.	Actual average export price	45	55
		OR Rupees per 40 kgs	(b)
		2349	2871
2.	Marketing expenses (export & purchase incidentals, insurance & financial expenses)	175	175
3.	Ex- gin price of lint (item 1- item 2)	2174	2696
4.	Value of 80 kgs of cotton seed (c)	608	608
5.	Ginning charges for 120 kgs of seed cotton (d) including ginning losses	250	250
6.	Value of 120 kgs of seed cotton (e) (items 3 +4 - item 5)	2532	3054
7.	Seed cotton price per 40 kgs (item 6 / 3)	844	1018

Notes:

a) Price of 2000-01 is for the period Sept to Jan

b) At exchange rate of one US $ = 59.20 Pak Rupees

c) At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

(d) Previously ginning Charges and ginning loss togather were taken at Rs 325 per 4 kgs of lint. Now it has been reported that increase in ginning out turn over time ha compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

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

Sources:

1. FBS , Karachi 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 (a)		'Sindh Punjab Afzal 1-1/32"	
		2000-01 (Sept - Jan)	1996-97 to 2000-01	2000-01 (Sept - Jan)	1996-97 to 2000-01 (a)
		---------- US Cents per pound ----------			
1	Average cif North Europe quotations	60	64	58	61
2.	Freight charges	5	5	5	5
3.	Export price (item 1 - item 2)	55	59	52	56
4.	Insurance, agents commission, and port handling charges @ 4% of export price	2	2	2	2
5.	Net export price (item 3 - item 4)	53	57	50	53
		---------- Rupees per 40kgs (b) ----------			
		2761	2953	2624	2792
6.	Marketing expenses (export & purchase incidentals, insurance & financial expenses	175	175	175	175
7.	Ex- gin price of lint per 40 kgs (item 5 - item 6)	2586	2778	2449	2617
8.	Value of 80 kgs of cotton seed (c)	608	608	608	608
9.	Ginning charges for 120 kgs of seed cotton including ginning losses (d)	250	250	250	250
10.	Value of 120 kgs of seed cotton (e) (items 7 + 8 - item 9)	2944	3136	2807	2975
11.	Seed cotton price per 40 kgs (item 10 / 3)	981	1045	936	992

Notes:

(a) Price of 2000-01 are pertain to Sept to Jan

(b) Exchange rate of one US $ = 59.20 Pak Rupees

(c) At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

(d) Previously ginning Charges and ginning loss togather were taken at Rs 325 per 40 kgs of lint. Now it has been reported that increase in ginning out turn over time has compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

(e) 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 items 2 and 7.
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, 2001, DECEMBER, 2001 AND MARCH, 2002)

S. No	Item	Prices calculations
		US Cents per pound
1.	Future contract price as on Feb, 2, 2001	61
2.	Grade and staple discount	4
3.	Discount on account of inland transportation and certification of stocks	6
4.	Parity price of Afzal 1-1/32" at Karachi	52
		OR Rupees Rs per 40 kgs (a)
		2692
5.	Marketing expenses (export & purchase incidentials, insurance & financial expenses	175
6.	Ex- gin price of lint per 40 kgs (item 4 - item 5)	2517
7.	Value of 80 kgs of cotton seeds (b)	608
8.	Ginning charges for 120 kgs of seed cotton including ginning losses (c)	250
9.	Value of 120 kgs of seed cotton (d) (items 6 + 7 - item 8)	2875
10.	Seed cotton price per 40 kgs (item 9 / 3)	958

Notes:

a) Exchange rate of one US $ = 59.20 Pak Rupees.

b) At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

c) Previously ginning Charges and ginning loss togather were taken at Rs 325 per 40 kgs of lint. Now it has been reported that increase in ginning out turn over time has compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

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

Sources:

1.
2. Cotton Outlook of Feb, 2, 2001: for futures contract price.
3. KCA, for items 2,3 and 5.
4. Pakistan Cotton Ginners Association for ginning charges.
   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	2000-01 (Sept -Jan)	1996- 97 to 2000-01 (a)
		US Cents per kg	
1.	Average fob price per kg	188	217
		OR Rupees per kgs (b)	
		112	129
2.	Fob expenses per kg (transport cost, wharfage, port handling, forwarding, adhesive & EDC charges)	2	2
3.	Export packing cost per kg	1	1
4.	Value of 1 kg yarn (item 1 - (items 2 + 3)	109	126
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 (c) (items 4 +5 -item 6)	80	97
8.	Price of one kg cotton lint	69	84
	OR		
	Price of 40 kgs cotton lint	2768	3353
9.	Transport cost from ginnery to mill and local tax	30	30
10.	Ex-gin price of 40 kgs lint (item 8 - item 9)	2738	3323
11.	Value of 80 kgs cotton seed (d)	608	608
12.	Ginning charges for 120 kgs of seed cotton Including ginning losses (e)	350	350
13.	Seed cotton price of 120 kgs (f) (items 10+11 - item 12)	2996	3581
14.	Seed cotton price per 40 kgs (item 13/3)	999	1194

Notes:

a) Price of 2000-01 are for the period Sept to Jan

b) Exchange rate of one US $ = 59.20 Pak Rupees

c) 1.16 kgs of lint = 1kg of yarn + 0.16 kgs of waste.

d) At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

e) Previously ginning Charges and ginning loss togather were taken at Rs 325 per 40 kgs of lint. Now it has been reported that increase in ginning out turn over time has compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

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

Sources:

1. Cotton Outlook for fob price (various issues).
2. APTMA, Karachi for items, 2, 3 and 9.
3. Annex IX 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 ACTUAL AVERAGE CIF (KARACHI) PRICE OF IMPORTED COTTON DURING 2000-2001 (JULY TO DECEMBER)

S. No	Item	Price calculations (if cotton consumed at Karachi)
		Rupees per 40 kgs
1.	Actual average cif (Karachi) price	3195
2.	Handling charges at port and transport cost from port to textile at Karachi @ Rs 2.5 % of cif price	80
3.	Ex- gin price of lint (item 1+item 2)	3275
4.	Value of 80 kgs of cotton seeds (a)	608
5.	Ginning charges including loss (b)	250
6.	Value of 120 kgs of seed cotton (item 3 +item 4 - item 5)	3633
7.	Seed cotton price per 40 kgs (item 6/ 3)	1211

Note:

a) At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

(b) Previously ginning Charges and ginning loss togather were taken at Rs 325 per 40 kgs of lint. Now it has been reported that increase in ginning out turn over time has compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

Source:

1). FBS, Karachi for cif (Karachi price.
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 NORTH EUROPE PRICE OF ORLEAN/TEXAS MIDDLING 1-1/32" DURING 2000-2001 (SEPTEMBER- JANUARY)

S. No	Item	Price calculations (If cotton consumed at Karachi)
		US cent per pound
1.	Average cif North Europe quotations	61
2.	Freight charges	5
3.	Forwarding charges @ 1.5% cif north europ Quotations	1
4.	Cif (Karachi) price	67
5.	Insurance, agents commission, and port handling charges @ 4% of cif (Karachi) price	3
6.	Landed cost at Karachi	70
		Rupees 40 kgs (b)
7.	Net cif (Karachi) price	3651
8.	Handling charges at port and transport cost from port to textile at Karachi @ 2.5 % of cif price	91
9.	Ex- gin price of lint (item 7+ item 8)	3742
10.	Value of 80 kgs of cotton seeds (b)	608
11.	Ginning charges including loss (c)	250
12.	Value of 120 kgs of seed cotton (item 9 +item 10 - item 11)	4100
13.	Seed cotton price per 40 kgs (item 7/ 3)	1367

Notes:

a). At exchange rate of one US $ = 59.20 Pak Rupees

b). At the average price of Rs 304 per 40 kgs of cotton seed as observed in Multan market during 2000-01(Sept - Jan).

c). Previously ginning Charges and ginning loss togather were taken at Rs 325 per 40 kgs of lint. Now it has been reported that increase in ginning out turn over time has compensated the ginning loss. Thus ginning charges @ Rs. 250 per 40 kgs of lint have been used.

Sources:

1). FBS, Karachi for cif (Karachi price.

2). KCA, for incidentals chrges.

3). Pakistan cotton ginners Association for ginning charges.

ANNEX-XVII

PREMIUM/DISCOUNT RATES FOR VARIOUS GRADES OF SEED COTTON

Grade	Lint technical differentials	Premia/ Discounts (Per cent)
Super	10.70/200	5.4
One	7.13/200	3.6
Two	3.95/200	2.0
Three	Base	Base
Four	4.66/200	2.3
Five	9.25/200	4.6

Source: Pakistan Cotton Standards Institute, Karachi.

ANNEX-XVIII

REQUIREMENT AND SUPPLY OF CERTIFIED COTTON SEED BY THE PUBLIC AND PRIVATE SECTOR: IN PUNJAB 1991-92 TO 2000-01

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
1991-92	11.69	1.19	0.17	0.01	13.06	45.74	28.6
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

Notes:

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

b) The relaxed standard varied from 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-XIX

REQUIREMENT AND SUPPLY OF CERTIFIED COTTON SEED THE PUBLIC AND PRIVATE SECTOR: IN SINDH: 1991-92 TO 2000-01

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
1991-92	0.03	-	0.82	-	0.85	16.43	5.17
1992-93	0.57	-	-	-	0.57	11.92	4.78
1993-94	0.08	-	-	-	0.08	16.65	0.48
1994-95	0.07	-	-	-	0.07	12.17	0.58
1995-96	0.08	-	0.40	1.46	1.94	15.88	12.22
1996-97	-	0.30	-	-	0.30	18.04	1.66
1997-98	0.22	0.38	-	8.37	8.97	18.01	49.81
1998-99	0.05	-	0.05	23.17	23.27	18.91	123.06
1999-00	0.01	-	0.05	0.80	0.86	19.01	4.52
2000-01	-	0.63	-	0.46	1.09	15.71	6.96

Notes:

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

b) The relaxed standard varied from 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-XX

DISTRIBUTION OF COTTON AREA IN THE PUNJAB BY VARIETY DURING 2000-01

Varieties	Year of release	Per cent of area sown as reported by	
		Pest Scouting Directorate	Crop Reporting Service
CIM-446	1998	39.39	34.01
Karishma	1996	11.94	17.01
CIM-443	1998	7.28	8.68
BH-118	2000	5.90	-
CIM-448	1996	3.79	9.61
FVH-53	1998	3.56	3.42
FH-900	2000	2.91	-
CIM-109	1990	2.44	2.60
NIAB-78	1983	1.57	2.87
FH-901	2000	1.52	-
CIM-482	2000	1.50	-
BH-36	1992	1.43	3.75
MNH-554	2000	0.59	-
CIM-240	1992	0.22	3.10
N-98	-	0.03	-
Unapproved varieties	-	15.91	17.96 (others)
Total	-	100.00	100.00

Source: Central Cotton Research Institute, Multan