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**PRICE POLICY FOR SUGARCANE:  
2005-06 CROP**

**AGRICULTURAL PRICES COMMISSION  
GOVERNMENT OF PAKISTAN  
ISLAMABAD**

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## ABBREVIATIONS

AARI	:	Ayub Agricultural Research Institute
AJ&K	:	Azad Jammu & Kashmir
ALMA	:	Agricultural and Livestock Marketing Adviser
APCOM	:	Agricultural Prices Commission
BCR	:	Benefit Cost Ratio
CBR	:	Central Board of Revenue
CIF	:	Cost Insurance and Freight
COP	:	Cost of Production
CPI	:	Consumer Price Index
CPR	:	Cane Procurement Receipt
DPV	:	Duty Paid Value
ECC	:	Economic Co-ordination Committee of the Cabinet
EPB	:	Export Promotion Bureau
FBS	:	Federal Bureau of Statistics
FCA	:	Federal Committee on Agriculture
FOB	:	Free on Board
FYM	:	Farm Yard Manure
GDP	:	Gross Domestic Product
GST	:	General Sales Tax
HYV	:	High Yielding Variety
IPM	:	Integrated Pest Management
ISO	:	International Sugar Organization
LHC	:	Lahore High Court
LSD	:	Light Speed Diesel
MINFAL	:	Ministry of Food, Agriculture and Livestock
NARC	:	National Agricultural Research Center
NAs	:	Northern Areas
NWFP	:	North West Frontier Province
OLS	:	Ordinary Least Squares
PARC	:	Pakistan Agricultural Research Council
PSMA	:	Pakistan Sugar Mills Association
PSST	:	Pakistan Society of Sugar Technologists
TCP	:	Trading Corporation of Pakistan
USDA	:	United States Department of Agriculture
WPI	:	Wholesale Price Index
WAPDA	:	Water and Power Development Authority
WTO	:	World Trade Organization

# **PRICE POLICY FOR SUGARCANE, 2005-06 CROP**

## **EXECUTIVE SUMMARY AND RECOMMENDATIONS**

**S**ugarcane production has decreased from 53.4 million tones in 2003-04 to 47.1 million tones in 2004-05. The sugar mills are facing severe shortage of cane.

Based on the past trend in sugar production in relation to cane, 3124 thousand tones of sugar is likely to be produced during 2004-05. Total availability of sugar during 2004-05 including opening stocks of 809 thousand tones has been estimated at 3933 thousand tones while domestic requirements are estimated at 3707 thousand tones.

Based on the analysis of relevant factors discussed in main text of this Report, likely pricing options for sugarcane, 2005-06 crop are given in the following Table.

## Price Policy Options

S.No	Basis	Likely prices of sugarcane at mill gate		
		Punjab	NWPF	Sindh
		Rupees per 40 Kgs		
1.	Cost of production of sugarcane (Table-7)	45	40	47
2.	Market price realized by growers (2004-05)	40	40	41
3.	Domestic parity prices worked back from :			
	i) Average wholesale price of "gur" during October – December, 2004 (Annex- VII)	51	60	-
	ii) Average wholesale prices of sugar during 2004-05 crushing season (Annex- XIII)	34	34	35
4.	If real value of cane price for 2004-05 crop were to be equated with the level of 1990-91	41	41	42
5.	Import parity prices (economic) as worked back from the average fob (London) price of white sugar (Annex- XIII)			
	i) During 1999-00 to 2003-04	41	41	42
	ii) During October – November, 2004	44	44	45
6.	Export parity price (economic) as worked back from the average fob (London) price of white sugar (Annex- XV)			
	i) During 1999-00 to 2003-04	28	28	29
	ii) During October – November, 2004	31	31	31
7.	Cost of domestic resources (Table – 15) involved in:			
		Rupees per US \$ (At exchange of Rs.60=one US \$)		
	i) Producing cane for sugar import substitution			
	- Based on 2004-05 prices of sugar	43	-	40
	- Based on average prices of sugar 1999-2004	39	-	38
	ii) Producing cane for exports of sugar			
	- Based on 2003-04 prices of sugar	61	-	53
	- Based on average prices of sugar 1999-2004	61	-	56

## RECOMMENDATIONS

### Prices of Sugarcane, 2005-06 Crop

As per results of the analysis of relevant factors, summarized in paras 103 to 112 of this Report, APCOM recommends to maintain existing purchase prices of sugarcane, announced by the provincial governments, for the 2005-06 Crop as well. However, purchase prices for sugarcane, as in other crops, should be determined by the Federal Government.

### Linking Prices of Sugarcane to its Quality

A high powered committee be set up under the Secretary, MINFAL with representatives of the Ministry of Industries, sugar mills, cane growers and other relevant agencies, which should devise the modus operandi of linking prices of sugarcane to its quality.

### Improving Marketing of Sugarcane

- The prices of sugarcane as announced by the Government must be ensured to farmers.
- The role of middleman in sugarcane buying needs to be discouraged.
- The Provincial/District Governments should install their own weighbridges and properly check those installed at mill gates and the purchase centers. The weigh bridges/scales installed by the middlemen at various places should be banned.
- The federal government should take serious notice of the poor response from the district governments to the request of Cane Commissioner Sindh regarding proper use of sugarcane cess.
- Improper cane preparation results in lower sucrose recovery and loss to the mills. A campaign may be started to educate the farmers about proper preparation and stripping the trash from cane before supply to mills.
- In order to minimize excessive deductions and ensure quick payments for cane to growers, the provisions of Sugar Factories Control Act, 1950, need to be strictly enforced by the Provincial Governments.

- The Sugar Factories Control Act, 1950 may be amended in accordance with the current needs.

### **Value-addition in Sugar Industry**

In the wake of increasing globalization and WTO requirements, sugar industry, which in Pakistan primarily relies on manufacturing sugar and has not given much attention to the production of other value added products, would also have to go into the business of value adding. The likely products which can be manufactured from the molasses include alcohol, citric acid, lysine, monosodium glutama, liquid sugar, yeasts, etc. The bagasse can be used in the production of chipboard, paper compressed fiber and even electricity. The Ministry of Industries/Experts Advisory Cell may work out a strategy in this context.

### **Improving Productivity**

#### *Varietal development*

ECC decision on the allocation of cess fund for research should be fully implemented by the provincial governments so as to strengthen the research programme for varietal development which should also be monitored and subjected to peer reviews.

#### *Promoting improved cultural practices*

The Provincial Agriculture Extension Departments should launch educational campaign to apprise the farmers about the :

- proper methods of land preparation for sugarcane cultivation;
- optimum plant population and the methods to achieve this;
- sowing the recommended and improved varieties and discourage the cultivation of unapproved varieties;
- methods and importance of weed control and plant protection;
- importance of the use of balanced doses of various fertilizers based on proper plant/soils analysis and the timings and methods of use of various fertilizers;

- cultural practices and biological control of the pests. The government should stress upon the PSMA to ensure establishment of IPM labs for rearing of predators at each mill's premises; and
- value of press mud as a source of organic matter and promote its use in crop production. The sugar mills be advised to supply mud to the cane growers free of cost instead of selling for non-farm uses.

*Role of Sugar industry in cane development*

To improve the productivity of sugarcane, the sugar industry may be persuaded to take the responsibility of :

- production, multiplication and distribution of certified seed of improved and recommended varieties of sugarcane. For this purpose sugar mills should establish their Cane Development Centres either individually or collectively. These centres in collaboration with the progressive growers and sugarcane researchers should undertake the multiplication and distribution of certified cane seed and also provide technical advisory services to the growers;
- providing facilities of hot water treatment of cane setts to the growers alongwith technical guidance for using the technique; and
- providing incentive in the form of quality premium to the growers growing high sucrose varieties.

**Dr. Muhammad Hanif**  
**Chairman, APCom**

**January , 2005**

# PRICE POLICY FOR SUGARCANE, 2005-06 CROP

## 1. INTRODUCTION

Sugarcane is the fourth largest and second most important cash crop of Pakistan. Cultivated over one million hectares it occupies about 5 percent of the total cropped area. Its share in value added by major crops has ranged between 11-13 percent during the last five years. It also provides valuable by-product (sugarcane tops) as fodder for livestock. Sugar industry - the second largest agro-based industry of Pakistan comprising of more than 70 sugar mills depends on sugarcane farming for raw material. Located mainly in the countryside it provides not only employment opportunities for rural labour but also contributes to rural development through the provision of infrastructure and many other forward and backwards linkages. Moreover, sugarcane farming and sugar industry have significantly contributed to the public exchequer in the form of excise duty and other taxes. However, indiscriminate expansion in the sugar industry particularly towards cotton zone has not only led to uneconomic horizontal expansion in sugarcane cultivation on marginal lands but also posed a serious threat to the country's water resources and forex earnings from cotton crop.

2. For the last few years the sugarcane and sugar sub-sectors have been in turmoil, suffering the problems associated with over supply, surplus stocks of sugar, liquidity problems, and accumulated arrears of growers. The prices of sugar crashed both in the domestic and international markets, adversely affecting the economics of sugarcane and its dependent sectors. The situation, however, has changed during the current year. Decreased cane production resulting in short supplies to the mills and rise in sugar prices in the international market may lead to high prices of sugarcane and sugar in the domestic market. This situation has induced certain state policy measures like import of sugar.

3. The marketing of sugarcane particularly in the beginning of crushing season has been a nightmare for the farmers, involving long waiting at the mills, short weight of the produce at weighing bridge both at the purchase centers as well as in the mills, excessive deductions on

account of trash contents and delayed payments forcing the growers to sell off the produce to the middlemen at throw away prices or selling CPRs at discounted prices.

4. In the global context Pakistan ranks 4<sup>th</sup> in terms of acreage under sugarcane, 5<sup>th</sup> in terms of production and almost at the bottom in terms of per hectare yield. The analysis of economic indicators being discussed in this report suggest that horizontal expansion in cane production is neither desirable nor feasible particularly under sugar exporting scenario. However, there is a considerable scope for increasing cane production through improving the productivity of resources committed to its farming. Similarly there exists a large potential for improving sugar recovery through improvement in the processing efficiency at the mills and cultivation of high sucrose varieties of cane. Efforts are also required to improve the efficiency of resources already committed to produce sugarcane and sugar so that cost of production of this farm enterprise could be reduced.

5. In view of the importance of sugarcane crop and sugar industry in the economy the problems confronting the farmers and industry need to be resolved through policy measures aimed at addressing the core issues of over/short supply of sugarcane, malpractices in its marketing, and disposal of sugar. The Commission has put forward a number of proposals in this context for the consideration of Government in this Report.

## 2. SUGARCANE PLANTING AND HARVESTING SEASONS

6. Sugarcane, a tropical crop requires temperature of more than 20 C<sup>0</sup> for proper germination and growth and two months of dry and cool weather towards maturity. The climatic conditions in Pakistan generally provide a growing season of 8 to 10 months for sugarcane in a year. Recommended times of planting spring and autumn crops of sugarcane by province are given in Table-1.

**Table-1: Planting Times of Sugarcane by Province**

Province	Planting Time	
	Spring Crop	Autumn Crop
Punjab	15th February to 3rd week of March	September
Sindh	1st February to 15th March	September to October
NWFP	15th February to 3rd week of March	September

**Source:** Official correspondence with Sugarcane Coordinator, NARC, Islamabad.

7. The planting time for the Autumn crop depending on the monsoon rains can be advanced to August and may last upto November in some areas. The planting of Spring crop continues upto April.

8. Harvesting of sugarcane generally commences in October and lasts upto April –May depending upon the crop size. In Sindh the crop matures a couple of weeks earlier than in the Punjab and the NWFP.

## 3. PROVINCIAL SHARES IN AREA AND PRODUCTION

9. Area under sugarcane for the three year's average ending 2004-05 is worked out at 1.04 million hectares (2.57 million acres) and production at 50.9 million tonnes (Table-2).

**Table-2 : Provincial Shares in Area and Production of Sugarcane:  
Average of 2002-03 to 2004-05**

Country/Province	Area		Production	
	000 hectares	Per cent	000 tonnes	Per cent
<b>Pakistan</b>	<b>1039.6</b>	<b>100.0</b>	<b>50874.1</b>	<b>100.0</b>
Punjab	689.7	66.3	32771.0	64.4
Sindh	244.5	23.5	13224.4	26.0
NWFP	104.8	10.1	4845.0	9.5
Balochistan	0.6	0.1	33.7	0.1

**Source:** Worked out from data in Annex-I.

10. The average shares of Punjab, Sindh and NWFP are estimated at 66.3, 23.5 and 10.1 per cent in area and 64.4, 26.0 and 9.5 per cent in production of sugarcane. While the share of Balochistan is negligible as it is contributing only 0.1 per cent both in the area and production. The provincial shares are also depicted in figures 1 and 2.

#### 4. IMPORTANT SUGARCANE PRODUCING DISTRICTS

11. Sugarcane is a high water delta crop. It is grown in irrigated conditions. Districts which grow 100 thousand tonnes or more of sugarcane are Faisalabad, Jhang, R.Y.Khan, Sargodha, Kasur, T.T.Singh, M.Garh, M.B.Din, Okara, Bahawalnagar, Vehari, Sheikhpura, Bhakkar, Layyah, Bahawalpur, Pakpattan, Sahiwal, Narowal, Khanewal, Hafizabad, Rajanpur, Khushab, Multan, Mianwali, D.G.Khan and Gujrat in the Punjab; Hyderabad, Badin, Nawabshah, N.Feroze, Thatta, Khairpur, Mirpurkhas, Sanghar, Sukkur, Ghotki and Dadu from Sindh and Mardan, Charsada, Peshawar, D.I.Khan, Naushera, Malakand and Swabi from NWFP. These 43 districts collectively account for 99 per cent of the sugarcane area and production (Annex-II).

12. However Faisalabad, Jhang, R.Y.Khan, Sargodha, Kasur, T.T.Singh, Hyderabad, Badin and Mardan collectively produce 54 per cent of the total sugarcane produced in the country. Out of 77 sugarmills, 33 are located in these districts.

**PROVINCIAL SHARES IN AREA AND PRODUCTION OF SUGARCANE:  
AVERAGE OF 2002-03 TO 2004-05**

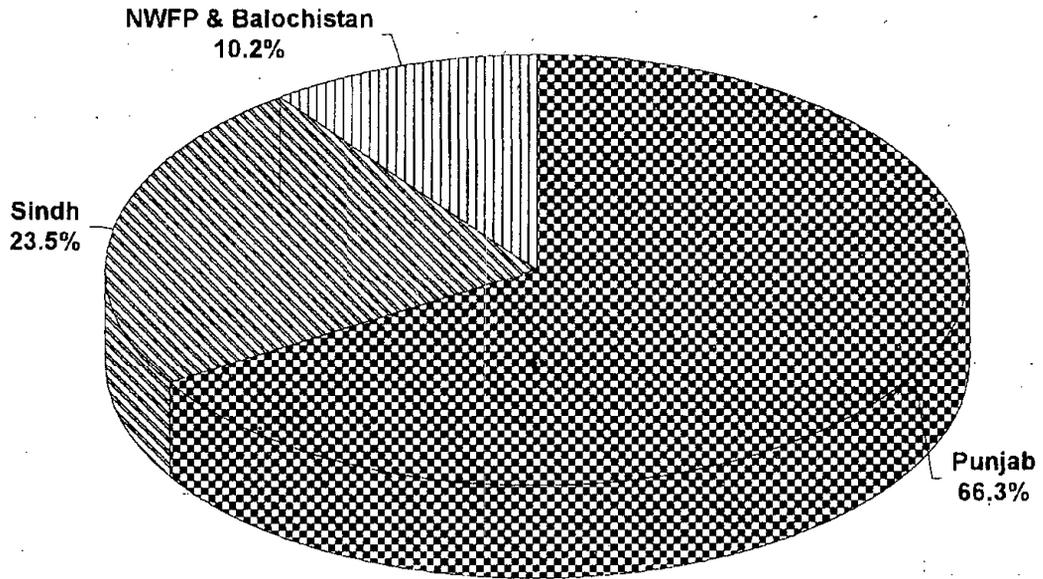


FIG-1: SHARES OF AREA

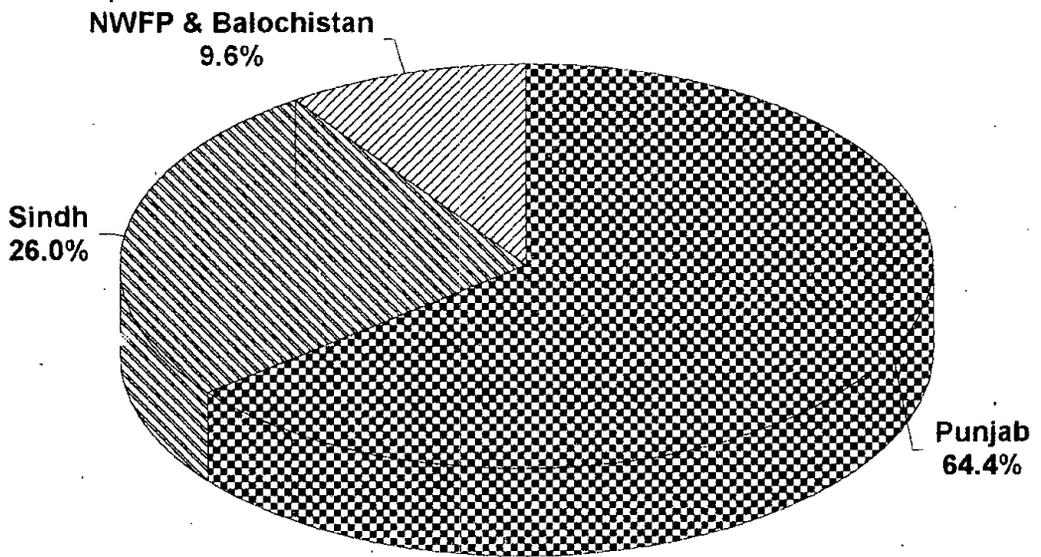


FIG-2: SHARES OF PRODUCTION

## 5. AREA, YIELD AND PRODUCTION

13. During the decade ending 2004-05 area under sugarcane at country level has ranged between 945 to 1156 thousand hectares (2334 to 2857 acres) and the production of sugarcane has ranged between 42 to 55 million tonnes with an average yield of 44 to 50 tonnes per hectare. The changes in the long, medium and short terms are discussed below:

### 5.1 Long-term Changes: 1994-95 to 2004-05

14. During the period under reference sugarcane production at country level is estimated to have increased @ 0.8 per cent per annum based upon increases of 0.2 and 0.6 per cent per year in area and yield (Table-3).

**Table-3: Average Annual Growth Rates of Area, Yield and Production of Sugarcane: 1994-95 to 2004-05**

Country/Province	Area	Yield	Production
	Per cent per annum		
Pakistan	(+) 0.2	(+) 0.6	(+) 0.8
Punjab	(+) 0.6	(+) 1.4	(+) 2.0
Sindh	(-) 0.8	(-) 0.9	(-) 1.6
NWFP	(+) 0.01	(+) 0.4	(+) 0.4

**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-I.

15. In the Punjab sugarcane production has increased @ 2 per cent per year due to 0.6 per cent annual expansion in area and 1.4 per cent improvement in yield.

16. In Sindh sugarcane production has diminished @ 1.6 per cent per year due to 0.8 per cent contraction in area and 0.9 per cent in fall in yield.

17. In NWFP 0.4 per cent increase in production is based upon similar increase in yield.

## 5.2 Medium-term Changes: 1999-00 to 2004-05

18. During the period under reference, at the country level, sugarcane production has increased @ 2.2 per cent per year due to 2 per cent improvement in yield and 0.3 per cent expansion in area (Table-4)

**Table-4: Average annual Growth Rates of Area, Yield and Production of Sugarcane: 1999-00 to 2004-05**

Country/Province	Area	Yield	Production
	Per cent per annum		
Pakistan	(+) 0.3	(+) 2.0	(+) 2.2
Punjab	(+) 0.5	(+) 3.7	(+) 4.3
Sindh	(-) 0.1	(-) 1.1	(-) 1.2
NWFP	(-) 0.2	(-) 0.2	(-) 0.4

**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-I.

19. In the Punjab sugarcane production has increased @ 4.3 per cent per annum based upon 3.7 per cent improvement in yield and 0.5 per cent expansion in area.

20. In Sindh in medium term yields are falling @ 1.1 per cent and area is contracting @ 0.1 per cent per annum as a result, sugarcane production is declining @ 1.2 per cent per annum.

21. In the NWFP sugarcane production has decreased @ 0.4 per cent. Shared equally (i.e. @ 0.2 per cent) decrease in area and yield.

22. Medium term growths in area, yield and production of sugarcane have out paced the long term growths at country level.

23. Water scarce conditions has affected sugarcane yields in Sindh. In the Punjab supplementary tubewell irrigation has over come this deficiency.

### 5.3 Short-term Changes: 2003-04 Vs 2004-05

24. According to the second estimates of the Provincial Agriculture Departments total production of sugarcane from 2004-05 crop is reported at 47.1 million tonnes, 11.7 per cent less than the harvest at 53.4 million tonnes in 2003-04. The decline in production is solely due to 12.1 per cent contraction in area as the yield improved by 0.4 per cent. Area and production of sugarcane has decreased in all the provinces but in varying degrees (Table-5).

**Table-5: Area, Yield and Production of Sugarcane: 2003-04 and 2004-05 Crops**

Country/ Province	Area		Change Per cent	Yield		Change Per cent	Production		Change Per cent
	2003-04	2004-05		2003-04	2004-05		2003-04	2004-05	
	000 hectares			Tonnes per hectare			Million tonnes		
<b>Pakistan</b>	<b>1074.5</b>	<b>944.7</b>	<b>(-) 12.1</b>	<b>49.7</b>	<b>49.9</b>	<b>(+) 0.4</b>	<b>53.4</b>	<b>47.1</b>	<b>(-) 11.7</b>
Punjab	709.0	624.7	(-) 11.9	48.0	49.8	(+) 3.8	34.0	31.1	(-) 8.5
Sindh	259.9	214.9	(-) 17.3	56.2	52.4	(-) 6.8	14.6	11.3	(-) 22.9
NWFP	104.8	104.7	(-) 0.1	45.3	45.3	0.0	4.7	4.7	0.0
Balochistan	0.8	0.4	(-) 50.0	48.3	54.8	(+) 13.5	0.04	0.02	(-) 43.3

Source: Annex-I.

25. Sugarcane production in the Punjab reported at 31.1 million tonnes for 2004-05 is 8.5 per cent less than the harvest of 34 million tonnes in 2003-04. The 3.8 per cent improvement in yield could not neutralize the 11.9 per cent decrease in area.

26. In Sindh sugarcane production of 11.3 million tonnes is 23 per cent less than the 14.6 million tonnes produced last year. Area and yield decreased in Sindh by 17.3 and 6.8 per cent respectively.

27. In the NWFP no significant change in area, yield and production is observed during 2004-05 as compared to 2003-04

28. Provincial Agriculture Departments of Punjab and Sindh have forwarded following factor for changes in area in 2004-05 crop:

1. Lucrative prices of cotton during last year induced the growers to shift sugarcane area to cotton in main sugarcane growing area.
2. Delays in payments of sugarcane growers by the sugar mills discouraged the growers to plant more area under sugarcane.

#### 6. TARGETS VS ACHIEVEMENTS: 2004-05 CROP

29. Federal Committee on Agriculture (FCA) had fixed sugarcane production target at 50.9 million tonnes for 2004-05 crop. According to the second estimate sugarcane production is 47.1 million tonnes 7.3 per cent or 3.8 million tonnes less than the target. Under achievement in production is due to non achievement of area and yield targets by 5.5 and 1.7 per cent (Table-6).

**Table-6: Targets and Estimated Achievements of Area, Yield and Production of Sugarcane: 2004-05 Crop**

Country/ Province	Area		Devia- tion from the target	Yield		Devia- tion from the target	Production		Devia- tion from the target
	Target	Achieve- ment		Target	Achieve- ment		Target	Achieve- ment	
	--- 000 hectares ---		Per cent	Tonnes per hectare		Per cent	-- Million tonnes --		Per cent
<b>Pakistan</b>	<b>1000.0</b>	<b>944.7</b>	<b>(-) 5.5</b>	<b>50.9</b>	<b>49.9</b>	<b>(-) 1.9</b>	<b>50.9</b>	<b>47.1</b>	<b>(-) 7.3</b>
Punjab	650.0	624.7	(-) 3.9	50.4	49.8	(-) 1.2	32.8	31.1	(-) 5.0
Sindh	250.0	214.9	(-) 14.0	52.6	52.4	(-) 0.4	13.1	11.3	(-) 14.3
NWFP	100.0	104.7	(+) 4.7	49.8	45.3	(-) 9.0	5.0	4.7	(+) 4.8
Baloch- istan	0.0	0.4	-	-	54.8	-	0.0	0.02	-

- Sources: 1. For targets: Minutes of the 81<sup>st</sup> Meeting of FCA held on 11-10-2004 at Islamabad.  
2. Achievements: Annex-I.

30. In the Punjab and Sindh targets of area yield and production of sugarcane were not achieved.
31. In the NWFP sugarcane production remain below target by 4.8 percent, although there is an over achievement of area target by 4.7 per cent but the yield level remain below target by 9 percent.

### 6.1 Target For 2005-06 Crop

32. FCA had fixed sugarcane production target for 2004-05 crop at 50.9 million tonnes. Against the target, sugarcane production from 2004-05 crop is reported at 47.1 million tonnes in the second estimates provided by the Provincial Agricultural Departments which is 7.3 per cent less than target and 11.7 per cent less than the production of 2003-04 crop.

33. FCA has not yet fixed the target for 2005-06 crop. Since the target for 2004-05 crop has not been achieved. Therefore, it is proposed that target of 50.9 million tones fixed for 2004-05 crop may be repeated for 2005-06 crop.

34. Agencies concerned for the supply of inputs should gear their efforts in letter and sprit to realize this target.

### 7. FACTORS CONSIDERED FOR PRICE POLICY OPTIONS

35. In formulating the price policy proposals for sugarcane, 2005-06 crop, following factors have been considered and analysed.

- 7.1 Cost of production of sugarcane
- 7.2 Market prices of sugarcane, 2004-05 crop
- 7.3 Nominal and real prices of sugarcane
- 7.4 Economics of fertilizer use on sugarcane
- 7.5 Domestic demand, supply, stocks and prices of sugar
- 7.6 Comparative economics of sugarcane and competing crops
- 7.7 Prices of sugarcane on the basis of 'gur' prices
- 7.8 Prices of sugarcane worked back from average wholesale market price of sugar
- 7.9 World supply, demand, stocks, trade and price situation of sugar
- 7.10 Import and export parity prices
- 7.11 Economic efficiency in sugarcane production

## 7.1 Cost of production of sugarcane

36. Cost of production is an important factor in formulating price proposals for farm produces. Its empirical estimation, however, entails several conceptual problems and practical difficulties because of wide variations in agro-climatic conditions and farm systems under which the crop is raised. In case of sugarcane, the problem is further compounded as fresh and ratoon crops with different duration and husbandry practices are grown. Moreover, the fresh crop is sown at two different periods, i.e. in spring and autumn, resulting in varying crop duration, use of inputs and yield levels.

37. The cost of production estimates of sugarcane for 2005-06 crop have been synthesized by adopting the input/output parameters as used in the support price policy for sugarcane, 2004-05 crop along-with the latest input prices and custom hire rates of field operations. To update the input prices and custom hire rates of different operations involved in raising of sugarcane, APCom conducted a field survey in the major sugarcane growing areas of the Punjab, Sindh and NWFP during October 2004. These rates were also discussed in the meeting of the APCom's Standing Committee on sugarcane, held on 18<sup>th</sup> November 2004 at Multan and supplemented with the information supplied by the committee members. The detailed cost estimates are presented in Annexes III to V, while a summary of the results is presented in Table-7.

**Table-7: Average Farmers' Cost of Production of Sugarcane: 2004-05 and 2005-06 Crops**

Items	Unit	Cost estimates		Increase in 2005-06 over 2004-05
		2004-05 Crop	2005-06 Crop	
<b>Punjab</b>				
1. Cost of cultivation	Rs/acre	20335	22193	1857
2. Yield	Kgs/acre	565.15	565.15	-
3. Cost of production at farm level	Rs/40 kgs	35.98	39.27	3.29
4. Marketing cost	"	5.25	5.75	0.50
5. Cost of production at mill-gate	"	41.23	45.02	3.79
<b>Sindh</b>				
1. Cost of cultivation	Rs/acre	23386	27640	4254
2. Yield	Kgs/acre	676.02	676.02	-
3. Cost of production at farm level	Rs/40 kgs	34.59	40.89	6.29
4. Marketing cost	"	5.32	5.82	0.50
5. Cost of production at mill-gate	"	39.91	46.71	6.80
<b>NWFP</b>				
1. Cost of cultivation	Rs/acre	18915	20307	1392
2. Yield	Kgs/acre	585.46	585.46	-
3. Cost of production at farm level	Rs/40 kgs	32.31	34.69	2.38
4. Marketing cost	"	4.77	5.77	1.00
5. Cost of production at mill-gate	"	37.08	40.46	3.38

Source: Annexes-III to V.

**Punjab**

38. As per details given in Annexes-III to V and summary information in Table-7, the cost of cultivating one acre of sugarcane in the Punjab, during 2005-06 crop season is estimated at Rs 22193, including land rent. Based on average yield of 565.15 maunds (40 kgs) per acre, the cost of production works out at Rs 39.27 per 40 kgs. Added the marketing charges of Rs. 5.75 per 40 kgs, including transport and development cess, the mill gate cost of sugarcane would come to Rs 45.02 per 40 kgs, reflecting an increase of Rs 3.79 (9 per cent) over the corresponding cost of the 2004-05 crop.

**Sindh**

39. The cost of cultivating one acre of sugarcane in Sindh during 2005-06 crop year is likely to be Rs 27640, including land rent. Based on the average yield of 676.02 maunds (40 kgs) per acre, cost of production at farm gate would be Rs 40.89 per 40 kgs. Accounting for the marketing cost of Rs. 5.82 per 40 kgs, inclusive of development cess of Rs. 0.32 the cost of produce at mill-gate would be Rs 46.71 per 40 kgs, exceeding by Rs 6.80 or 17 per cent over the corresponding cost of Rs 39.91 in 2004-05.

**NWFP**

40. The cost of cultivating sugarcane in NWFP in 2005-06 crop year is expected to Rs 20307 per acre, including land rent. Distributing the cost of cultivation over the average yield of 585.4 maunds (40 kgs), farm level cost of production of sugarcane works out to Rs 34.69 per 40 kgs. Adding the marketing expenses of Rs. 5.77 per 40 kgs, inclusive of development cess, the mill-gate cost would come to Rs 40.46 per 40 kgs, representing an increase of Rs 3.38 (9 per cent) over the mill-gate cost of Rs 37.08 in 2004-05.

41. The above increases in the cost of production of sugarcane in all provinces are primarily attributed to increases in the custom hire rates of tractors, cost of supplementary irrigation and transportation an account of rise in the prices of diesel, fertilizers including FYM, land rentals

and labour wage rates. However, downward adjustment in the mark-up on institutional credit from 11 per cent to 8 per cent, used in calculation to estimate the opportunity cost of the working capital has partially offset the impact of raising prices of inputs and custom hire rates of field operations on cost of cultivation of sugarcane.

### Cost of Major Operations

42. The cost of major operations in the total cost of cultivation of sugarcane during 2004-05 and 2005-06 crops in the Punjab, Sindh and NWFP is presented in Table-8 below:

**Table-8: Cost of Major Items of Sugarcane: 2004-05 and 2005-06 Crops**

Major operations	2004-05	2005-06	Changes in
	crop	crop	2005-06 over
	Rs/acre		2004-05
			Per cent
<b>Punjab</b>			
1. Ploughing, Seed and interculture	4396 (22)	4613 (21)	5
2. Plant protection	179 (1)	184 (1)	3
3. Irrigation	2397 (12)	2704 (12)	13
4. Fertilizer including FYM	3160 (15)	3598 (16)	14
5. Land rent	4875 (24)	5417 (24)	11
6. Harvesting and stripping	2797 (14)	3357 (15)	20
7. Others	2531 (12)	2320 (11)	(-) 8
8. Total cost	20335 (100)	22193 (100)	9
<b>Sindh</b>			
1. Ploughing, Seed and interculture	7157 (31)	7774 (28)	9
2. Plant protection	256 (1)	262 (1)	2
3. Irrigation	1228 (5)	1370 (5)	12
4. Fertilizer including FYM	4511 (20)	5029 (18)	11
5. Land rent	3333 (14)	6000 (22)	80
6. Harvesting and stripping	3380 (14)	4056 (15)	20
7. Others	3521 (15)	3149 (11)	(-)11
8. Total cost	23386 (100)	27640 (100)	18
<b>NWFP</b>			
1. Ploughing, Seed and interculture	4869 (26)	5195 (26)	7
2. Plant protection	249 (1)	255 (1)	2
3. Irrigation	1866 (10)	2043 (10)	9
4. Fertilizer including FYM	3232 (17)	3598 (17)	11
5. Land rent	5625 (30)	6250 (31)	11
6. Harvesting and stripping	673 (4)	808 (4)	20
7. Others	2401 (12)	2158 (11)	(-)10
8. Total cost	18915 (100)	20307 (100)	7

- Notes: 1. Others include mark-up, management, land tax, drainage cess and expected escalation in the cost of selected items.  
2. Figures in parenthesis are per cent shares in total cost.

**Punjab**

43. As per summary information in Table-8, land rent is the major constituent of the cost of cultivation of sugarcane for the 2005-06 crop in the Punjab, accounting for 24 per cent. The other important components are: cultural operations, seed and interculture (21 per cent), fertilizers including FYM (16 per cent), harvesting and stripping net of value of tops (15 per cent) and irrigation (12 per cent).

44. The changes in cost of different operations, resulting in an increase of Rs. 1857 (9 per cent) I per acre cost of sugarcane 2005-06 crop over that of 2004-05 are: 20 per cent in harvesting and stripping, 14 per cent in fertilizers including-FYM, 13 per cent in irrigation, 11 per cent in land rent, 5 per cent in cultural operations, seed and inter-culture and 3 per cent in plant protection. However, the above increase in the cost of cultivation has been partially offset by 8 per cent decline in others mainly due to downward adjustment in the mark-up.

**Sindh**

45. During 2005-06 crop year, the major components of the cost of cultivation of sugarcane, in Sindh, are: cultural operations, seed, and interculture (28 per cent), land rent (22 per cent), fertilizers including FYM (18 per cent), harvesting and stripping operations (15 per cent), others (11 per cent), irrigation (5 per cent) and plant protection (1 per cent).

46. The increase of Rs 4254 (18 per cent) per acre in the cost of cultivation of sugarcane in Sindh over last year's corresponding cost is primarily attributed to increase in: land rent (80 per cent), harvesting and stripping (20 per cent), irrigation (12 per cent), fertilizer including FYM (11 per cent), cultural operations, seed and inter-culture (9 per cent) and plant protection (2 per cent) However, the decline in cost of others by 11 per cent has partially offset the impact of increase in the prices of inputs, custom hire rates, wage rates and fertilizers mainly due to downward adjustment of mark-up from 11 per cent to 8 per cent.

**NWFP**

47. The major components of the cost of cultivation of sugarcane in NWFP during 2005-06 crop year are: land rent (31 per cent), cultural operations, seed and inter-culture (26 per cent), fertilizers including FYM (17 per cent), others (11 per cent), irrigation (10 per cent), harvesting and stripping (4 per cent) and plant protection (1 per cent),

48. The cost of cultivating one acre of sugarcane in NWFP during 2005-06 crop year is likely to increase by Rs. 1392 (7 per cent). The operations causing this increase are: harvesting and stripping (20 per cent), fertilizers including FYM and land rent (11 per cent each), irrigation (9 per cent), cultural operations, seed and inter-culture (7 per cent) and plant protection (2 per cent). However, a part of likely increase in cultivation cost would be offset by 9% decreased cost of other including downward adjustment of mark-up on agriculture loan.

**Prices of major farm inputs**

49. The average market prices of the major farm inputs used in the estimation of the cost of production of sugarcane for the 2004-05 and 2005-06 crops and changes therein are given below:

Items	Units	2004-05 crop	2005-06 crop	Per cent change
1. HSD	RS/litre	23.92	26.03	8.82
2. Power tariff	Rs/KWH	2.98	2.98	-
3. DAP	RS/bag	893	1039	16.35
4. Urea	Rs/bag	416	471	13.22
5. Seed	Rs/40 kgs	51.67	51.67	-

## 7.2 Market Prices of Sugarcane

50. The provincial governments have fixed the following purchase prices of sugarcane at the mill gate:

	<u>2004-05</u>	<u>2003-04 crop</u>
	..... <u>Rs per 40 kgs</u> .....	
<b>Punjab</b>	40	40
<b>Sindh</b>	43	41
<b>NWFP</b>	42	42

51. The APCom conducted field visits in the important sugarcane growing areas of the Punjab, Sindh and the NWFP in months of October, November and December 2004. During the course of the field survey, the growers informed the survey teams about the difficulties and the problems encountered by them in selling their sugarcane.

52. The crushing campaign in 2004-05, as in last year has started quite late. Due to this delay in the start of crushing by the mills, there is a great rush of farmers for the supply of sugarcane to the mills. It is a typical buyers market with middlemen having a field day. The middlemen are exploiting the farmers' needs; i) to vacate their lands for next crop, and ii) of cash to meet their production and consumption requirements. The survey teams observed long queues of trucks / trolleys and other vehicles loaded with sugarcane on the road sides waiting for the delivery of their produce. The waiting time at mill gate hovered around 2 to 3 days resulting in weight loss, extra expenditure and a lot of inconvenience. To avoid such a situation, farmers often preferred to sell their produce to the middlemen / private parties who offered prompt payments but at a discount of Rs. 3 to 6 per 40 kgs besides transport charges. There were serious complaints about underweighting of the produce as well. The farmers who sold their produce to the sugarmills were in many cases compelled to sell their CPRs to the middlemen but at a discount of Rs. 2 to 5 per 40 kgs. The prices paid by private parties purchasing sugarcane in Punjab were reported at Rs. 34 - 35 per 40 kgs. and Rs. 35 - 36 in Sindh. The growers alleged that most of the

middlemen were working at behest of the sugar mills. However, with the passage of crushing season it has manifested that supply of cane to sugarmills would not be in abundance and there will be competition among the mills for fetching sugarcane. It has been reported in the press that in southern Sindh and some pockets of the Punjab, a few mills have purchased sugarcane at Rs 45 per 40 kgs or even more than that. On the other hand, the Government has quite recently announced the duty free import of 200,000 tonnes of raw sugar to harness the recent rising trend in the sugar prices. Naturally, this step will also depress prices of sugarcane. Thus, market prices of cane may hover again around the purchase prices fixed by the provincial Governments.

53. The mills in the NWFP were purchasing sugarcane at Rs. 42 per 40 kgs and the payments were reportedly made within fortnight or so. In past years, the sugarmills in NWFP had faced the problem of short cane supplies, mainly due to tendency of gur making at a large scale by the growers. Reportedly, this trend has declined to some extent and the mills in this province are functioning without any problems in cane supplies as yet.

### **7.3 Nominal and Real Prices of Sugarcane at Support and Market Prices: 1990-91 to 2004-05 Crops**

54. To ascertain overtime changes in the purchasing power of sugarcane, its nominal support and market prices at the mill-gate from 1990-91 to 2004-05 were deflated by the Consumer Price Index (CPI), the most widely used measure of inflation in the economy. The results are given in Table-9 and 10 and also shown in figures 3 to 6.

#### **7.3.1 Nominal and real support prices of sugarcane**

55. The nominal and real support prices of sugarcane in the Punjab and Sindh from 1990-91 to 2004-05 are set out in Table-9.

**Table-9: Nominal and Real Support Prices of Sugarcane: 1990-91 to 2004-05**

Crop year	Nominal prices		Consumer price Index(CPI)	Real Prices	
	Punjab	Sindh		Punjab	Sindh
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	15.25	15.75	100.00	15.25	15.75
1991-92	16.75	17.00	110.58	15.15	15.37
1992-93	17.50	17.75	121.45	14.41	14.62
1993-94	18.00	18.25	135.14	13.32	13.50
1994-95	20.50	20.75	152.73	13.42	13.59
1995-96	21.50	21.75	169.21	12.71	12.85
1996-97	24.00	24.50	189.18	12.69	12.95
1997-98	35.00	36.00	203.96	17.16	17.65
1998-99	35.00	36.00	215.66	16.23	16.69
1999-00	35.00	36.00	223.39	15.67	16.12
2000-01	35.00	36.00	233.24	15.01	15.43
2001-02	40.00*	43.00	241.50	16.56	17.81
2002-03	40.00*	43.00*	248.98	16.07	17.27
2003-04	40.00*	41.00*	257.77	15.52	15.91
2004-05	40.00*	43.00*	266.51	15.01	16.13

Source: Economic Survey of Pakistan: 2003-04.

- Notes:
1. CPI for 2004-05 has been projected in view of the average rise in CPI during the last 3 years.
  2. \*Minimum purchase price of sugarcane at mill-gate fixed by the provincial governments.
  3. \*\*Prices of sugarcane actually realized by the growers.

## Punjab

### Support Price

56. It may be seen from Table-9 that the nominal support price of sugarcane in the Punjab during the period of 1990-91 to 2004-05 indicates a cumulative increase of 162 per cent whereas CPI has risen by 167 per cent during the same period reflecting a decline of 2 per cent in the purchasing power of sugarcane 2004-05 crop over 1990-91. However, inter year comparison of real support prices of sugarcane has depicted sharp fluctuations in its purchasing power. It improved in the years for which support price was enhanced by the government but deteriorated during the period the support price was kept unchanged.

**Sindh****Support Price**

57. Table-9 indicates that the nominal support price of sugarcane in Sindh during the period of 1990-91 to 2004-05 has reflected a cumulative increase of 173 per cent. During the same period, the CPI has risen by 167 per cent. Consequently, the real support price of sugarcane in 2004-05 crop year estimated at Rs 16.13 per 40 kgs, in terms of 1990-91 prices, has shown an improvement of 2.41 per cent over the corresponding price in 1990-91. The inter year comparison of real support price of sugarcane has shown more or less a similar pattern as reflected for Punjab.

**7.3.2 Nominal and real market prices of sugarcane****Punjab**

58. The nominal market prices of sugarcane have increased from Rs 15.25 per 40 kgs to Rs 40 during the period under analysis showing an overall rise of 162 per cent (Table-10). During the same period, the CPI has risen by 167 per cent. Consequently, the real value of market price of sugarcane has declined by 2 per cent during the period under analysis.

59. The market prices of sugarcane have shown many ups and downs during the period under review experiencing a sharply rising trend during the period of 1990-91 to 1996-97. Nominal increase of 149 per cent in cane prices against cumulative inflation of 89 per cent during this period led to 32 per cent improvement in the real market price of the crop. In the subsequent years real value of market price of sugarcane declined touching the lowest value of Rs. 13.17 in the year 2003-04. However, the year 2000-01 was the best year for cane growers when market price of their produce rose to Rs. 45 per 40 kgs with its real value at Rs. 29.19. The survey reports regarding current crop of sugarcane are encouraging as cane growers are getting the cane prices at par with 1990-91, reflecting real improvement of 14 per cent over 2003-04 crop year.

**Sindh**

60. The nominal market price of sugarcane realized by the growers has surged from Rs. 15.75 per 40 kgs in 1990-91 to Rs 41 in 2004-05, showing an overall increase of 160 per cent

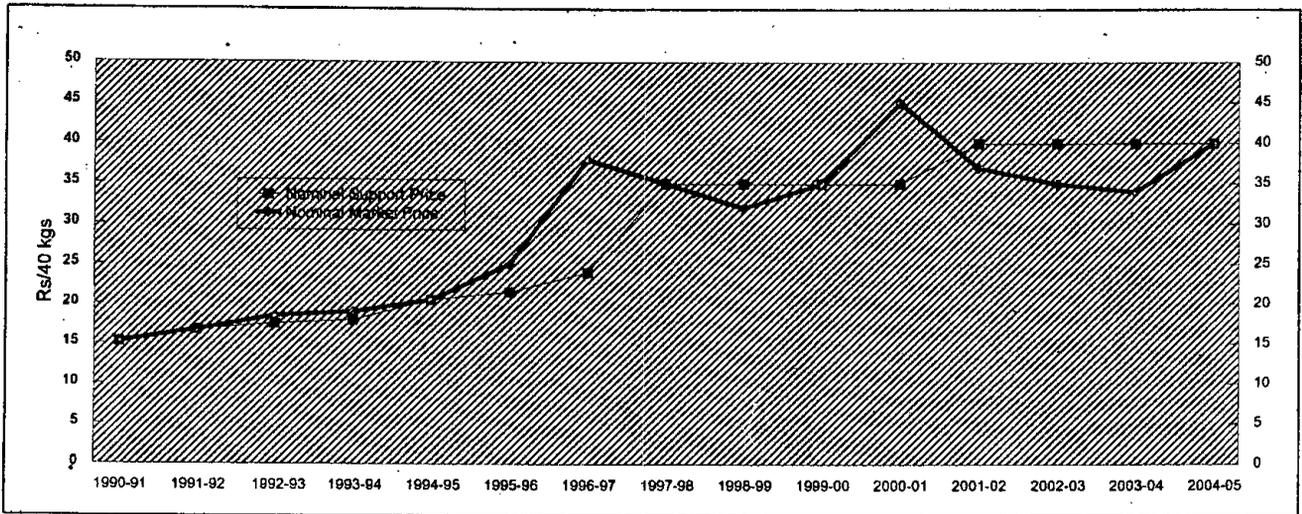


Fig-3: NOMINAL SUPPORT AND MARKET PRICES OF SUGARCANE IN THE PUNJAB: 1990-91 TO 2004-05

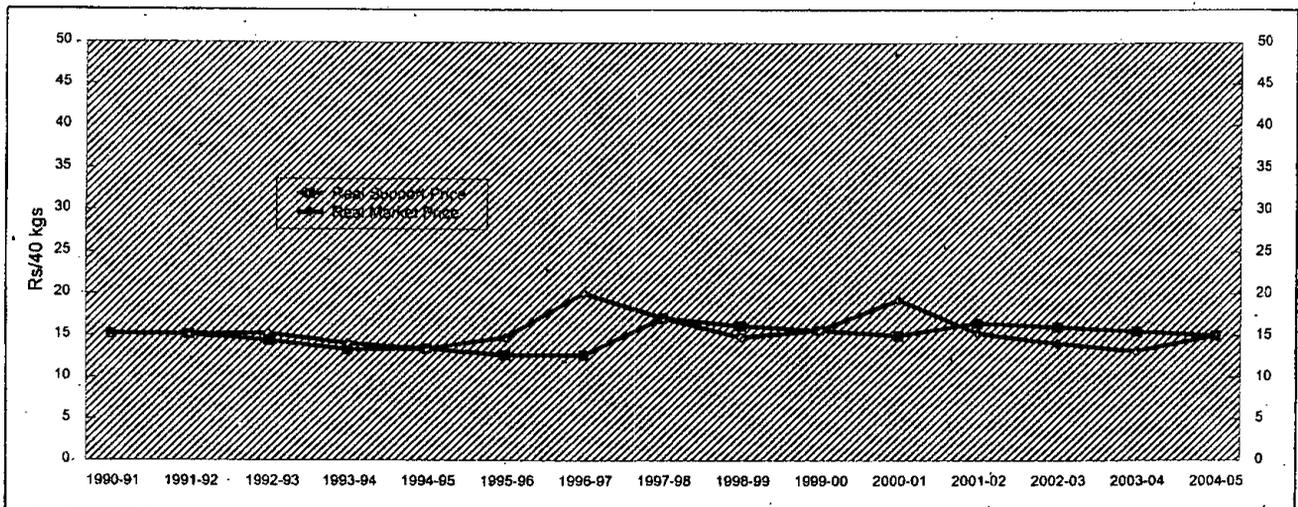


Fig-4: REAL SUPPORT AND MARKET PRICES OF SUGARCANE IN THE PUNJAB: 1990-91 TO 2004-05

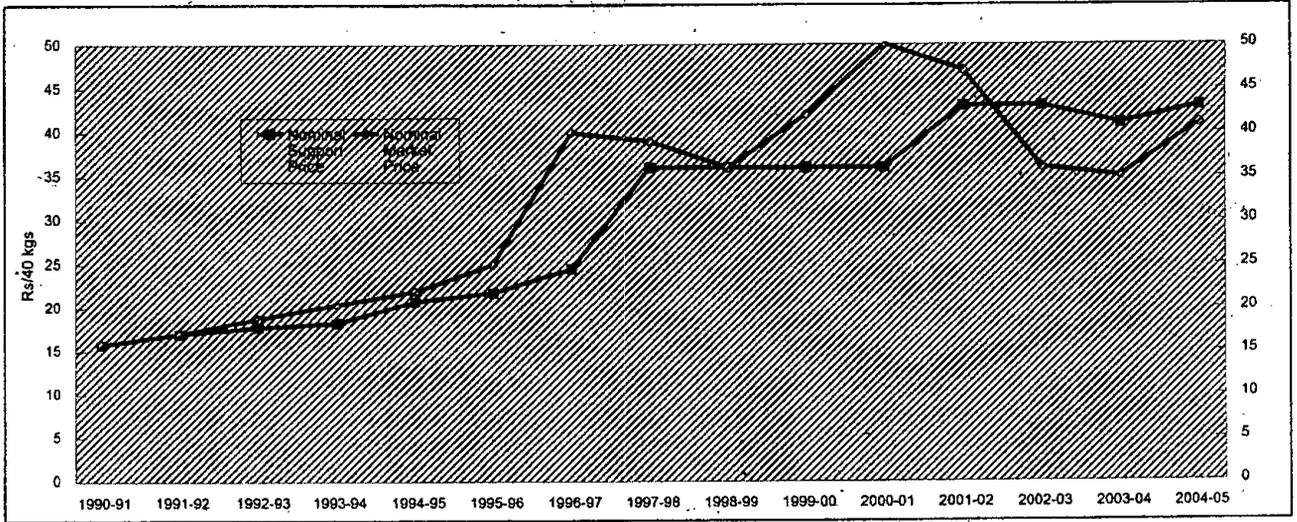


Fig-5: NOMINAL SUPPORT AND MARKET PRICES OF SUGARCANE IN SINDH: 1990-91 TO 2004-05

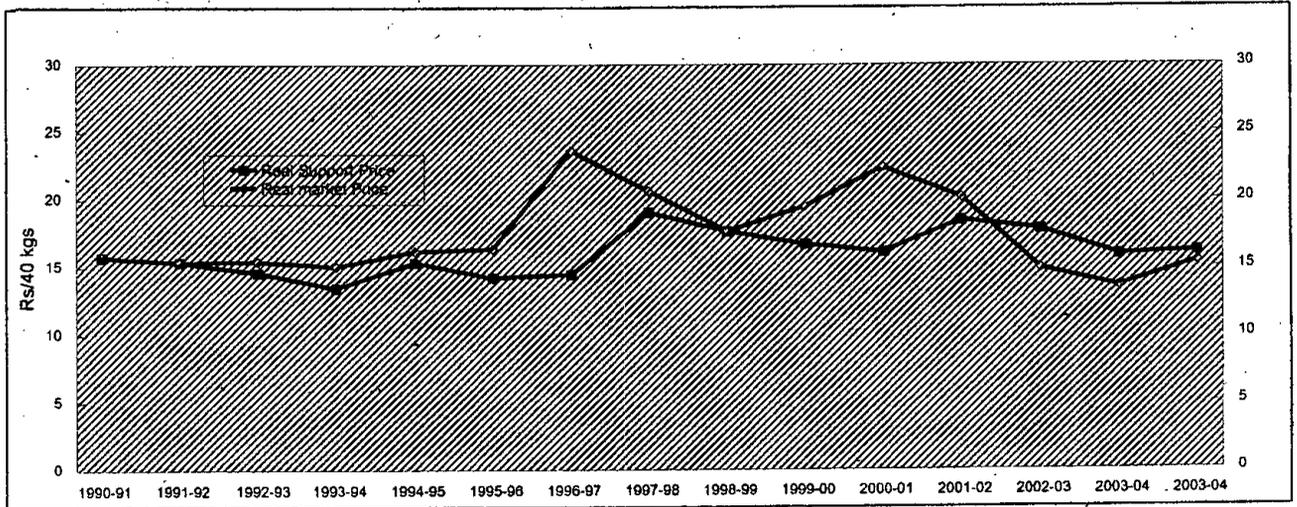


Fig-6: REAL SUPPORT AND MARKET PRICES OF SUGARCANE IN SINDH: 1990-91 TO 2004-05

(Table-10). During the same period, the CPI has increased by 167 per cent. Consequently, the real value of market price of sugarcane has declined from Rs 15.75 in 1990-91 to Rs 15.38 per 40 kgs in 2004-05. The analysis of the data presented in Table-10 further reveals that purchasing power of sugarcane in terms of 1990-91 prices has shown significant improvement during the period from 1996-97 to 2001-02 followed by a decline of 2 to 14 per cent in the subsequent years. Experiencing many ups and downs the real market prices of sugarcane in Sindh province have shown the same pattern as observed in the Punjab. However, magnitude of improvement during 2000-01 and 2001-02 was higher in the former.

**Table-10: Nominal and Real Market Prices of Sugarcane: 1990-91 to 2004-05**

Crop year	Nominal prices		Consumer price Index(CPI)	Real Prices	
	Punjab	Sindh		Punjab	Sindh
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	15.25	15.75	100.00	15.25	15.75
1991-92	16.75	17.00	110.58	15.15	15.37
1992-93	18.50	18.75	121.45	15.23	15.44
1993-94	19.00	20.40	135.45	14.06	15.10
1994-95	20.50	21.90	135.14	13.42	14.34
1995-96	25.00	25.00	152.73	14.77	14.77
1996-97	38.00	40.00	169.21	20.09	21.14
1997-98	35.00	39.00	189.18	17.16	19.12
1998-99	32.00	36.00	203.96	14.84	16.69
1999-00	35.00	42.00	215.66	15.67	18.80
2000-01	45.00	50.00	223.39	19.29	21.44
2001-02	37.00**	47.00	233.24	15.32	19.46
2002-03	35.00**	36.00**	241.50	14.06	14.46
2003-04	34.00**	35.00**	257.77	13.17	13.58
2004-05	40.00**	41.00**	266.51	15.01	15.38

Source: 1. Economic Survey of Pakistan: 2003-04.

2. Various issues of Support Price Policy for Sugarcane Crop.

Notes: 1. CPI for 2004-05 has been projected in view of the average rise in CPI during the last 3 years.

2. \*Minimum purchase price of sugarcane at mill-gate fixed by the provincial governments.

3. \*\*Prices of sugarcane actually realized by the growers.

## 7.4 Economics of Fertilizer Use

61. The economics of fertilizer use in sugarcane farming has been analysed through estimating (i) Benefit Cost Ratio (BCR) of fertilizer use and (ii) parity ratio between the prices of fertilizers and sugarcane. The results are discussed below:

### 7.4.1 Benefit Cost Ratio (BCR)

62. BCR refers to the ratio between value of additional produce resulting from using a certain dose of fertilizers and the costs thereof, both direct and indirect. A BCR of greater than one means that benefits are higher than the costs entailed in the process and vice versa. To encourage fertilizer use under low risk farming conditions (irrigated) a BCR of 2:1 or higher is recommended by agronomists. Because of large variations in soil and climatic conditions across various agro-climatic regions, the crop's response to the use of fertilizer nutrients exhibits considerable variation. Moreover, BCRs are also subject to change due to overtime changing prices of inputs and output. Thus the analysis of fertilizer use on sugarcane has been carried out at different response ratios for the period of 1995-96 to 2004-05.

63. The data presented in Table-11 reveal that BCRs at various response ratios have all along been greater than one implying fertilizer use on sugarcane has remained profitable throughout the period under analysis. However, acceptable profitability level of  $BCR \geq 2$ , as proposed by the experts, has been generally observed at response ratios of 90:1 and 110:1. The highest profitability level, at all response ratios was observed during 1996-97 and 2000-01 crop years when prices of sugarcane realized by the growers rose by 56 and 23 per cent over the previous years respectively. After 2000-01 BCRs at all response ratios have declined sharply reflecting price change unfavourable to crop. The BCR data further show that profitability of fertilizer use on sugarcane in Sindh has been higher as compared to Punjab because of higher prices of sugarcane. The data on BCRs point to the need for improving the profitability of fertilizer use through confining sugarcane cultivation to rich soils and enhancing its productivity by inducing adoption of recommended agronomic practices.

**Table-11:- Benefit Cost Ratios (BCRs) of Fertilizer Use on Sugarcane at the Mill-gate Prices:1995-96 to 2004-05**

Crop year	BCR at Response ratios (Sugarcane: Nutrient) of							
	50:1		70:1		90:1		110:1	
	Punjab	Sindh	Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
1995-96	1.52	1.50	1.86	1.84	2.13	2.10	2.35	2.31
1996-97	1.93	2.00	2.41	2.49	2.79	2.87	3.10	3.19
1997-98	1.46	1.63	1.83	2.03	2.12	2.36	2.36	2.63
1998-99	1.34	1.50	1.67	1.88	1.94	2.18	2.16	2.43
1999-00	1.37	1.65	1.73	2.07	2.02	2.42	2.26	2.71
2000-01	1.80	2.00	2.26	2.51	2.63	2.92	2.93	3.26
2001-02	1.26	1.60	1.58	2.00	1.83	2.32	2.04	2.59
2002-03	1.29	1.25	1.62	1.56	1.88	1.82	2.09	2.03
2003-04	1.08	1.09	1.35	1.37	1.57	1.59	1.76	1.78
2004-05	1.20	1.23	1.50	1.53	1.74	1.77	1.93	1.97

**Note:** Market prices of sugarcane i.e. the prices actually received by the growers at the mill-gate have been used for computing the BCRs for the respective crop years.

#### 7.4.2 Parity between market prices of fertilizers and sugarcane

64. The parity ratios between market prices of fertilizers and sugarcane refer to the quantity of sugarcane needed to purchase a certain quantity of chemical fertilizers. Table-9 presents overtime picture regarding purchasing power of sugarcane in terms of fertilizer nutrients N and P.

65. As per data presented in Table-12 ratio between prices of fertilizers and that of sugarcane having fluctuated between 12.45 to 19.11 for nitrogen and between 18.94 to 31.17 for phosphorus during the decade ending 2004-05. Those ratios were the most favourable to sugarcane in 2000-01 resulted from remunerative prices of the produce. The quantity of sugarcane needed to buy one tonne of nitrogen in 2000-01 stood at 12.45 tonnes and of phosphorus at 18.94 tonnes. Fertilizer prices have since continued to rise while market prices of sugarcane trended downward. Consequently, with the passage of each crop year the quantity of

sugarcane required to buy the same amount of fertilizers has been increasing. At the prevailing market prices of sugarcane and fertilizers in 2004-05 crop season buying one tonne of nitrogen requires selling of 17.95 tonnes of sugarcane while 31.17 tonnes of sugarcane would suffice to purchase one tonne of phosphorus implying that parity has moved against cane crop particularly in the context of P fertilizer. Thus government is required to take certain measures to reduce the prices of fertilizer which may improve both BCR as well as price parity in favour of sugarcane.

**Table-12 : Ratio Between Prices of Fertilizers (Nutrients) and Sugarcane: 1995-96 to 2004-05**

Crop year	Prices of fertilizer nutrients		Average market price of sugarcane	Quantity of sugarcane needed to buy one nutrient tonne of	
	N	P <sub>2</sub> O <sub>5</sub>		N	P <sub>2</sub> O <sub>5</sub>
	Rupees per tonne			Tonnes	
1995-96	10326	13198	625	16.52	21.12
1996-97	13478	19509	975	13.82	20.01
1997-98	15652	18658	925	16.92	20.17
1998-99	15108	18870	850	17.77	22.20
1999-00	15217	24915	962	15.82	25.90
2000-01	14783	22476	1187	12.45	18.94
2001-02	17391	24499	1050	16.56	23.33
2002-03	17040	25420	942	18.09	26.98
2003-04	17830	25690	925	19.28	27.77
2004-05	18170	31540	1012	17.95	31.17

- Notes:**
1. The prices of N and P have been worked out from those of Urea and DAP, which were used in estimating the cost of production of sugarcane in the respective support price policy papers.
  2. The prices of sugarcane i.e. the prices actually received by the growers as collected during the field surveys by APCoM have been used for computing parity ratios for the respective crop years.

## **7.5 Domestic Demand, Supply, Stocks and Prices of Sugar**

### **7.5.1 Domestic demand, supply and stocks**

66. The data on sugar production, trade, consumption and stocks during 1994-95 to 2003-04 are given in Annex-VI. Annual per capita availability/consumption of sugar ranging from 20.71 to 24.91 kgs has averaged at 21.96 kgs during the period. Based on trend forecast of per capita of 23.15 kgs domestic requirement of sugar for the year 2004-05 has been estimated at 3707 thousand tonnes. Against this sugar production from 2004-05 crop of sugarcane estimated by the sugar industry is 3124 thousand tonnes. Adding 809 thousand tonnes of opening stocks, total availability of sugar for 2004-05 comes to 3933 thousand tonnes. Thus 226 thousand tonnes of sugar may be left as end year stock for the next consumption year giving clear signal to the government for future trade policy regarding sugar.

### **7.5.2 Behaviour of sugar prices in domestic market**

67. The monthly average wholesale prices of sugar prevailing in major domestic markets of Lahore, Faisalabad, Karachi, Hyderabad and Peshawar markets during 2003 and 2004 are given in Annex-VII. During 2003, average wholesale price of sugar ranging from Rs 1,700 to Rs 2,150 in various months was Rs. 1869 per 100 kgs. In 2004 the average price of sugar declined to Rs. 1824 per 100 kgs while monthly prices showed wider range i.e. from Rs. 1578 to Rs. 2107 per 100 kgs.

68. To provide meaningful inferences for policy makers a decade long behaviour of sugar prices in various domestic markets has been analysed. As depicted in Annex-VIII sugar prices have shown a cyclical behaviour during the period from 1994-95 to 2004-05 moving from Rs. 1350 per 100 kgs in 1994-95 to Rs. 2478 per 100 kgs in 2000-01 and then to Rs. 1793 in 2003-04. During the current year sugar prices remained depressed in beginning but have risen to Rs. 2212 per 100 kgs in January, 2005. This cyclical behaviour has also been depicted in Figure-7.

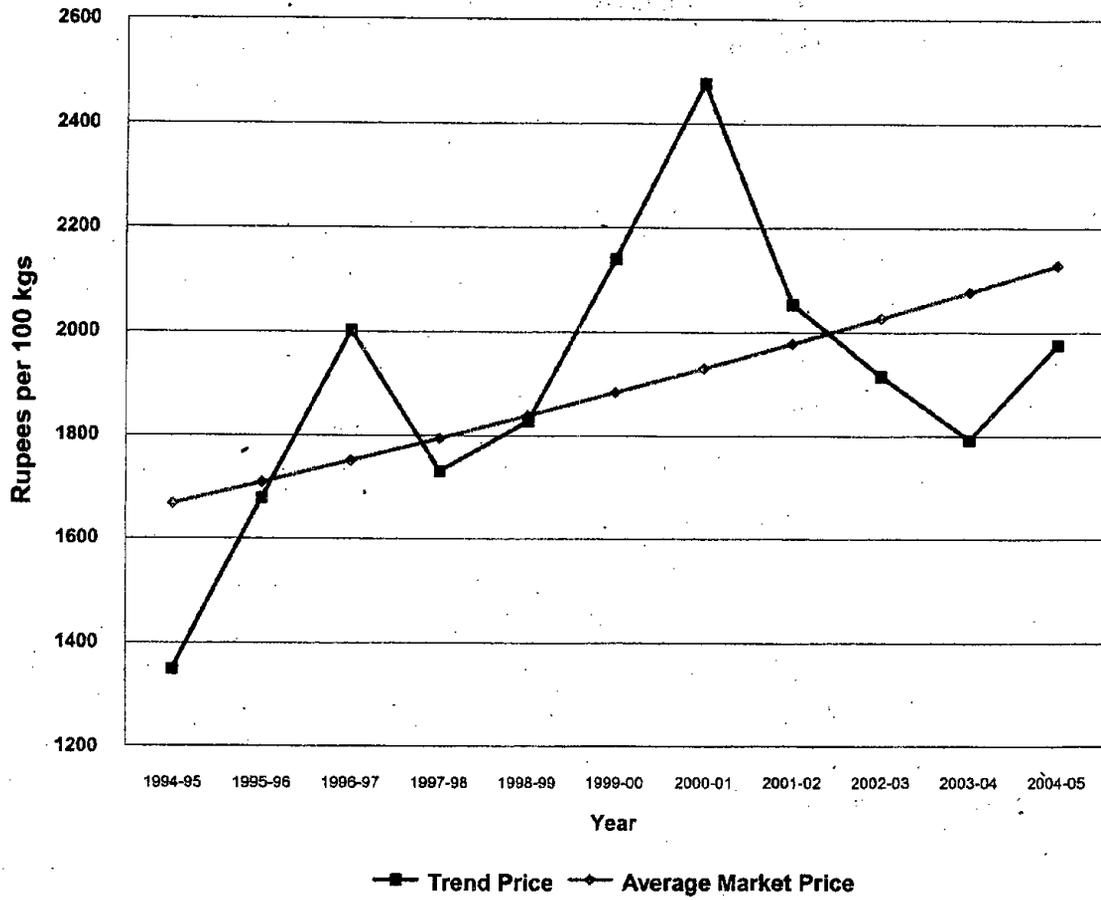


Figure -7: LONG TERM TREND OF WHOLESALE PRICES OF SUGAR: 1994-95 to 2004-05

69. On the basis of monthly average wholesale prices of sugar during 1993-94 through 2003-04 seasonal indices have been calculated and depicted in Figure-8 with the start of crushing season in October/November a downward trend in prices of sugar sets in and continues upto March. Prices trended upward during April with the start of summer season and continue rising upto the start of new crushing season.

### **7.6 Comparative Economics of Sugarcane and Competing Crops**

70. Resource allocation among the competing enterprises is primarily guided by the economic considerations reflected in the gross cost, gross income, gross margin, net income, output-input ratio, etc. Sugarcane is grown in the irrigated regions of the country. Being an annual crop, it competes for land, water and other farm resources with both the kharif and rabi crops as the land planted to sugarcane may not be available for growing other crops in a given year. The economics of sugarcane and competing crops/combinations has been analysed in terms of output-input prices paid and received by the growers during the 2004-05 crop year. The details of the analysis for the Punjab and Sindh are presented in Annex-IX. A summary of various economic indicators is provided in Tables-13 and 14. The results are briefly discussed below:

#### **Punjab**

71. Sugarcane has an advantage over IRRI+wheat and basmati combinations in respect of returns to overall investment, but ranks below IRRI+sunflower and cotton combinations. Sugarcane edges out all the cotton and rice combinations in terms of returns to purchased inputs. However, sugarcane is out-competed by all the competing crop combinations in case of gross revenue per day of crop duration. In view of returns to irrigation water, sugarcane enjoying an edge over rice combinations lags behind cotton rotations.

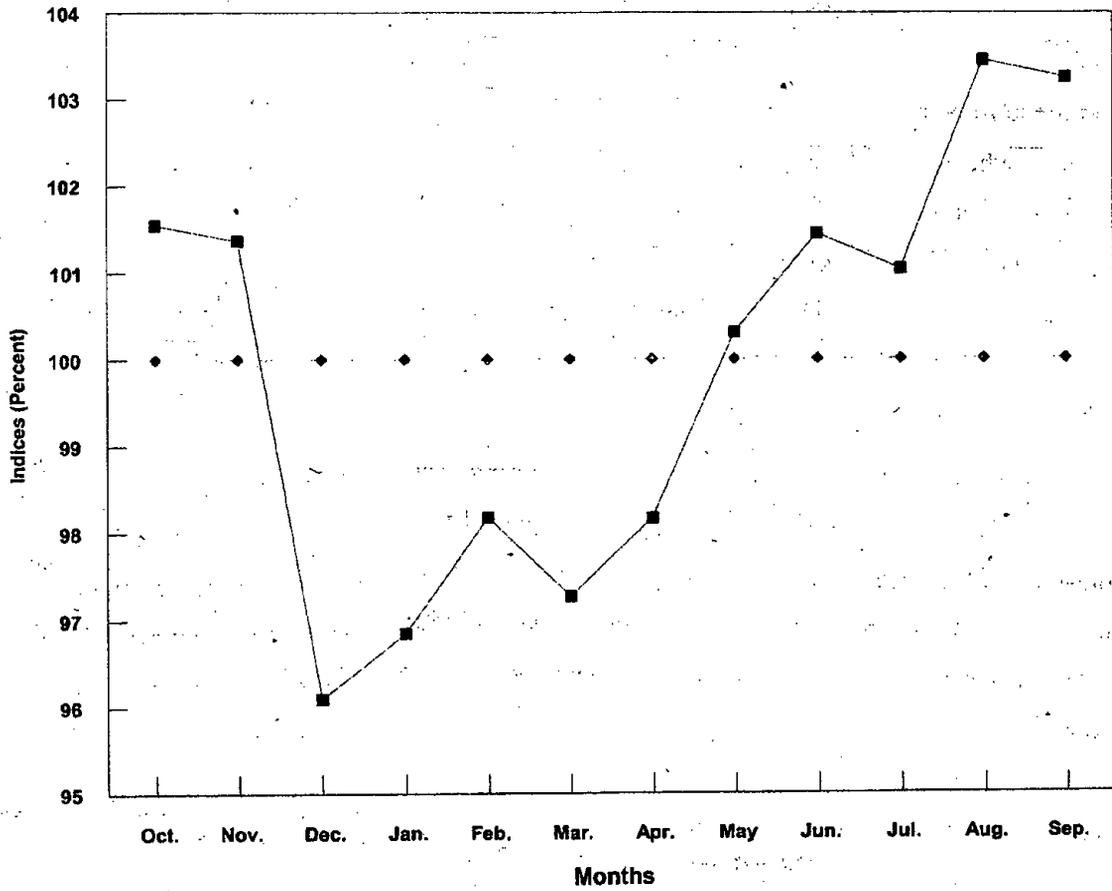


Figure -8: **SEASONAL INDICES OF SUGAR PRICES: 1994-95 TO 2003-04**

**Table-13: Comparative Economics of Sugarcane and Competing Crops at Prices Realized by the Growers in the Punjab: 2004-05 Crops**

Crop/crop combination	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of crop duration	acre-inch of irrigation water used
----- Rupees -----				
1. Sugarcane	0.99	2.90	49.85	409.15
2. Cotton+wheat	1.01	2.24	62.50	673.10
3. Cotton+sunflower	1.11	2.70	66.86	583.50
4. Basmati+wheat	0.88	1.74	54.57	261.92
5. Basmati+sunflower	0.97	2.09	58.85	238.34
6. IRRI+wheat	0.98	1.94	55.75	254.04
7. IRRI+sunflower	1.09	2.40	60.16	232.05

### Sindh

72. Sugarcane is out competed by all the competing crop combinations in respect of gross revenue per day of crop duration. It also lags behind all the competing enterprises in terms of output-input ratio except cotton+wheat rotation. In case of gross revenue per rupee of purchased inputs cost, sugarcane out performs the cotton+wheat and IRRI+wheat rotations but ranks below cotton+sunflower and IRRI+sunflower combinations. In view of gross revenue per unit of irrigation water, sugarcane enjoys an edge over rice combinations but lags far behind the cotton rotations.

**Table-14: Comparative Economics of Sugarcane and Competing Crops at Prices Realized by the Growers in Sindh: 2004-05 Crops**

Crop/crop combination	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of crop duration	acre-inch of irrigation water used
----- Rupees -----				
1. Sugarcane	1.05	2.74	49.43	339.72
2. Cotton+wheat	1.08	2.58	56.03	713.09
3. Cotton+sunflower	1.15	2.97	62.04	595.58
4. IRRI+wheat	1.17	2.71	57.25	290.28
5. IRRI+sunflower	1.26	3.20	64.51	267.96

### 7.6.1 Economics of Sugarcane: Inter Provincial Comparison

73. In respect of gross revenue per rupee of purchased inputs cost, sugarcane excels all the competing enterprises in the Punjab while it performs better than the cotton/rice combinations with wheat but lags behind those with sunflower in Sindh. Sugarcane is out competed by the competing crops in terms of gross returns to crop duration in both the provinces.

74. The returns to overall investment in sugarcane farming in Sindh as compared to those in Punjab, as reflected by output/input ratio are higher primarily due to 20 per cent higher yield. The crop duration in Sindh is 16 months against 13 in the Punjab but the returns per day of crop duration are not much different. In view of its longer duration, the crop in Sindh requires more water and other inputs as indicated in the Table-15. The expenses on the use of fertilizer and other inputs are about 30 per cent higher in Sindh.

75. The higher yield in Sindh resulting from the greater use of these inputs and irrigation water compensates to a certain extent for the additional expenses, but the overall returns to use of purchased inputs falls below in Sindh. In spite of higher crop yield, sugarcane farming in terms of water use efficiency does not offer promising returns in Sindh.

**Table-15: Inputs Use and Crop Yield in Sugarcane Cultivation in Sindh Versus Punjab: 2004-05 Crop**

Item	Unit	Sindh	Punjab	Edge in Sindh over Punjab (Per cent)
- Crop duration	Crop days	488	394	(+) 24
- Irrigation water	Acre-inches	71	48	(+) 48
- Inputs use (purchased)	Rs/acre	8800	6778	(+) 30
- Fertilizer Use:	Nutrient Kgs/acre			
N	"	104	56	(+) 86
P	"	39	34	(+) 15
- Crop yield	40 kg units	676	565	(+) 20

### 7.7 Prices of Sugarcane on the Basis of "Gur" Prices

76. Gur making is an important cottage industry for processing of sugarcane into gur in some sugarcane producing areas of NWFP and Punjab. The working of this industry is influenced by the prices of gur, prices of cane offered by the mills and the problems faced by the growers in delivering cane to the mills. Thus, there is a need to compare the economics of supplying cane to the mills with the profitability of gur making. For this purpose, prices of cane have been worked out from the wholesale prices of gur. Details are given below:

#### NWFP

77. In the NWFP, the average wholesale market prices of gur during (October-December) 2004-05 crushing season, averaged at Rs 740 per 40 kgs. After accounting for various expenses involved in gur making i.e. processing, marketing and chemicals used in the process, net value of 400 kgs of sugarcane required to produce 40 kgs of gur assuming recovery of 10 per cent comes to Rs 538. Since the economics of making is being compared with the cane supply to mill, development cess and transport cost of cane from the farm to the mill will also need to be added to this price. These costs are estimated at Rs 5.77 per 40 kgs. Adding these costs mill gate price of sugarcane calculates to Rs 59.57 per 40 kgs (Annex-X).

#### Punjab

78. The wholesale price of gur received by the growers in the Punjab during crushing season 2004-05 (October-December), averaged at Rs 660 per 40 kgs. Accounting for the expenses involved in processing of sugarcane into gur including the cost of chemicals used in the process and in the marketing of gur net value of 400 kgs of sugarcane used in making 40 kgs of gur comes to Rs 455 or Rs 45.50 per 40 kgs. Adding Rs 5.75 as transportation charges and development cess, mill gate price of sugarcane calculates to Rs 51.25 per 40 kgs (Annex-X).

### 7.8 Price of Sugarcane Worked Back from Average Wholesale Market Price of Sugar

79. The prices of sugarcane, the principal raw material for producing sugar in Pakistan, has a direct bearing on sugar price, which in turn affects the demand for sugarcane as well.

Accordingly, price of sugarcane can also be worked back from the average wholesale market price of sugar. Wholesale, market price of sugar in different markets during current season (November-December) 2004-05 has averaged at Rs 19,180 per tonne or Rs 19.18 per kg. After taking into account the wholesalers margin @ 5 per cent or Rs 799 per tonne and sales tax @ 15 per cent or Rs 2398 per tonne, net receipts to the sugar mills calculates to Rs 15983 per tonne. Ratio between the value of raw material (sugarcane) and processing cost has been estimated at 66:34. At this ratio processing cost comes to Rs 5434 per tonne. Using provincial bench mark recoveries of 8.50 per cent for Punjab and NWFP and 8.70 per cent for Sindh, mill gate prices of sugarcane in the Punjab and NWFP work to Rs 35.87 and Rs 36.71 per 40 kgs in Sindh. Details may be seen in Annex-XI.

## 7.9 World Supply, Demand, Stocks, Trade and Price Situation of Sugar

### 7.9.1 Supply, demand, stocks and trade

80. The data on world balance sheet of sugar (raw equivalent), for the period of 2002-03 to 2004-05 are presented in Table-16:

**Table-16: World Balance Sheet of Sugar (Raw Equivalent): 2002-03 to 2004-05 (Oct-Sept)**

S.No	Item	2002-03	2003-04 (Estimated)	2004-2005 (Forecast)	Changes in 2004-05 over 2003-04
----- Million tonnes -----					Per cent
1.	Opening stocks	58.42	65.90	63.98	(-) 2.91
2.	Production	148.32	143.78	146.08	(+) 1.60
3.	Total supply (1+2)	206.74	209.68	210.06	(+) 0.18
4.	Disappearance (consumption)	140.82	144.86	147.89	(+) 2.09
5.	Stock Adjustment *	(-) 0.02	(-) 0.84	(-) 0.77	(-) 8.33
6.	Ending stocks (3-4+5)	65.90	63.98	61.40	(-) 4.03
7.	Trade (export)	43.62	41.61	43.64	(+) 4.88
8.	Trade (import)	43.61	40.76	42.88	(-) 5.20

Note: \* Including adjustment for unknown net trade.

Source: Sugar: International sugar organization, Quarterly Review, November 2004.

81. World sugar production during 2003-04 is estimated at 143.78 million tonnes, 4.54 million tonnes ( 3.60 per cent ) lower than an all time record production of 148.32 during 2002-03. Accounting for opening stocks of 65.90 million tonnes, global supply of sugar in 2003-04 was reported at 209.68 million tonnes, up by 2.94 million tonnes (1.42 per cent) over the corresponding supply of 206.74 million tonnes in 2002-03.

82. The world consumption reported at 144.86 million tonnes in 2003-04 is 4.04 million tonnes (2.87 per cent) higher than that of previous year. End year stocks in 2003-04 are estimated at 63.98 million tonnes

83. International Sugar Organisation has forecast global production of sugar in 2004-05 at 146.08 million tonnes, and consumption at 147.89 million tonnes. End year stocks are projected at 61.40 million tonnes.

#### **7.9.2 International Prices of Sugar**

84. The international prices of raw (fob Caribbean ports) and white (fob London) sugars from 1994-95 to 2004-05 are presented in Annex-XII. The movements in these prices during the period are depicted in Figure-9.

85. The prices of both raw and white sugar have been fluctuating during the period under review. During 1994-95, the prices of raw sugar averaging at US \$ 302.47 per tonne had declined to \$ 146.20 by 1998-99. During the next two years, prices recovered and averaged at \$ 205.91 per tonne in 2000-01, but declined to \$ 151.01 in the next year. During 2002-03 the prices staged some recovery and averaged at \$ 179.03 per tonne but decreased sharply in next year and averaged at 144.79 per tonne . However, during 2004-05 (October - November 2004) prices have been increasing and averaged at \$ 183.09 per tonne in during

86. The prices of white sugar during the period under reference have followed a pattern similar to those of raw sugar and increased from \$ 223.93 per tonne in 2003-04 to \$ 247.81 in 2004-05 (October -November).

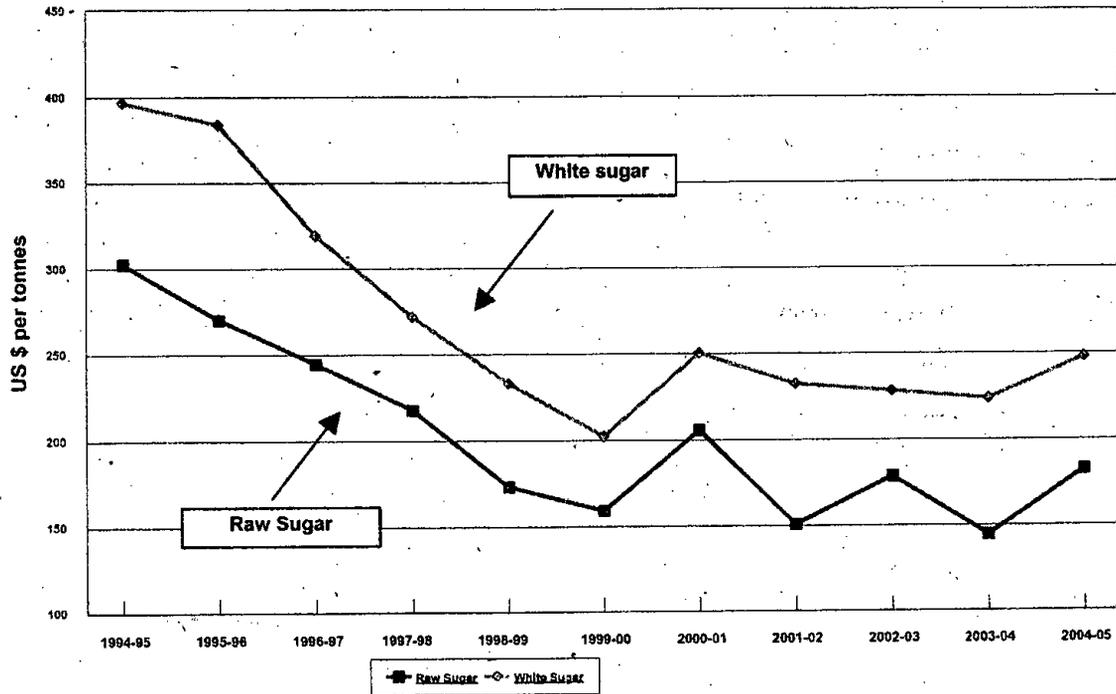


FIG-9 INTERNATIONAL PRICES OF SUGAR: 1994-95 TO 2004-05

87. The differential between prices of raw and white sugar has ranged between \$ 44 and \$ 114 per tonne i.e. 18 to 35 per cent of the white sugar price.

### 7.10 Import and Export Parity Prices:

88. Estimation of the import parity prices of a commodity is helpful in determining the opportunity cost of resources used in its domestic production while export parity prices are helpful in ascertaining its competitiveness in international market. Since Pakistan has been importer in some years and exporters in the others, both the import and export parity prices of sugarcane have been worked out for analyzing price policy options for the next crop season.

89. Both the import and export parity prices have been calculated on the basis of white sugar price (fob London). However, financial and economic analysis has been carried out for working out import parity price, while calculations of export parity price are based on economic analysis only. Inter-bank exchange rate selling for import parity and buying for export parity prices has been used in the calculations. Detailed calculations in this connection are given at Annexes-XIII to XV while results are summarized in Table-17.

**Table-17: Import/Export Parity Prices of Sugarcane as Worked Back from Average fob (London) Prices of Sugar**

Period	Base price	Mill-gate prices of sugarcane in			
		Punjab and NWFP		Sindh	
		Economic price	Financial price	Economic price	Financial price
		US \$/tonne ----- Rs per 40 kgs -----			
<b>Import Parity Prices</b>					
1. During 1999-00 to 2003-04	227.49	40.84	53.76	41.80	55.03
2. During 2004-05 (Oct-Nov)	247.81	43.71	57.64	44.74	59.00
<b>Export Parity Prices</b>					
1. During 1999-00 to 2003-04	227.49	28.06	-	28.72	-
2. During 2004-05 (Oct-Nov)	247.81	30.72	-	31.44	-

Source: Annexes-XIII to XV

## 7.11 Economic Efficiency in Sugarcane Production

90. The economic efficiency in sugarcane production has been evaluated by estimating the most commodity used economic parameters viz Nominal Protection Coefficient (NPC), effective Protection Coefficient (EPC), and Domestic Resource Cost Coefficient (DRC), through constructing Policy Analysis Matrix (PAM). These parameters have been estimated under situation of both imports and exports of sugar, and are based on the cost of production of sugarcane data as used in APCom's Sugarcane Policy Papers. To ascertain the impact of overtime changes in input-output prices, the analysis has been carried out for the 1999-00 to 2004-05 crops. Moreover, to capture regional variations in the resource use efficiency. The said parameters have been calculated for major cane growing provinces of Punjab and Sindh. Numerics of these coefficients are summarized in Table-18 while details of estimation (Policy Analysis Matrix) are given in Annexes-XVI and XVIII.

### 7.11.1 Nominal Protection Coefficient (NPC),

91. The NPCs estimated under sugar importing scenario for Punjab have been less than one during the entire period under analysis except in 2000-01 when it rose to 1.08. The NPCs less than one imply that cane growers of Punjab have generally received prices less than the corresponding import parity prices. Accordingly cane growers of this province were implicitly taxed. However, magnitude of tax has ranged from 1-12 per cent resulting into an average tax of 5 per cent (NPC=0.95) during the period from 1999-00 to 2004-05.

92. The NPCs estimated under exporting situation have ranged from 1.33 to 1.99 implying that the prices realized by the growers have been much higher than the corresponding export parity/economic prices. This further reflects that sugarcane cultivation for exporting sugar is not an economic proposition.

93. The NPCs estimated for Sindh suggest that prices of sugarcane received by the growers have been much higher than the import parity prices during the period of 1999-00 to 2001-02. However, during 2002-03 growers received 11 per cent less than the corresponding import parity price. In the crushing season of 2003-04 prices received by the growers are at par with the

import parity price. The NPC of 0.95 estimated for the current season reflects an implicit tax of 5 per cent on cane growers of Sindh province.

94. The estimation of the NPCs under exporting scenario reveals that like the cane growers of Punjab, growers in Sindh have received prices much higher than those warranted by the export parity prices of sugarcane implying that sugarcane cultivation is the most uneconomic proposition for exporting sugar. The overall situation suggests that production of sugar be restrained at domestic consumption level.

#### 7.11.2 Effective Protection Coefficient (EPC)

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

96. The analysis of the EPCs estimated for the Punjab under importing country scenario reveals that except in 2000-01 the EPCs have been less than one during the period under study implying that cane growers were implicitly taxed ranging from 3-18 per cent, through input-output pricing policies. However, in case of EPCs estimated using export parity prices of sugarcane in output pricing reveal a different picture altogether, i.e. of positive support to sugarcane ranging from 20-108 per cent.

97. The EPCs estimated for Sindh (Table-18) reveal that under importing scenario the sugarcane farming enjoyed support during the period from 1999-00 to 2001-02. However, during 2002-03 and 2004-05 EPCs reflect implicit taxation on sugarcane cultivation ranging from 7-10 percent.

**Table-18: Economic Efficiency Coefficients for Sugarcane: 1999-00 to 2004-05**

Province/Year	Based on					
	Import Parity Prices			Export Parity Prices		
	NPCs	EPCs	DRCs	NPCs	EPCs	DRCs
<b>PUNJAB</b>						
1999-00	0.99	0.97	0.62	1.54	1.59	0.97
2000-01	1.08	1.07	0.51	1.55	1.59	0.71
2001-02	0.93	0.86	0.66	1.38	1.35	1.00
2002-03	0.88	0.81	0.71	1.33	1.28	1.08
2003-04	0.89	0.80	0.81	1.99	2.08	1.57
2004-05	0.92	0.85	0.72	1.35	1.35	1.02
Average (from 1999-00 to 2004-05)	0.95	0.90	0.67	1.50	1.51	1.02
<b>SINDH</b>						
1999-00	1.18	1.21	0.61	1.82	1.93	0.93
2000-01	1.18	1.20	0.50	1.69	1.74	0.70
2001-02	1.18	1.17	0.59	1.75	1.65	0.80
2002-03	0.89	0.80	0.65	1.33	1.28	0.99
2003-04	1.00	0.93	0.88	1.66	1.65	1.42
2004-05	0.95	0.88	0.66	1.35	1.39	0.89
Average (from 1999-00 to 2004-05)	1.07	1.04	0.64	1.59	1.62	0.93

98. The EPCs estimated under exporting scenario are much higher than one for the entire period implying support ranging from 28 to 93 per cent to sugarcane related sectors. The policy option emerged from the analysis would be to discourage sugarcane cultivation and maintain the domestic production marginally below the self-sufficiency level.

### 7.11.3 Domestic Resource Cost Coefficient (DRC)

99. The DRC indicates the opportunity cost of domestic resources used per unit of the value added (at social prices) in the production of a commodity. The numerator in these calculations is the opportunity cost of non-tradable factors used in domestic production while denominator is the value addition calculated at social prices. DRC coefficient of greater than one indicates a "comparative disadvantage" in domestic production as the cost associated with its domestic production is greater than the economic cost of corresponding imports. A situation where

domestic resource cost coefficient is less than one implies "comparative advantage" in domestic production as it can save/generate foreign exchange at costs less than the corresponding cost of imports. It may however be pointed out that DRCs are sensitive to the changes in the opportunity cost of non tradable inputs as well as the border prices of outputs and inputs.

100. The DRCs for sugarcane crop estimated at import parity prices are less than one, both in the Punjab and Sindh. Thus, cane production in both the provinces is efficient in terms of its domestic resource cost. The inter - provincial comparison of the DRCs suggest that Sindh has marginally higher comparative advantage than Punjab.

101. No doubt, the results are sensitive to the changes in the prices of inputs including water, and of output as indicated by the rising domestic resource cost coefficient, overtime. Nevertheless, the estimates of domestic resource cost coefficients, under importing situation do not support the commonly held perception of comparative disadvantage in sugarcane cultivation in Pakistan.

102. Under exporting scenario the DRCs of sugarcane production in the Punjab though still less than one during 1999-2000 and 2001-2002, were however much higher than the corresponding coefficients estimated at import parity prices. As a result of the developments in the inputs and output markets, both domestic and international, during 2002-03 and 2004-05, DRCs have become greater than one. Thus, sugar export is not a viable proposition at the prevailing input - output relationships and the prices thereof. In case of Sindh DRCs which even under exporting scenario were less than one upto the year 2002-03 exceed one in 2003-04 and 2004-05, reflecting comparative disadvantage in exports of sugar in these years.

### 7.12 To sum up

103. The likely pricing options for sugarcane, 2005-06 crop emerging from foregoing analysis of relevant factors are summarized in Table-19, followed by a brief discussion on the subject.

**Table-19: Price Policy Options for Sugarcane: 2005-06 Crop**

S.No	Basis	Likely prices of sugarcane at mill gate		
		Punjab	NWPF	Sindh
<b>Rupees per 40 Kgs</b>				
1.	Cost of production of sugarcane (Table-7 )	45	40	47
2.	Market price realized by growers (2004-05)	40	40	41
3.	Domestic parity prices worked back from:			
	i) Average wholesale price of "gur" during October-December, 2004 (Annex-VII)	51	60	-
	ii) Average wholesale prices of sugar during 2004-05 crushing season (Annex-XIII)	34	34	35
4.	If real value of cane price for 2004-05 crop were to be equated with the level of 1990-91	41	41	42
5.	Import parity prices (economic) as worked back from the average fob (London) price of white sugar (Annex- XIII):			
	i) During 1999-00 to 2003-04	41	41	42
	ii) During October – November, 2004	44	44	45
6.	Export parity price (economic) as worked back from the average fob (London) price of white sugar (Annex- XV)			
	i) During 1999-00 to 2003-04	28	28	29
	ii) During October – November, 2004	31	31	31
7.	Cost of domestic resources (Table – 15 ) involved in	<b>Rupees per US \$ (At exchange of Rs.60=one US \$)</b>		
	i) Producing cane for sugar import substitution			
	- Based on 2004-05 prices of sugar	43	-	40
	- Based on average prices of sugar 1999-2004	39	-	38
	ii) Producing cane for exports of sugar			
	- Based on 2003-04 prices of sugar	61	-	53
	- Based on average prices of sugar 1999-2004	61	-	56

104. The mill gate Cost of Production (COP) of sugarcane for the 2005-2006 crop at prevailing inputs' prices is estimated at Rs 45 per 40 kg in the Punjab, Rs 40 in the NWFP and Rs 47 in Sindh. These costs are respectively higher by 9.19, 9.12 and 17 per cent than the corresponding costs in 2004-2005. The market prices of sugarcane paid to the growers in the beginning of current crushing season were reported at Rs 40 per 40 kgs in the Punjab and NWFP and Rs 41 in Sindh which do not cover even the COP. However, as the crushing progressed market prices of sugarcane might have improved.

105. Based on the average wholesale prices of 'gur' during the current crushing season (October-December 2003) mill gate prices of sugarcane are estimated at Rs. 51 per 40 kgs in the Punjab and Rs. 60 in NWFP. The prices of sugarcane worked back from the wholesale prices of sugar in the domestic market come to Rs. 34 per 40 kgs in the Punjab and NWFP and Rs. 35 in Sindh.

106. Under sugar importing scenario the economic prices of sugarcane (import parity) come to Rs. 44 - 45 per 40 kgs when estimated from fob (London) price of sugar during October - November, 2004. However, when estimated from the last 5 years average price of white sugar, the parity prices of sugarcane come to Rs 41 - 42 per 40 kgs.

107. Under sugar exporting situation the economic prices of sugarcane (export parity) as calculated from the above mentioned short and medium term fob (London) prices of white sugar come to Rs. 31 and Rs. 28-29 per 40 kgs respectively.

108. The domestic resource cost of one US dollar's worth of sugar exports, at the current price through sugarcane cultivation, is estimated at Rs 53 to 61. However, for import substitution, costs of the domestic resources used in sugarcane production work out to Rs 40 - 43 per one US dollar against its current exchange rate of Rs 60.

109. The analysis of time series data on sugarcane area and production exhibits expansion/contraction phase spanning over a period of two years before changing into the next mode. This is primarily in view of the wide spread practice of ratooning. Area under the 2004-05 crop in response to the low prices of sugarcane for last year and better prospects of competing

crops has reduced by 12 per cent in the Punjab and 17 per cent in Sindh, accounting for 90 per cent of the sugarcane area in the country.

110. In view of the foregoing situation, the pricing policy in the context of sugarcane should aim at consolidating the gains and restricting the sugarcane cultivation to the most suitable lands/regions. Given the current input-output relationship and the international prices, there is not much leeway for increasing the price of sugarcane. In the given situation of : (i) low market prices of sugar and sugarcane, (ii) poor prospects for exports of sugar, (iii) recurring water shortages and high water requirements of sugarcane, the over-riding consideration of the government pricing policy should be to send the correct signal to farmers of reducing area under the crop but improving crop yield through judicious use of inputs and improved crop husbandry. The farmers also need to be protected against the rampant mal-practices in the marketing of sugarcane such as purchases of CPRs at discount prices by the middlemen, underweighment, delayed payments by the sugar mills etc. The purchases of CPR's at discount prices by the middlemen, under-weighment of sugarcane must be dealt with sternly to curb these mal-practices and end exploitation of farmers.

111. In the context of paying better prices to the growers addressing the problems faced by the sugar industry such as the availability of cash credit, disposal of surplus stocks, if any and regulating the imports have assumed critical import. The Cost Accounts Organization or the Ministry of Industries should estimate the ex-mill cost price of sugar keeping in view the cost of sugarcane, processing cost, sucrose recovery etc. The imports of sugar should be so regulated as to ensure the ex-mill price of sugar worked out by the M/o Industries to the sugar mills. The problems of liquidity faced by the industry also need to be addressed.

112. There is also scope for providing relief in the cost of purchased farm inputs through the adjustments of sales taxes and other levies which the Government should seriously consider. However, the current policy of fixing the prices of cane by the provincial governments in view of the difficulties faced by the growers as well as the industry needs to be reconsidered and the prices of sugarcane be determined by the federal government. The prices once announced after due consideration of relevant factors should be ensured to the growers.

## 8. LINKING PRICES OF SUGARCANE TO ITS QUALITY

113. Presently cane price in Pakistan is paid on weight basis, without the consideration of its quality. The sucrose contents of the cane variety do not have much to say in price fixation. A few mills in the past had started paying quality premium at the end of season, depending upon the seasonal recovery of cane which discontinued due to filing of cases against it in the courts of law by the mills. Farmers were not encouraged/provided incentives to grow varieties of high sucrose contents, as for them weight was the only consideration. This situation has not only discouraged the farmers but also created inefficiency at mill level, thus increasing the cost of sugar production. In order to improve the situation APCoM had suggested a number of measures in its previous year price policies, but due to certain limitations these recommendations were not implemented. So APCoM stressed in sugarcane price policy for 2004-05, that if government decides to link sugarcane price to its quality (sucrose contents) the APCoM can provide a working paper on the subject for further action in this respect. This recommendation is reiterated to be implemented during 2005-06 crop season.

## 9. MARKETING OF SUGARCANE

114. Sugarcane is one of the main cash crops of Pakistan and is sown on vast areas throughout the country. As it cannot be stored after harvesting, so is to be processed either into gur/khandsari at the farms or crushed by sugarmills for sugar manufacture. So its marketing plays an important role in this respect. For having an upto date information in this respect APCoM conducted a mini survey in the main sugarcane producing areas. On the basis of survey results and discussion in the Standing Committee meeting at Multan held on 18-11-2004, the main issues/problems faced by the farming community are discussed below:

### 9.1 Underweighment

115. It has been noticed and reported by farmers that there was underweighment of cane at the purchase centers and mills gates. The private purchase centers and the mills agents are very notorious in this respect. The weighbridges and scales installed at the purchase centers do not

record the correct weighment. Mostly the farmers bringing cane remained unaware about the readings of these scales. The quantity underweighed varied from place to place and for each mill area. The underweighment was reported upto 10 – 15 per cent of cane weight or about 40 – 50 maunds per trolley load of 450 maunds. In order to check the underweighment at weighbridges, the supervisory committees should be quite effective. Moreover, the use of private/temporary bridges may be banned and district governments should install their own weighbridges at the purchasing points.

### **9.2 Undue deductions**

116. The sugarmills are making deductions on the plea that poor quality cane with high trash contents is being supplied by the farmers. In some places these deductions go upto 10 per cent. For improving the situation, the growers should be educated for properly cleaning the trash before supply to mills, and the Provincial Cane Commissioners should check against such high undue deductions.

### **9.3 Delayed payments**

117. In the beginning of the season, the payments are generally made within two weeks but as the season progresses to the end, the payments are delayed by months and in some cases by seasons. The mills are of the view that this happens due to liquidity problem. Thus, there is a need to impose penalties on late payments as laid down in the Sugar Factories Control Act and also to enhance the liquidity of the sugarmills by lifting sugar at a certain pre-determined price by the public sector.

### **9.4 Presence of middlemen**

118. The importance of middleman in sugarcane marketing cannot be denied as it facilitates the marketing transactions between buyers and sellers. But in case the middlemen delay the supply of cane to mills, it will harm the sugar manufacturing process by making reductions in the

sugar recovery. Therefore, in such cases the role of middlemen needs to be eliminated by putting restrictions on their involvement through the use of administration/legal laws.

### **9.5 The purchase of CPRs**

119. Since growers are in need of immediate payments for their sale proceeds, they in order to avoid the delayed payments are compelled to sell their CPRs at discount rates varying from area to area, but mostly ranging between Rs 2 – 5 per 40 kgs of cane price. This practice had caused tremendous loss to the farming sector. It is, therefore, stressed that this practice of selling CPRs at discount rates may be discontinued or stopped altogether. In order to improve the situation, the mills may be compelled to make the payments for sale proceeds at the earliest, so that need for selling CPRs may be minimized.

### **9.6 Use of sugarcane cess fund**

120. The sugarcane cess fund is to be utilized for the construction and improvement of roads in the sugarmills areas. It can also be utilized for research and development of sugarcane crop. Huge amounts of sugarcane cess fund are lying unutilized with the district/provincial governments, due to lack of proper coordination, planning and decision making. The Provincial Cane Commissioners are mainly responsible for regulating the affairs relating to development, marketing and processing of sugarcane in their respective provinces. While preparing the Support Price Policy Report for Sugarcane 2004-05 Crop, the APCom had requested the Provincial Cane Commissioners to furnish information regarding collection and utilization of sugarcane cess fund. Subsequently, the Sugarcane Commissioner, MINFAL also emphasized them in December 2003 for supplying the required information to the APCom. The Cane Commissioner Sindh had asked the relevant data from the District Coordination Officers of various districts. Throughout the whole one year, he has sent them 14 reminders but all in vain. It is not less than pity that District Coordination Officers have not bothered to respond, despite the fact that a copy of every reminder was also sent for information to the Secretary, Agriculture Department, Government of Sindh (Annex-XVIII). This state of affairs calls for strict disciplinary action by the provincial and federal governments. Moreover, it is also recommended

that unutilized amounts of sugarcane cess fund may be used for the improvement of roads and for research purposes.

### **9.7 Amendments in Sugar Factories Control Act, 1950**

121. After de-zoning many changes have occurred in the cane marketing system and the functioning of Sugar Factories Control Act, 1950 has become less effective. Keeping in view the current needs, it is essential that the Act may be amended accordingly, especially for the promotion of contract system between growers & the mills and the removal of provisions regarding prohibition of gur making and zoning etc.

## **10. VALUE-ADDITION AND VERTICAL INTEGRATION IN SUGAR INDUSTRY**

122. In view of the falling trend in the world prices of sugar and large-scale investments in the domestic sugar industry it is imperative to improve the efficiency of resource use in sugarcane production and its processing. For improving productivity in sugarcane cultivation a number of steps have been discussed in this Report. For improving the productivity in sugar processing the requirement is not only to improve the efficiency but also value addition through vertical integration. It is understood that sugar has become a by-product in many of sugar producing countries as the revenue accruing from the sale of other products manufactured from the molasses and bagasse have out paced the revenue from the sale of sugar. In the wake of fast approaching globalization and WTO requirements the sugar industry of Pakistan which relies on sugar manufacturing only and has not paid much attention to the production of other value added products, would also have to go into value adding business. The likely products which can be manufactured from the molasses include alcohol, citric acid, lysine, monosodium glutama, liquid sugar, yeasts etc. While bagasse can be used in the production of chipboard, paper compressed fiber and even electricity.

## **11. IMPROVING PRODUCTIVITY**

123. The raw material requirement of sugar industry comprising 75 - 78 sugar mills, with crushing capacity of about 350 thousand tonnes per day has been met through expanding acreage under sugarcane. This demand-led horizontal expansion in cane production has not only resulted

in extension of sugarcane cultivation to marginal areas but also aggravated the water shortage. Sugarcane a high water delta crop poses serious competition to other important crops: cotton, rice, wheat, etc. Thus, further expansion in sugarcane area already spanning over one million hectares, given the recurring water shortages and the increasing demand for water from other crops and non farm uses is no more a viable option. With the increasing requirements of other food and cash crops to meet the ever expanding demand from burgeoning population, it is of utmost importance to increase the productivity of resource use in agriculture through all the possible means.

124. On the basis of available evidence, there exists a vast scope for the improvement in yield of cane and its sucrose contents through improved crop management as well as its processing. Pakistan at present does not compare favourably on both these counts with other cane producing countries. In terms of average cane yield Pakistan ranks 15 in the world. The progressive cane farmers in Pakistan usually harvest around 40 tonnes of sugarcane per acre while the average farmers do not go beyond 20 - 25 tonnes. The potential of existing cane varieties under optimal conditions of inputs use is 50 tonnes or so. Australia obtains 5 tonnes of sugar per acre against 1.7 tonnes of Pakistan. A number of factors/constraints have been identified by the Commission in this context in consultation with the crop experts and farmers. Accordingly, the APCom in its Support Price Policy for 2002-03 and 2003-04 crops of sugarcane emphasized on increasing productivity and for that purpose suggested various measures. However, as these measures were not reflected in the MINFAL's summary, these are reiterated for favour of consideration.

### **11.1 Varietal Development**

125. The development of new varieties of sugarcane is a lengthy process requiring primarily the sugarcane fuzzi either through its local production or imports from abroad. The poor infrastructural support for breeding work and climatic conditions in the country except in few areas have not permitted the former. Moreover, the cane breeding programme has been quite limited and confined to a few centers. The programme is also constrained due to insufficient funds and land resources.

126. Considering the financial constraints of Sugarcane Research Institutes, the Sugar Board in its 39<sup>th</sup> meeting held on 17<sup>th</sup> August 1992 decided that provincial governments should set aside 5 per cent of the cess fund for research and development of sugarcane. Since then ECC of the Cabinet in its annual meetings for sugarcane has been directing the provincial governments for the implementation of the above decision but except release of a few lacs of rupees by the government of NWFP allocation of cess fund for cane research development has been confined to paper work. Therefore, APCom emphasizes the implementation of the decisions about the allocation of cess fund. It is also suggested that the research stations concerned with varietal development should be strengthened and their research programmes monitored and reviewed periodically through peer review.

### 11.2 Land Preparation

127. Sugarcane is generally cultivated after cotton and rice. Being deep rooted crop deep ploughing followed by disc/harrow is necessary to provide better conditions for proper development of root system. The field surveys conducted by APCom on sugarcane have shown that only 30-40 per cent of the cane growers have adopted this practice. A large number of farmers are even not aware of the importance of the use of deep tillage implements in land preparation. High cost of the operation/non-availability of needed equipment on custom hire rates are also a major constraint. The Agriculture Extension Departments need to launch educational campaigns to apprise the farmers about the proper methods of land preparation for sugarcane cultivation.

### 11.3 Provision of Seed of Approved Varieties

128. The researchers/breeders have developed a number of high yielding varieties of sugarcane for early, mid and late seasons, which if adopted may help increase the cane yield by 20-25 per cent. However, their adoption is predicated on the availability of their disease free seed. According to the information obtained from Sugarcane Research Centres, high yielding cane varieties recommended for Punjab include: SPF-213, SPF-234, COJ-84, BF-162, CP-43-33, CP-77-400, CP-72-2086, CPF-237 and HSF-240. Yield potential of these varieties realized at research farms ranges from 80 to 100 tonnes per hectare with sugar recovery from 10-12.5 per

cent. CO-1148 is an Indian variety and not recommended for cultivation. Its cultivation though on the decline but still occupies about 25 per cent of area under sugarcane 2004-05 crop.

129. For Sindh BL-4 ,PR-1000 and BF-129 are the recommended varieties. Like CO-1148 in Punjab, a disco variety is being cultivated in Sindh but it has low sugar content and is not approved for cultivation. The recommended varieties for NWFP are: CP-72-2086, CP-77-400, Mardan-92, and Mardan-93. All these varieties if cultivated according to their recommended seasons, may give cane yield of 900-1000 maunds per acre and sucrose recovery of more than 10 per cent.

130. Farmers generally use their commercial crop as seed without its treatment against fungal diseases because no institutional arrangements are available for the production, multiplication and distribution of quality seed of high yielding varieties. In the wake of dezoning, sugar mills are also reported to have stopped their cane development activities including the supply of improved seed to the growers. The APCom suggests the following measures:

- i) Provincial Agriculture Departments should launch an aggressive campaign for educating the growers regarding the sowing of improved varieties and discouraging the cultivation of unapproved varieties.
- ii) The sugar industry should provide incentive to the growers for growing cane of high sucrose varieties in the form of quality premium.
- iii) The responsibility of production, multiplication and distribution of certified seed of sugarcane be assigned to the sugar mills, as they are the main beneficiaries of increased production of sugarcane. For this purpose sugar mills should establish their Cane Development Centres either individually or collectively. These centres in collaboration with the progressive growers and sugarcane researchers should undertake the multiplication and distribution of certified cane seed.
- iv) The sugarmills should provide the facilities of hot water treatment of cane setts to the growers alongwith technical guidance for using the technique.
- v) The Cane Development Centres of the sugar mills should also function as regular institution for extending technical advisory services to sugarcane growers in co-operation with the provincial agricultural research and extension departments.

#### 11.4. Low Plant Population

131. Lack of adequate plant population remains an important factor in low productivity of sugarcane. The research on sugarcane has found that even good quality seed does not provide more than 60 per cent germination implying that quantity of seed should be so adjusted to get optimum crop stand and in turn optimum crop yield. In general 80-100 maunds seed of thin and 100-120 maunds of thick varieties of cane is recommended for cultivating one acre. Nevertheless to ensure 100 per cent germination this quantity of seed must be enhanced through following double sett sowing method recommended by experts. The seed setts should possess two buds and be put in furrows by joining their ends and may be covered with 2-3 inches thick layer of soil. It is also suggested that the seed should be used from fresh crop of 6-8 months old. In order to ensure a good crop stand gap filling should be practiced and seed nurseries be developed for this purpose. The task seems to be of advisory nature and growers have to be persuaded for adopting recommendations on the subject.

#### 11.5 Balanced Use of Fertilizers

132. Chemical fertilizers play an important role in enhancing crop productivity but real key for getting maximum returns from the investment on fertilizers is their balanced and timely application. Overtime, though fertilizer use has increased but due to widening of NP ratio productivity gains have been sub-optimal. The survey reports on use of fertilizers have shown that only a small fraction of cane growers have adopted balanced use of fertilizers. This imbalance in nutrient application adversely affects the per hectare yield of sugarcane as well as quality of the produce.

133. The empirical research has proved that nitrogenous fertilizers stimulate vegetative growth, phosphatic fertilizers help nourishing of roots and strengthening of plants and potassic fertilizers improve/enhance the recovery of sugar and create resistance against drought and some diseases. Experiments have further shown that an average production of 1000 maunds of cane from an acre removes 72 kgs of N, 36 kgs of P and 136 kgs of K from the soil. Keeping in view the fertilizer efficiency and to keep the soil fertility intact, double of the above quantity of fertilizers needs to be applied. However, this also depends on the nutrients already available in

the soil. Our soils though not deficient in potash but need some application of this nutrient for improving the efficiency of other fertilizers. The current use of 3 kgs of potash per acre on the average is too low to provide good results. The judicious and balanced use of NP & K fertilizers is imperative for improving the productivity of sugarcane and its sucrose contents.

134. Although research on fertilizer use in the country is much ahead of other research areas, yet growers are seldom aware of the recommendations/conclusions in this context. Timely availability of required fertilizers, provision of technical guidance regarding proper mix of various brands of fertilizers, determining optimum nutrient requirement based on soil analysis and management of scarce water resources are seen as lacking factors affecting the efficiency of fertilizers used. The provincial governments should launch campaigns to educate the growers about the importance of the use of balanced doses of various fertilizers based on proper plant/soil analysis and the timings and methods of use of various fertilizers.

#### **11.6 Use of Press Mud/organic Matter**

135. As a result of intensive cropping most of our lands/soils have become deficient in organic matter and in turn possess poor texture. This phenomenon has affected output-input response causing economic losses. Organic matter of these soils can be improved/compensated through adding composts, FYM and adopting green manuring practices but intensive cropping does not allow this. Press mud is a waste and by product of sugar industry containing 2 per cent of N, 4 per cent of  $P_2O_5$  and 1 per cent of  $K_2O$ . Presently, the press mud is used as fuel in brick kilns which is a dual loss to the society, firstly through destroying useful nutrients and secondly through causing pollution in the atmosphere. The provincial governments need to discourage burning of press mud as fuel and promoting its use as organic matter/manure in crop production. The sugar mills should supply press mud to the cane growers free of cost instead of selling for non-farm uses. Apparently it may not appeal to the sugarmills. However, if press mud is properly applied to sugarcane fields increased production of cane in turn will yield higher economic returns to the sugarmills.

## **11.7 Plant Protection**

### **11.7.1 Weed control**

136. During the early stages of sugarcane growth weeds compete with the plants for nutrients available in the soil and thus causing a significant loss in cane yields. The empirical research has found that proper inter-culture and hoeing after 60-80 days of crop sowing effectively in eradicating the weeds. However, high cost of labour beside its shortage results in ineffective control of weeds. Use of weedicides to eradicate weeds is therefore strongly advised.

### **11.7.2 Control of diseases**

137. Sugarcane is attacked by a number of diseases. These diseases greatly influence cane yields and sucrose recovery. The most prevalent diseases are red rot, wilt, whip smut, mosaic, and ratoon stunting. Some of these diseases are difficult to identify by farmers, but their attacks cause considerable reduction in yield. Most of the diseases are seed borne. To guard against seed and soil borne diseases the seed treatment with fungicides is necessary. Hot water treatment of seed against diseases like red rot has also been found beneficial and needs to be popularised. However, this facility can not be provided to the growers at their farms. Only sugar mills can be affective in this context. Earthing up of the sugarcane crop after two months of sprouting serves as preventive measures against borer attack and lodging. Moreover, this practice checks tillering at late stages of crop development preventing uneven crop stand and promote uniform maturity. The Provincial agriculture departments should launch an educational campaign for the growers and the sugar mills on the subject.

### **11.7.3 Biological control of sugarcane pests**

138. Sugarcane crop is attacked by borers, termites, pyrilla, bugs etc which cause 10-35 per cent loss in production and 0.25 to 1.25 per cent in sucrose recovery. Generally chemical control measures are recommended for protecting the crop from the above mentioned pests/insects. The experience and research have shown that use of chemicals also kill many predators and natural

enemies of these pests. Moreover, when plants have grown in size and length severe attack of pests can not be controlled through the use of chemicals as manual/mechanical spraying of the crops is not possible. Alternatively granular pesticides do offer the solution but are costly and also not effective in controlling stem, top and "gurdaspuri" borers. Some traditional measures like burning of trash are also applied but this practice destroys the eggs and larvae of some useful pests and encourages population of harmful pests, sometimes to beyond economic injury level. Thus practice of "spray and kill" and burning of trash needs to be replaced by Integrated Pest Management (IPM) technology based on the use of cultural methods and biological measures to control sugarcane pests and diseases.

139. The concept of biological control is based on the fact that each insect/pest has a complement of parasites, predators and diseases that are part of that pest's co-evolved natural checks and balances. Among these commonly known parasites/predators are *Epi-pyropes* for sugarcane pyrilla and *cotesia flavipes* and *trichograma* for sugarcane borers. The identification of species of *trichograma* and other parasites/predators for controlling sugarcane pests is no doubt a good achievement of research but exploitation of real benefits of this technology needs artificial rearing of parasites/predators of sugarcane pests on commercial scale and their adoption by the growers. The public sector institutions do not have sufficient resources for this task, Therefore, sugar mills, also being the direct beneficiaries of increased production and improved quality of the produce, need to spearhead the cause of IPM. Some sugar mills have already established their system of rearing predators and distributing these to the growers at nominal prices. It has been reported that in the areas of those sugar mills which distributed the cards containing eggs of artificially reared parasites/predators attack of pest has reduced. This practice should be adopted by other sugar mills also. The government should stress upon the PSMA to ensure establishment of IPM labs for rearing of predators at each mill. The provincial agriculture department can also play a vital role in educating the growers about various cultural practices in controlling the pests and in the distribution and adoption of biological control techniques.

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## AREA, YIELD AND PRODUCTION OF SUGARCANE: 1994-95 TO 2004-05

YEARS	PUNJAB	SINDH	NWFP	BALUCHISTAN	PAKISTAN
<b>AREA</b>					
<b>000 HECTARES</b>					
1994-95	656.7	249.7	102.1	0.5	1009.0
1995-96	605.6	254.4	102.5	0.6	963.1
1996-97	604.2	251.2	108.4	0.7	964.5
1997-98	685.3	261.6	108.6	0.7	1056.2
1998-99	780.3	270.8	103.3	0.7	1155.1
1999-00	672.1	230.6	106.3	0.8	1009.8
2000-01	615.5	238.8	105.9	0.6	960.8
2001-02	656.8	240.7	101.5	0.7	999.7
2002-03	735.3	258.6	104.9	0.8	1099.6
2003-04	709.0	259.9	104.8	0.8	1074.5
2004-05	624.7	214.9	104.7	0.4	944.7
<b>YIELD</b>					
<b>TONNES PER HECTARE</b>					
1994-95	43.0	57.3	44.7	55.8	46.7
1995-96	44.4	54.0	44.7	49.2	47.0
1996-97	39.7	52.2	44.7	51.4	43.5
1997-98	46.9	61.2	45.6	53.6	50.3
1998-99	42.8	63.0	45.7	54.4	47.8
1999-00	40.3	62.0	46.3	54.3	45.9
2000-01	43.4	50.5	45.2	53.7	45.4
2001-02	48.4	47.4	47.2	50.0	48.1
2002-03	45.1	53.4	48.1	50.8	47.3
2003-04	48.0	56.2	45.3	48.3	49.7
2004-05	49.8	52.4	45.3	54.8	49.9
<b>PRODUCTION</b>					
<b>000 TONNES</b>					
1994-95	28268.0	14310.3	4562.2	27.9	47168.4
1995-96	26880.0	13737.2	4583.0	29.5	45229.7
1996-97	24010.2	13110.6	4841.6	36.0	41998.4
1997-98	32110.8	15999.6	4956.5	37.5	53104.2
1998-99	33382.8	17050.7	4719.5	38.1	55191.1
1999-00	27081.3	14290.8	4917.1	43.4	46332.6
2000-01	26740.0	12049.7	4784.4	32.2	43606.3
2001-02	31803.1	11416.3	4787.2	35.0	48041.6
2002-03	33168.6	13797.6	5049.0	40.6	52055.8
2003-04	34023.0	14611.8	4745.6	38.6	53419.0
2004-05	31121.5	11263.8	4740.3	21.9	47147.5

**Sources:**

1. From 1994-95 to 2002-03: Agricultural Statistics of Pakistan 2002-03, MINFAL, Islamabad
2. For 2003-2004: Final estimates Provided by Provincial Agriculture Departments
3. For 2004-2005: Second estimates provided by respective Provincial Agriculture Departments.

## DISTRICT-WISE AREA AND PRODUCTION OF SUGARCANE: AVERAGE OF 2002-03 TO 2004-05

		Area = 000 hectares		Production = 000 tonnes							
S.No	District/Province	Area	Per cent	Production	Per cent	S.No	District/Province	Area	Per cent	Production	Per cent
<b>PUNJAB</b>						<b>NWFP</b>					
1	Faisalabad	109.67	10.55	5380.47	10.58	1	Mardan	31.20	3.00	1514.44	2.98
2	Jhang	88.33	8.50	4183.53	8.22	2	Charsada	32.11	3.09	1458.90	2.87
3	R.Y.Khan	53.17	5.11	3310.83	6.51	3	Peshawar	12.52	1.20	650.74	1.26
4	Sargodha	75.93	7.30	2996.17	5.89	4	D.I.Khan	10.94	1.05	459.45	0.90
5	Kasur	53.13	5.11	2327.07	4.57	5	Nowshera	5.71	0.55	289.99	0.57
6	T.T.Singh	40.73	3.92	2010.90	3.95	6	Malakand	4.59	0.44	194.13	0.38
7	M.Garh	30.93	2.98	1671.97	3.29	7	Swabi	3.78	0.36	155.28	0.31
8	M.B.Din	31.97	3.07	1365.93	2.68	8	Mohmand Agency	1.46	0.14	39.65	0.08
9	Okara	26.43	2.54	1302.00	2.56	9	Bannu	0.76	0.07	30.19	0.06
10	Bahawalnagar	23.77	2.29	1063.93	2.09	10	Buneri	0.29	0.03	9.32	0.02
11	Vehari	17.00	1.64	1049.60	2.06	11	Tank	0.33	0.03	8.06	0.02
12	Sheikhupura	20.13	1.94	831.50	1.63	12	Khyber Agency	0.30	0.03	6.42	0.01
13	Bhakkar	17.97	1.73	742.93	1.46	13	Dir	0.15	0.01	4.81	0.01
14	Layyah	13.63	1.31	614.83	1.21	14	Kohat	0.13	0.01	4.57	0.01
15	Bahawalpur	10.37	1.00	584.37	1.15	15	Haripur	0.11	0.01	4.00	0.01
16	Pakpattan	11.07	1.06	523.70	1.03	16	Lakki	0.11	0.01	3.71	0.01
17	Sahiwal	12.57	1.21	515.53	1.01	17	F.R. Bannu	0.08	0.01	3.07	0.01
18	Khaneval	8.63	0.83	437.73	0.86	18	F.R.D.I.Khan	0.07	0.01	2.78	0.01
19	Hafizabad	6.77	0.65	328.70	0.65	19	Bajour	0.09	0.01	2.48	0.00
20	Rajanpur	6.00	0.58	322.20	0.63	20	N/Waziristan	0.05	0.00	1.83	0.00
21	Khushab	8.10	0.78	265.63	0.52	21	F.R.Peshawar	0.02	0.00	0.42	0.00
22	Multan	2.53	0.24	157.27	0.31	22	Karak	0.01	0.00	0.38	0.00
23	Mianwali	3.47	0.33	143.83	0.28	23	Shanglajar	0.01	0.00	0.25	0.00
24	D.G.Khan	2.53	0.24	130.17	0.26	24	Manshera	0.00	0.00	0.08	0.00
25	Narowal	4.30	0.41	125.03	0.25	25	Swat	0.00	0.00	0.01	0.00
26	Gujrat	3.20	0.31	120.53	0.24	26	S/Waziristan	0.00	0.00	0.00	0.00
27	Gujranwala	2.40	0.23	82.03	0.16	27	Orakzai	0.00	0.00	0.00	0.00
28	Lodhran	1.47	0.14	70.07	0.14	28	Kurram Agency	0.00	0.00	0.00	0.00
29	Sialkot	2.27	0.22	68.47	0.13	29	Kohistan	0.00	0.00	0.00	0.00
30	Lahore	0.80	0.08	27.20	0.05	30	F.R.Kohat	0.00	0.00	0.00	0.00
31	Jhelum	0.20	0.02	8.73	0.02	31	Chitral	0.00	0.00	0.00	0.00
32	Attock	0.20	0.02	8.17	0.02	32	Battagram	0.00	0.00	0.00	0.00
33	Rawalpindi	0.00	0.00	0.00	0.00	33	Abbottabad	0.00	0.00	0.00	0.00
34	Islamabad	0.00	0.00	0.00	0.00						
35	Chakwal	0.00	0.00	0.00	0.00						
<b>Sub-total</b>		<b>689.67</b>	<b>66.34</b>	<b>32771.03</b>	<b>64.42</b>	<b>Sub-total</b>		<b>104.81</b>	<b>10.08</b>	<b>4844.96</b>	<b>9.52</b>
<b>SINDH</b>						<b>BALUCHISTAN</b>					
1	Hyderabad	59.63	5.74	3414.74	6.71	1	Sibi	0.33	0.03	15.47	0.03
2	Badin	43.88	4.22	2159.46	4.24	2	Lasbela	0.23	0.02	11.15	0.02
3	Nawab shah	32.21	3.10	1934.90	3.80	3	Nasirabad	0.11	0.01	6.51	0.01
4	N.Feroze	22.12	2.13	1364.51	2.68	4	Kachhi	0.01	0.00	0.37	0.00
5	Thatta	27.19	2.62	1311.45	2.58	5	Jaffarabad	0.00	0.00	0.19	0.00
6	Khairpur	22.52	2.17	1157.05	2.27						
7	Mirpurkhas	12.97	1.25	659.81	1.30						
8	Sanghar	11.36	1.09	632.91	1.24						
9	Sukkur	4.23	0.41	197.11	0.39						
10	Ghotki	3.69	0.36	184.22	0.36						
11	Dadu	3.44	0.33	164.33	0.32						
12	Larkana	0.62	0.06	24.57	0.05						
13	Tharparkar	0.42	0.04	13.15	0.03						
14	Shikarpur	0.11	0.01	4.05	0.01						
15	Jacobabad	0.05	0.01	2.13	0.00						
16	Umer Kot	0.00	0.00	0.00	0.00						
17	Karachi	0.00	0.00	0.00	0.00						
<b>Sub-total</b>		<b>244.45</b>	<b>23.51</b>	<b>13224.40</b>	<b>25.99</b>	<b>Sub-total</b>		<b>0.68</b>	<b>0.06</b>	<b>33.70</b>	<b>0.07</b>
<b>Total (PAKISTAN)</b>		<b>1039.60</b>	<b>100.00</b>	<b>50874.09</b>	<b>100.00</b>						

## 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 sugarcane is not grown or for which the data are not available, are excluded.

## Source:

Ministry of Food, Agriculture and Livestock, Islamabad.

**AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN THE PUNJAB:  
2004-05 AND 2005-06 CROPS**

Sr. No.	Operations / inputs	Avg No. of oprs/units/acre	2004 - 05 Crop		2005 - 06 Crop		Change in 2005-06 over 2004-05
			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	0.476	410.00	195.16	425.00	202.30	7.14
	1.2 Rotavator	0.152	450.00	68.40	465.00	70.68	2.28
	1.3 Ploughing	7.847	150.00	1177.05	155.00	1216.29	39.24
	1.4 Planking	3.309	75.00	248.18	75.00	248.18	0.00
	1.5 Levelling	0.561	200.00	112.20	205.00	115.01	2.80
2.	Seed bed preparation:						
	2.1 Ploughing/Furrow making	0.467	150.00	35.03	155.00	36.19	1.17
	2.2 Planking	0.193	75.00	7.24	75.00	7.24	0.00
	2.3 Trench/Ridge making						
	2.3.1 Manual (m.days)	0.106	100.00	5.30	120.00	6.36	1.06
	2.3.2 Tractor	0.700	150.00	52.50	155.00	54.25	1.75
	2.4 Bund making						
	2.4.1 Manual (m.days)	1.655	100.00	82.75	120.00	99.30	16.55
	2.4.2 Tractor	0.158	150.00	11.85	155.00	12.25	0.40
3.	Seed and Sowing operations:						
	3.1 40 kg units	6.578	45.00	148.01	45.00	148.01	0.00
	3.2 Manures	10.640	225.00	1197.00	225.00	1197.00	0.00
	3.3 Harvesting, stripping and making of set (m.days)	4.796	100.00	239.80	120.00	287.76	47.96
	3.4 Transport	-	-	115.00	-	120.00	5.00
	3.5 Sowing of sets (m.days)	0.781	100.00	39.05	120.00	46.86	7.81
	3.6 Contract sowing	-	-	120.00	-	145.00	25.00
4.	Interculture and Earthing up:						
	4.1 Manual/binding of plants	0.609	395.00	240.56	475.00	289.28	48.72
	4.2 Bullock/tractor	2.008	150.00	301.20	155.00	311.24	10.04
5.	Plant Protection:						
	5.1 Weedicides	0.124	220.00	27.28	225.00	27.90	0.62
	5.2 Granules	0.070	215.00	15.05	220.00	15.40	0.35
	5.3 Spays	0.331	195.00	64.55	200.00	66.20	1.66
	5.4 Others	0.161	450.00	72.45	460.00	74.06	1.61
6.	Irrigation:						
	6.1 Canal	8.900	-	177.16	-	250.00	72.84
	6.2 Private tubewell	4.440	352.00	1562.88	380.00	1687.20	124.32
	6.3 Mixed	2.160	79.00	170.64	85.00	183.60	12.96
7.	Labour for irrigation and water course cleaning (m.days)	4.860	100.00	486.00	120.00	583.20	97.20
8.	Farm Yard Manure:						
	8.1 Material	-	-	500.00	-	550.00	50.00
	8.2 Transport & application	-	-	400.00	-	425.00	25.00
9.	Fertilizers: (bags)						
	9.1 DAP	1.280	898.00	1149.44	1048.00	1341.44	192.00
	9.2 Urea	1.730	418.00	723.14	487.00	842.51	119.37
	9.3 Nitrophos	0.350	628.00	219.80	711.00	248.85	29.05
	9.4 SSP	0.010	307.00	3.07	374.00	3.74	0.67
	9.5 CAN	0.010	289.00	2.89	390.00	3.90	1.01
	9.6 SOP	0.070	779.00	54.53	969.00	67.83	13.30
	9.7 Gypsum	0.440	40.00	17.60	40.00	17.60	0.00
10.	Fert. transport and application	3.890	23.00	89.47	25.00	97.25	7.78
11.	Mark up @ 8.0 % per annum for 13 months on items 1 to 10 minus item 6.1	-	-	1186.64	-	940.23	-246.41
12.	Land rent for 13 months	-	4500.00	4875.00	5000.00	5416.67	541.67
13.	Weighted average land tax @ Rs 131/acre/annum for 13 months	-	-	130.00	-	142.00	12.00
14.	Management charges for 13 months	-	-	534.00	-	598.00	64.00
15.	Harvesting & stripping (40 kg units)	565.150	5.00	2797.49	6.00	3356.99	559.50
16.	Expected escalation in cost of selected items	-	-	680.00	-	640.00	-40.00
17.	Total cost (items 1 to 16)	-	-	20335.34	-	22192.74	1857.41
18.	Yield (40 kg units)	-	-	565.15	-	565.15	0.00
19.	Cost of production at farm level: (Rs/40 kgs)						
	19.1 including land rent	-	-	35.98	-	39.27	3.29
	19.2 excluding land rent	-	-	27.36	-	29.68	2.33
20.	Marketing expenses: (Rs/40 kgs)						
	20.1 Transport, etc.	-	-	5.00	-	5.50	0.50
	20.2 Development cess	-	-	0.25	-	0.25	0.00
21.	Cost of production at mill-gate: (Rs/40 kgs)						
	21.1 including land rent	-	-	41.23	-	45.02	3.79
	21.2 excluding land rent	-	-	32.61	-	35.43	2.83

Note: Mark-up for 2004-05 crop has worked out @ 11 per cent per annum.

**AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN SINDH:  
2004-05 AND 2005-06 CROPS**

Sr. No.	Operations / inputs	Avg No. of oprs/units/acre	2004 - 05 Crop		2005 - 06 Crop		Change in 2005-06 over 2004-05
			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	0.523	440.00	230.12	500.00	261.50	31.38
	1.2 Ploughing	5.606	220.00	1233.32	250.00	1401.50	168.18
	1.3 Planking	1.577	110.00	173.47	125.00	197.13	23.66
	1.4 Levelling	0.972	220.00	213.84	250.00	243.00	29.16
2.	Seed bed preparation:						
	2.1 Ploughing/Furrow making	1.136	220.00	172.44	250.00	195.96	23.52
	2.2 Planking	1.340	110.00	101.71	125.00	115.58	13.87
	2.3 Trench/ridge making						
	2.3.1 manual (m.days)	0.074	100.00	5.11	120.00	6.13	1.02
	2.3.2 tractor (hrs)	0.174	180.00	21.61	205.00	24.61	3.00
	2.4 Bund making (m.days)						
	2.4.1 manual (m.days)	0.403	100.00	27.81	120.00	33.37	5.56
	2.4.2 tractor (hrs)	0.812	180.00	100.85	205.00	114.86	14.01
3.	Seed and Sowing operations:						
	3.1 40-kg units	64.118	55.00	2433.28	55.00	2433.28	0.00
	3.2 Ghuntas	0.685	1340.00	633.35	1340.00	633.35	0.00
	3.3 Harvesting, stripping and making of set (m.days)	4.420	100.00	304.98	120.00	365.98	61.00
	3.4 Transportation	-	-	220.00	-	230.00	10.00
	3.5 Sowing of sets (m.days)	0.588	100.00	40.57	120.00	48.69	8.11
	3.6 Contract sowing	-	-	195.00	-	235.00	40.00
4.	Interculture and Earthing up:						
	4.1 Manual	1.762	380.00	669.56	455.00	801.71	132.15
	4.2 Bullock/tractor	1.725	220.00	379.50	250.00	431.25	51.75
5.	Plant Protection :						
	5.1 Weedicides	0.344	297.00	102.17	305.00	104.92	2.75
	5.2 Granules	0.342	205.00	70.11	210.00	71.82	1.71
	5.3 Sprays	0.398	211.00	83.98	215.00	85.57	1.59
6.	Irrigation						
	6.1 Canal	20.880	-	181.87	-	181.87	0.00
	6.2 Private tubewell	2.450	188.00	460.60	198.00	485.10	24.50
7.	Labour for irrigation and water course cleaning (m.days)	5.859	100.00	585.90	120.00	703.08	117.18
8.	Farm Yard Manure:						
	8.1 Material	-	-	750.00	-	825.00	75.00
	8.2 Transport & application	-	-	385.00	-	410.00	25.00
9.	Fertilizers: (bags)						
	9.1 DAP	1.512	880.00	1330.56	1033.00	1561.90	231.34
	9.2 Urea	3.625	418.00	1515.25	455.00	1649.38	134.13
	9.3 Nitrophos	0.376	680.00	255.68	743.00	279.37	23.69
	9.4 CAN	0.185	313.00	57.91	330.00	61.05	3.14
	9.5 AS	0.046	400.00	18.40	390.00	17.94	-0.46
	9.6 SOP	0.085	750.00	63.75	925.00	78.63	14.88
10.	Fert. transport and application	5.829	23.00	134.07	25.00	145.73	11.66
11.	Mark up @ 8.0 % per annum for 16 months months on item 1 to 10 minus item 6.1	-	-	1928.05	-	1539.65	-388.40
12.	Land rent for 16 months	-	2500.00	3333.33	4500.00	6000.00	2666.67
13.	Land tax @ Rs 200/acre/annum for 16 months	-	-	266.67	-	266.67	0.00
14.	Drainage cess	-	-	24.00	-	24.00	0.00
15.	Management charges for 16 months	-	-	657.00	-	736.00	79.00
16.	Harvesting & stripping (40 kg units)	676.020	5.00	3380.10	6.00	4056.12	676.02
17.	Expected escalation in the cost of selected it	-	-	645.00	-	583.00	-62.00
18.	Total cost (items 1 to 17)	-	-	23385.90	-	27639.65	4253.75
19.	Yield (40 kg units)	-	-	676.02	-	676.02	0.00
20.	Cost of production at farm level: (Rs/40 kgs)						
	20.1 including land rent	-	-	34.59	-	40.89	6.30
	20.2 excluding land rent	-	-	29.66	-	32.01	2.35
21.	Marketing expenses: (Rs/40 kgs)						
	21.1 Transport, etc.	-	-	5.00	-	5.50	0.50
	21.2 Development cess	-	-	0.32	-	0.32	0.00
22.	Cost of production at mill-gate: (Rs/40 kgs)						
	22.1 including land rent	-	-	39.91	-	46.71	6.80
	22.2 excluding land rent	-	-	34.98	-	37.83	2.85

Note: Mark-up for 2004-05 crop has worked out @ 11 per cent per annum.

**AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN NWFP:  
2004-05 AND 2005-06 CROPS**

Sr. No.	Operations / inputs	Avg No. of oprs/units/acre -	2004 - 05 Crop		2005 - 06 Crop		Change in 2005-06 over 2004-05
			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/Rotavator	0.665	450.00	299.25	475.00	315.88	16.63
1.2	Ploughing	2.776	180.00	499.68	190.00	527.44	27.76
1.3	Planking	0.435	90.00	39.15	95.00	41.33	2.18
1.4	Levelling	0.344	180.00	61.92	190.00	65.36	3.44
2.	Seed bed preparation:						
2.1	Ploughing/Furrow making	0.982	180.00	91.92	190.00	97.02	5.11
2.2	Planking	0.027	90.00	1.26	95.00	1.33	0.07
2.3	Trech/Ridge making (tractor hrs)	0.039	180.00	3.65	190.00	3.85	0.20
2.4	Bund making (m.days)	1.274	95.00	62.94	115.00	76.19	13.25
3.	Seed and Sowing operations:						
3.1	40 kg units	76.337	55.00	2183.24	55.00	2183.24	0.00
3.2	Harvesting, stripping and making of set (m.days)	3.671	95.00	181.35	115.00	219.53	38.18
3.3	Transport	-	-	185.00	-	195.00	10.00
3.4	Sowing of sets (m.days)	4.097	95.00	202.39	115.00	245.00	-42.61
4.	Interculture and Earthing up :						
4.1	Manual/binding of plants	1.642	440.00	722.48	530.00	870.26	147.78
4.2	Bullock/tractor	1.859	180.00	334.62	190.00	353.21	18.59
5.	Plant Protection:						
5.1	Weedicides	0.336	300.00	100.80	307.00	103.15	2.35
5.2	Granules	0.094	264.00	24.82	270.00	25.38	0.56
5.3	Sprays	0.306	188.00	57.53	192.00	58.75	1.22
5.4	Others	0.261	253.00	66.03	259.00	67.60	1.57
6.	Irrigation:						
6.1	Canal	15.19	-	499.20	-	499.20	0.00
6.2	Private tubewell	2.61	225.00	587.25	230.00	600.30	13.05
6.3	Private canal (manual labour)	2.43	10.00	24.30	12.00	29.16	4.86
7.	Labour for irrigation and water course cleaning (m.days)	7.953	95.00	755.54	115.00	914.60	159.06
8.	Farm Yard Manure:						
8.1	Material	-	-	800.00	-	880.00	80.00
8.2	Transport & application	-	-	530.00	-	563.00	33.00
9.	Fertilizers: (bags)						
9.1	DAP	0.830	900.00	747.00	1035.00	859.05	112.05
9.2	Urea	1.970	418.00	823.46	470.00	925.90	102.44
9.3	Nitrophos	0.330	660.00	217.80	750.00	247.50	29.70
9.4	CAN	0.130	300.00	39.00	320.00	41.60	2.60
10.	Fert. transport and application	3.260	23.00	74.98	25.00	81.50	6.52
11.	Mark up @ 8.0 % per annum for 15 months months on item 1 to 10 minus item 6.1	-	-	1325.83	-	1051.06	-274.76
12.	Land rent for 15 months	-	4500.00	5625.00	5000.00	6250.00	625.00
13.	Weighted average land tax @ Rs 75/acre/ annum for 15 months	-	-	93.75	-	93.75	0.00
14.	Management charges for 15 months	-	-	616.00	-	690.00	74.00
15.	Harvesting & stripping (40 kg units)	585.460	5.00	673.28	6.00	807.93	134.66
16.	Expected escalation in cost of selected items	-	-	365.00	-	323.00	-42.00
17.	Total cost (items 1 to 16)	-	-	18915.40	-	20307.06	1391.66
18.	Yield (40 kg units)	-	-	585.46	-	585.46	0.00
19.	Cost of production at farm level: (Rs/40 kgs)						
19.1	including land rent	-	-	32.31	-	34.69	2.38
19.2	excluding land rent	-	-	22.70	-	24.01	1.31
20.	Marketing expenses: (Rs/40 kgs)						
20.1	Transport, etc.	-	-	4.50	-	5.50	1.00
20.2	Development cess	-	-	0.27	-	0.27	0.00
21.	Cost of production at mill-gate: (Rs/40 kgs)						
21.1	including land rent	-	-	37.08	-	40.46	3.38
21.2	excluding land rent	-	-	27.47	-	29.78	2.31

Note: Mark-up for 2004-05 crop has worked out @ 11 per cent per annum.

**Notes for Annex- III to V.**

1. The physical input-output parameters for estimating cost of production for sugarcane 2005-06 Crop have been adopted from the Support Price Policy for sugarcane 2004-05 Crop, APCom's Series No. 209.
2. Seed and related costs (items 2 and 3) for the fresh planted crop have been estimated @ 50, 69 and 52 per cent of their original values for the Punjab, Sindh and NWFP respectively in view of the incidence of ratooning reported @ 50, 31 and 48 per cent during sugarcane's large field survey for 1999-00 crop.
3. The wage rates, farm inputs prices and custom hire rates of field operations involved in the sugarcane cultivation have been revised in view of the prevailing market rates as collected through the mini field survey conducted by the APCom during Oct-Nov 2004 in the major sugarcane growing regions of the Punjab, Sindh and NWFP and discussions in the meeting of the Standing Committee on sugarcane, held on 18<sup>th</sup> November, 2004 at Multan.
4. The cost of plant protection has not been increased in light of the information that the increasing trend in the prices of pesticides, insecticides etc. has been arrested on account of new generic and low cost pesticides and insecticides. However, the cost of labour component (10 per cent of the total cost) has been revised in light of new wage rate.
5. The cost of supplementary irrigation has been updated in view of rises @ about 8.82 per cent in the prices of diesel. Based on the ratios of electric and diesel tube-wells of 10:90 in the Punjab, 41:59 in Sindh and 79: 21 in NWFP, reported in the Agriculture Statistics of Pakistan, 2002-03, MINFAL (Economic Wing), Islamabad, the magnitude of increases has been estimated as 8 per cent in the Punjab, 5 per cent in Sindh and 2 per cent in the NWFP.
6. Canal water rate in the Punjab has been revised in the light of the data received from the government of Punjab.
7. Transportation costs have been adjusted in view of increases in the prices of diesel.
8. The rates of chemical fertilizers have been revised in view of the fertilizers prices published by the Federal Bureau of Statistics, Islamabad for the week ending on 16<sup>th</sup> December, 2004 and supplemented with the data obtained through the field survey as mentioned above.
9. The management charges for a manager looking after a 25-acre farm and devoting one-fourth of his time to the managerial activities have been worked at Rs 4598 per month for a Field Assistant at the 10<sup>th</sup> stages in BPS-6, including

special additional allowance @ 25 per cent and 15 per cent ad-hoc relief each announced in the 2003-04 and 2004-05 budgets.

10. In view of the 1999-00 Crop survey, about 1 per cent of the acreage under sugarcane was harvested in lieu of sugarcane tops in the Punjab and 77 per cent in NWFP. The expenditure on account of harvesting and stripping has been adjusted accordingly.
11. The likely escalation in the cost of operations like interculture, plant protection, supplementary irrigation, nitrogenous fertilizer, harvesting/stripping and marketing during 2005-06 crop year has been estimated as 8 per cent in the Punjab, 6 per cent in Sindh and 7 per cent in the NWFP on the basis of weighted average annual increase in their costs for the last 4 years.
12. In the cost of cultivation of sugarcane, land rent is the major item in all the provinces. The land rent is affected by several parameters and substantially varies from place to place. For updating the land rentals there is no precise measure available at hand. However, keeping in view the observations obtained during the field survey of sugarcane and discussion made in the meeting of APCom's Standing Committee on sugarcane, land rentals have been adjusted accordingly.

**PER CAPITA AVAILABILITY (CONSUMPTION) OF SUGAR:  
1994-95 TO 2003-04 ( October - September)**

S.No.	Item	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
----- Thousand tonnes -----											
1	Opening stocks as on 1st October	309	265	104	245	513	371	27	621	637	759
2	Production	3001	2470	2393	3555	3542	2429	3016	3249	3677	4021
3	Imports	4	166	604	11	4	421	633	27	9	10
4	Exports	328	29	---	477	648	22	---	8	81	73
5	Closing stocks as on 30 September	265	104	245	513	371	27	621	637	759	809
6	Net availability (item 1+2+3-4-5)	2721	2768	2856	2821	3040	3172	3055	3252	3483	3908
----- Million -----											
7	Population on first April (a)	127.00	130.04	132.96	136.19	139.07	142.34	145.64	149.16	152.87	156.86
----- Kgs per annum -----											
8	Per capita availability (consumption)	21.43	21.29	21.48	20.71	21.86	22.28	20.98	21.80	22.78	24.91
9	Average per capita availability										
	i) Average ( 1994-95 to 2003-04)				21.96						
	ii) Forecast for 2004-05				23.15						

**Note:** (a) Population of AJ&K, NAs and Afghan refugees have also been included:

**Sources:**

1. For Stocks and Production: Pakistan Sugar Mills Association, Islamabad.
2. For Imports and Exports: Federal Bureau of Statistics, Karachi.
3. For Population of Pakistan: Economic Survey, 2003-04.
4. For Population of AJ&K and NAs: Population Census Organization, Islamabad.
5. For Population of Afghan refugees: Kashmir Affairs and Northern Areas and States and Frontier Regions Division, Government of Pakistan, Islamabad.

**MONTHLY AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR  
DOMESTIC MARKETS: 2003 AND 2004**

Year/Month	Lahore	Faisalabad	Karachi	Hyderabad	Peshawar	Average
----- Rupees per 100 kgs -----						
<b>2003</b>						
January	2124	2082	2070	2048	2140	2093
February	2090	1946	1950	1978	2150	2023
March	1856	1860	1828	1868	1930	1868
April	1856	1860	1786	1790	1900	1838
May	1946	1890	1856	1815	1940	1889
June	1910	1879	1846	1753	1914	1860
July	1880	1860	1810	1768	1890	1842
August	1840	1817	1768	1778	1860	1813
September	1800	1782	1760	1773	1820	1787
October	1834	1865	1850	1775	1934	1852
November	1828	1770	1835	1750	1863	1809
December	1786	1736	1700	1677	1853	1750
<b>Average</b>	<b>1896</b>	<b>1862</b>	<b>1838</b>	<b>1814</b>	<b>1933</b>	<b>1869</b>
<b>2004</b>						
January	1774	1628	1663	1621	1817	1700
February	1734	1648	1641	1604	1825	1691
March	1725	1629	1650	1578	1788	1674
April	1763	1709	1738	1694	1725	1726
May	1779	1762	1825	1802	1786	1791
June	1838	1811	1815	1780	1854	1820
July	1842	1823	1856	1809	1884	1843
August	1924	1911	1950	1913	1934	1926
September	1925	1933	1928	1916	1969	1934
October	1930	1947	1955	1922	1975	1946
November	1921	2004	2107	1988	1976	1999
December	1847	1819	1843	1802	1876	1837
<b>Average</b>	<b>1833</b>	<b>1802</b>	<b>1831</b>	<b>1786</b>	<b>1867</b>	<b>1824</b>

Source: ALMA, Karachi.

**ANNUAL AVERAGE WHOLESALE PRICES OF SUGAR IN  
MAJOR DOMESTIC MARKETS: 1994-95 TO 2004-05  
( October - September )**

Year (October - September)	Lahore	Faisalabad	Karachi	Hyderabad	Peshawar	Average	Increase (+) decrease (-) in average price over previous year
	----- Rupees per 100 kgs -----						<u>Percent</u>
1994-95	1355	1348	1333	1345	1368	1350	—
1995-96	1695	1705	1650	1625	1718	1679	24.38
1996-97	1988	2020	1975	1923	2110	2003	19.33
1997-98	1745	1713	1720	1643	1835	1731	-13.58
1998-99	1865	1861	1823	1726	1864	1828	5.59
1999-00	2179	2168	2087	2082	2183	2140	17.06
2000-01	2551	2524	2482	2353	2566	2478	15.82
2001-02	2069	2042	2063	2022	2073	2054	-17.11
2002-03	1939	1906	1892	1872	1972	1916	-6.71
2003-04	1813	1769	1788	1743	1853	1793	-6.43
2004-05*	1899	1923	1968	1904	1942	1927	7.50

Note\* Prices are upto December 04  
Source: ALMA, Karachi.

**ECONOMICS OF SUGARCANE AND COMPETING CROPS  
AT PRICES REALIZED BY GROWERS: 2004-05 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 cost	Crop day	Acre inch of water used
1	2	3	4	5	6	7=6-5	8=6-4	9=8/4	10 = 6/5	11=6/2	12 = 8/3
	Days	Acre inches	----- Rupees per acre -----				----- Rupees -----				
<b>Punjab</b>											
1. Sugarcane	394	48	19748	6778	19639	12861	-109	0.99	2.90	49.85	409.15
2. Cotton	240	22	14917	6680	15549	8869	632	1.04	2.33	64.79	706.77
3. Basmati paddy	180	58	11289	6280	8942	2662	-2347	0.79	1.42	49.68	154.17
4. IRRI paddy	180	62	9544	5295	9367	4072	-177	0.98	1.77	52.04	151.08
5. Wheat	180	17	11022	6040	10702	5662	-320	0.97	2.12	59.46	629.53
6. Sunflower (spring)	144	22	8313	2828	10125	7297	1812	1.22	3.58	70.31	460.23
7. Cotton+Wheat	420	39	26939	11720	26251	14531	312	1.01	2.24	62.50	673.10
8. Cotton+Sunflower	384	44	23230	9508	25674	16166	2444	1.11	2.70	66.86	583.50
9. Basmati paddy + wheat	360	75	22311	11320	19644	8324	-2667	0.88	1.74	54.57	261.92
10. Basmati paddy+Sunflower	324	80	19602	9108	19067	9959	-635	0.97	2.09	58.85	238.34
11. IRRI paddy + wheat	360	79	20566	10335	20089	9734	-497	0.98	1.94	55.75	254.04
12. IRRI paddy+Sunflower	324	84	17857	8123	19492	11369	1635	1.09	2.40	60.16	232.05
<b>Sindh</b>											
1. Sugarcane	488	71	22870	8800	24120	15320	7570	1.05	2.74	49.43	339.72
2. Cotton	240	18	12328	5205	13698	8493	1370	1.11	2.63	57.08	761.00
3. IRRI paddy	180	55	8237	3702	10776	7074	2539	1.31	2.91	59.87	192.43
4. Wheat	180	15	9375	3912	9834	5922	459	1.05	2.51	54.63	655.60
5. Sunflower (Spring)	144	22	8313	2828	10125	7297	1812	1.22	3.58	70.31	460.23
6. Cotton+Wheat	420	33	21703	9117	23532	14416	1829	1.08	2.58	56.03	713.09
7. Cotton+Sunflower	384	40	20641	8033	23823	17264	3182	1.15	2.97	62.04	595.58
8. IRRI paddy+Wheat	360	71	17612	7614	20610	12996	2998	1.17	2.71	57.25	290.28
9. IRRI paddy+Sunflower	324	78	16550	6530	20901	13495	4351	1.25	3.20	64.51	267.96

### Notes for Annexes - IX

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2004-05 crops.
2. The data regarding input-output parameters have been adopted from the APCom's support price policy papers for sugarcane, seed cotton, rice paddy and wheat, 2004-05 crops. However, the relevant data for sunflower and canola were adopted from the last support price policy for non-traditional oilseeds, 2000-01 crops with necessary adjustments in input prices for updating costs and incomes for the 2004-05 crops. To incorporate the escalations in input prices which occurred during the growing period of 2004-05 crops, some marginal revisions have been made as under:
  - 2.1 There has been no considerable change in the price of diesel and power tariff over the period. Therefore, the cost of supplementary irrigation is expected to remain at the same level.
  - 2.2 The cost of fertilizers has been revised in view of their prices prevailed at the time of application for the respective crops in 2004-05 season.
3. Water use has been estimated from the number of irrigations as reported in the cost of production estimates of the respective crops assuming each irrigation of 3 inches and 'rauni' of 4 inches.
4. The following prices as realized by the growers for different crops are adopted for the analysis:
  - 4.1 As the wheat crop is yet to be harvested, the support price of Rs 400 per 40 kgs for 2004-05 crop has been adopted for the current analysis.
  - 4.2 The market prices of rice paddy are not yet available from the provinces. However the farm-gate prices of basmati and IRRI paddy in major producing areas during the post-harvest months in the Punjab are reported at Rs 358 and 263 per 40 kgs in the APCom's field survey respectively. In Sindh, the average wholesale market prices of IRRI paddy in the main producer area markets during the post-harvest months are reported at Rs 290 per 40 kgs in the APCom's field survey.
  - 4.3 The wholesale market prices of seed cotton during the post-harvest months of Aug-Nov 2004-05 in the main producer area markets have averaged at Rs 901 per 40 kgs in the Punjab as reported by the Directorate of Agriculture (E&M), Lahore. In Sindh, the corresponding prices are reported at Rs 903 per 40 kgs by the PCCC, Karachi.
  - 4.4 The sunflower 2004-05 crop is yet to be harvested. However, it was reported by the POdB Islamabad that All Pakistan Solvent Extractor Association would purchase sunflower at Rs 690 per 40 kgs during the season provided that the price of domestic edible oil does not fall below Rs 46217 per tonne.

- 4.5 The market prices of sugarcane are not available from any agency. However, the mill-gate prices in the major cane producing areas are reported to hover around Rs 40 per 40 kgs in the Punjab and Rs 41 in Sindh in the APCom's field survey and the Standing Committee meeting.
5. The market prices have been adjusted for the marketing expenses to make them effective at the farm level. These expenses amount to Rs 5.25 per 40 kgs in Punjab and Rs 5.32 in Sindh for sugarcane, Rs 18 in Punjab and Rs 20 in Sindh for seed cotton, Rs 14 for rice paddy and Rs 15 for wheat and oilseeds.
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.

**MILL - GATE PRICES OF SUGARCANE WORKED BACK FROM  
THE AVERAGE WHOLESALE PRICES OF GUR DURING 2004-05  
CRUSHING SEASON (OCTOBER - DECEMBER)**

S.No	Item	Unit	N.W.F.P	Punjab
1	Gur produced from 400 kgs of cane	Kgs	(a) 40.00	(a) 40.00
2	Sale value of gur produced	Rs/40 kgs	740.00	660.00
3	Marketing cost of gur including transport, commission, etc.	Rupees	50.00	30.00
4	Net value of gur at farm level (item 2 minus item 3)	Rupees	<b>690.00</b>	<b>630.00</b>
5	Processing cost including cane crushing and labour used for gur making	Rupees	130.00	150.00
6	Cost of chemicals.	Rupees	22.00	25.00
7	Net value of 400 kgs of cane (item 4 minus 5 minus 6)	Rupees	538.00	455.00
8	Value of 40 kgs of sugarcane	Rupees	53.80	45.50
9	Marketing cost of cane, i.e., transport and development cess.	Rupees	5.77	5.75
10	Mill-gate price per 40 kgs of cane (item 8 plus 9)	Rupees	59.57	51.25

**Notes:** Based on the information collected during Agricultural Prices Commission field survey, October and December, 2004.

(a) 10 percent recovery has been taken.

**MILL-GATE PRICES OF SUGARCANE WORKED BACK FROM  
THE AVERAGE WHOLESALE MARKET PRICES OF SUGAR DURING  
2004-05 CRUSHING SEASON ( NOVEMBER -DECEMBER)**

S.No	Item	Rupees per tonne		
1	Average wholesale market price of sugar (a)	19180		
2	Wholesale dealer margin @ 5 % on net price	799		
3	Sales tax @ 15 per cent on net price	2398		
4	Net price (item 1 minus 2 minus 3)	15983		
		<b>Punjab &amp; N.W.F.P</b>		<b>Sindh</b>
5	Processing cost of sugar (b)	5434		5434
6	Value of cane to produce one tonne of sugar (item 4 minus 5)	10549		10549
7	Provincial recovery (Percent)	8.50		8.70
8	Tonnes of cane required to produce one tonne of sugar ( 100 divided by item 7)	11.76		11.49
9	Mill - gate price of sugarcane ( Rupees per tonne) (item 6 divided by item 8)	896.67		917.76
10	Mill - gate price of sugarcane (Rs per 40 kgs)	35.87		36.71

- Notes** a) Average price of Lahore, Faisalabad and Hyderabad market during current crushing season i.e, November to December .
- b) Ratio between costs of cane and its processing into sugar has been estimated at 66:34 from publication " Cost of Production of Sugar" jointly prepared in 1996 by Agricultural Prices Commission and Business and Consultancy Services.

- Source** 1. For average market price of sugar: ALMA, Karachi.
2. For sales tax: Central Board of Revenue (CBR), Islamabad

## AVERAGE INTERNATIONAL PRICES OF SUGAR: 1994-95 TO 2004-05 ( OCT - SEP)

Years	ISA Daily price of Raw sugar (Fob and stowed Caribbean ports in bulk)		London Daily price of White sugar ( fob and stowed European ports in bags of 50 kgs)		Difference between White and raw sugar prices		
	US Cents/ lb	US\$/ per tonne	US Cents/ lb	US\$/ per tonne	US Cents/ lb	US\$/ per tonne	Per cent of White Sugar
1994-95	13.72	302.47	17.99	396.61	4.27	94.14	23.74
1995-96	12.25	270.06	17.41	383.82	5.16	113.76	29.64
1996-97	11.10	244.71	14.48	319.23	3.38	74.52	23.34
1997-98	9.89	218.03	12.33	271.83	2.44	53.80	19.79
1998-99	6.63	146.20	9.79	215.83	3.16	69.63	32.25
1999-00	7.23	159.30	9.18	202.38	1.95	43.08	21.29
2000-01	9.34	205.91	11.35	250.29	2.01	44.38	17.71
2001-02	6.85	151.01	10.59	232.48	3.74	81.47	35.32
2002-03	8.12	179.03	10.36	228.35	2.24	49.32	21.59
2003-04	6.57	144.79	10.16	223.93	3.59	79.15	35.35
2004-05 ( Oct-Nov)	8.31	183.09	11.24	247.81	2.94	64.71	26.11
October	8.45	186.29	11.21	247.18	2.76	60.89	24.62
November	8.16	179.89	11.27	248.43	3.11	68.54	27.60

Source: International Sugar Organization, London "Monthly Market Reports and Press Summaries"  
( Various reports )

ECONOMIC IMPORT PARITY PRICES OF SUGARCANE AT MILL-GATE AS WORKED BACK  
FROM AVERAGE FOB (LONDON) PRICE OF WHITE SUGAR

Item	1999-00 to 2003-04		2004- 05 (Oct-Nov)	
	.... US \$ per tonne ....			
1. Average fob (London) price	227.49		247.81	
2. Freight charges upto Karachi	30.00		30.00	
3. C & f cost at Karachi port	257.49		277.81	
	OR ... Rs. per tonne (a)...			
4. Marine insurance (actual)	15411		16627	
5. <b>Import value (Items 3+4)</b>	56		56	
6. L/C opening charges @ 0.5% of c&f cost	15467		16683	
7. Foreign Bank charges (actual)	77		83	
8. Mark up on retirement of documents by bank for 60 days @ 12% per annum of c&f cost	1		1	
9. Wharfage, handling and stevedoring charges (Actual)	304		328	
10. Allowance for shortage and unforeseen expenses @ 1% of c&f cost	610		610	
11. Service charges of inspection @ 0.5% (cif) value	154		166	
12. Importer commission @ 1% of c&f cost	77		83	
13. Transport charges from Karachi to Lahore (b) including loading/unloading	154		166	
14. <b>Landed cost at Lahore (Items 6 to 13)</b>	1350		1350	
	18195		19471	
	Punjab & NWFP	Sindh	Punjab & NWFP	Sindh
15. Processing cost of sugar (c)	6186.14	6186.14	6620.20	6620.20
16. Value of cane to produce one tonne of sugar (item 14 minus item 15)	12008.40	12008.40	12850.97	12850.97
17. Provincial base recovery level (%)	8.50	8.70	8.50	8.70
18. Quantity of cane in tonnes required to produce one tonne of sugar (100 / item 17)	11.76	11.49	11.76	11.49
19. Price of one tonne of sugarcane (item 16 / item 18) (Rs per tonne)	1021.12	1045.12	1092.77	1118.45
20. Price of 40 kgs of cane (Rs per 40 Kgs)	40.84	41.80	43.71	44.74

Sources: i) For average fob (London) price: Annex XII.  
ii) For freight, incidentals and duties: Trading Corporation of Pakistan, Karachi.

Notes: (a) Worked out at the selling exchange rate of one US \$ = 59.85 Pak rupees, announced by State Bank of Pakistan as on December, 21, 2004.  
(b) Assuming that imported sugar will be consumed at Lahore.  
(c) Ratio of cost of cane to processing cost has been estimated at 66:34 from publication " Cost of Production of Sugar " jointly prepared in 1996 by APCom and Business & Consultancy Services.

FINANCIAL IMPORT PARITY PRICES OF SUGARCANE AT MILL-GATE AS WORKED BACK  
FROM AVERAGE FOB (LONDON) PRICE OF WHITE SUGAR

Item	1999-00 to 2003-04		2004-05 (Oct-Nov)	
	.... US \$ per tonne ....			
1. Average fob (London) price	227.49		247.81	
2. Freight charges upto Karachi	30.00		30.00	
3. C & f cost at Karachi port	257.49		277.81	
	-----Rs per tonne-----			
4. Marine insurance (actual)	15411		16627	
5. <b>Import value (items 3+4)</b>	56		56	
6. Custom duty @25 % of import value	15467		16683	
7. Sales tax @ 15% of (Import value + Custom duty)	3867		4171	
8. Custom duty, Sales tax & Wharfage on empty bages	2900		3128	
9. <b>Duty paid value ( DPV )(items 5+6+7+8)</b>	165		165	
10. Income tax @6% at import stage of DPV	22399		24147	
11. Income tax on empty bags(fixed)	1344		1449	
12. Income tax @3.5% of sale stage	40		40	
13. L/C opening charges @ 0.5% of c&f cost	964		1034	
14. Foreign Bank charges (actual)	77		83	
15. Mark up on retirement of documents by bank for 60 days @ 12% per annum of c&f cost	1		1	
16. Wharfage, handling and stevedoring charges	304		328	
17. Allowance for shortage and unforeseen expenses @ 1% of c&f cost	610		610	
18. Sindh Govt excise duty @ 0.3% of DPV	154		166	
19. Service charges of inspection @ 0.5% (cif) value	67		72	
20. Importer commission @ 1% of c&f cost	77		83	
21. Transport charges from Karachi to Lahore (b) including loading/unloading	154		166	
22. <b>Landed cost at Lahore (item 9+items 10 to 21)</b>	1350		1350	
23. Less sales tax @ 15% on domestic production	27541		29530	
24. <b>Cost of one tonne of imported sugar after deducting sale tax @ 15% of landed cost at Lahore</b>	3592		3852	
	23949		25678	
	Punjab & NWFP	Sindh	Punjab & NWFP	Sindh
25. Processing cost of sugar (c)	8142.67	8142.67	8730.57	8730.57
26. Value of cane to produce one tonne of sugar (item 24 minus item 25)	15806.37	15806.37	16947.57	16947.57
27. Provincial base recovery level (%)	8.50	8.70	8.50	8.70
28. Quantity of cane in tonnes required to produce one tonne of sugar (100 / item 27)	11.76	11.49	11.76	11.49
29. Price of one tonne of sugarcane (item 26 / item 28) (Rs per tonne)	1344.08	1375.66	1441.12	1474.98
30. Price of 40 kgs of cane (Rs per 40 Kgs)	53.76	55.03	57.64	59.00

Sources: i) For average c&f price: Annex -XII  
ii) For freight, incidentals and duties: Trading Corporation of Pakistan, Karachi.

Notes: (a) Worked out at the selling exchange rate of one US \$ = 59.85 Pak rupees, announced by State Bank of Pakistan as on December, 21, 2004.  
(b) Assuming that imported sugar will be consumed at Lahore.  
(c) Ratio of cost of cane to processing cost has been estimated at 66:34 from publication " Cost of Production of Sugar " jointly prepared in 1996 by APCom and Business & Consultancy Services.

**ECONOMIC EXPORT PARITY PRICES OF SUGARCANE AT MILL-GATE AS WORKED BACK  
FROM AVERAGE FOB (LONDON) SUGAR PRICE OF WHITE SUGAR**

Item	1999-00 to 2003-04		2004-05 (Oct-Nov)	
	.... US \$ per tonne ....			
1. Average fob (London) price	227.49		247.81	
	OR ... Rs. per tonne (a)...			
2. Average fob Karachi price ( assuming equivalent to fob London price)	13570		14782	
3. Transport charges from interior Sindh to port, stevedoring ,clearing & forwarding (b)	700		700	
4. Wharfage and weighment charges	43		43	
5. Export development surcharge (EDS) @0.25 % of export price	31		34	
6. Insurance of sugar at godwan @0.5 of export price	63		68	
7. Bank commission @ 1 % of fob price	136		148	
8. Lab analysis charges	25		25	
9. Pre- shipment inspection charges@ 0.5 of fob price	68		74	
10. Mark up on retirement of documents by bank for 60 days @ 12% per annum of c&f cost	268		292	
12. TCP service charges @2% of export price	250		274	
13. Provision for shortage & unforeseen@0.5 of export price				
14. Ex-mill price of sugar ( item 2 minus items 3 through 13)	12504		13689	
	Punjab & NWFP	Sindh	Punjab & NWFP	Sindh
15. Processing cost of sugar (c)	4251.51	4251.51	4654.42	4654.42
16. Value of cane to produce one tonne of sugar (item 14 minus item 15)	8252.94	8252.94	9035.05	9035.05
17. Provincial base recovery level (%)	8.50	8.70	8.50	8.70
18. Quantity of cane in tonnes required to produce one tonne of sugar (100 / item 17)	11.76	11.49	11.76	11.49
12. Price of one tonne of sugarcane (item 16/ item 18) (Rs per tonne)	701.50	718.01	767.98	786.05
13. Price of 40 kgs of cane (Rs per 40 Kgs)	28.06	28.72	30.72	31.44

Sources: i). For average fob (London) price: Annex XII.  
ii) For incidentals and duties: Trading Corporation of Pakistan, Karachi.

Notes: (a) Worked out the buying exchange rate of one US \$ = 59.65 Pak rupees, announced by State Bank of Pakistan as on December, 21, 2004.  
(b) Assuming that the surplus sugar will be exported from Sindh province.  
(c) Ratio of cost of cane to processing cost has been estimated at 66:34 from publication " Cost of Production of Sugar " jointly prepared in 1996 by APCoM and Business & Consultancy Services.

**ECONOMIC EFFICIENCY OF RESOURCE USE IN SUGARCANE PRODUCTION**  
**POLICY ANALYSIS MATRIX (PAM)** Based on import parity prices

Description	Revenues	Traded cost	Domestic Factors Cost	Profits
----- Rupees per acre -----				
<b>PUNJAB</b>				
<b>1999-00</b>				
Private Prices	19393	5034	9399	4960
Social Prices	19516	4684	9180	5652
Transfers	-123	350	219	-692
<b>2000-01</b>				
Private Prices	25309	5070	9662	10377
Social Prices	23612	4714	9583	9315
Transfers	1697	356	279	1062
<b>2001-02</b>				
Private Prices	20239	5946	11337	2956
Social Prices	21692	5030	10972	5690
Transfers	-1453	916	365	-2734
<b>2002-03</b>				
Private Prices	19474	6060	12233	1180
Social Prices	21739	5122	11800	4817
Transfers	-2265	938	433	-3637
<b>2003-04</b>				
Private Prices	19048	6804	12945	-501
Social Prices	21055	5569	12473	3013
Transfers	-2006	1035	472	-3514
<b>2004-05</b>				
Private Prices	22436	7004	13645	1787
Social Prices	24057	5897	13004	5155
Transfers	-1621	1107	641	-3366
<b>Average (1999-00 to 2004-05)</b>				
Private Prices	20983	5953	11670	3360
Social Prices	21945	5169	11169	5607
Transfers	-962	784	502	-2247
<b>SINDH</b>				
<b>1999-00</b>				
Private Prices	28176	7493	10396	10287
Social Prices	24152	7080	10445	6627
Transfers	4024	413	-49	3660
<b>2000-01</b>				
Private Prices	33753	7581	10945	15227
Social Prices	29011	7152	10958	10901
Transfers	4741	429	-13	4325
<b>2001-02</b>				
Private Prices	31556	8543	11760	11253
Social Prices	27163	7493	11666	8004
Transfers	4393	1050	95	3248
<b>2002-03</b>				
Private Prices	23951	8793	12293	2865
Social Prices	23951	7737	12216	-19953
Transfers	23951	1056	77	22819
<b>2003-04</b>				
Private Prices	23444	9323	13418	703
Social Prices	23390	8211	13347	1832
Transfers	54	1112	71	-1129
<b>2004-05</b>				
Private Prices	27839	9703	13638	4497
Social Prices	29101	8510	13596	6995
Transfers	-1262	1193	42	-2498
<b>Average (1999-00 to 2004-05)</b>				
Private Prices	28120	8573	12075	7472
Social Prices	26570	7697	12038	6835
Transfers	1549	876	37	637

ECONOMIC EFFICIENCY OF RESOURCE USE IN SUGARCANE PRODUCTION  
POLICY ANALYSIS MATRIX (PAM)

Based on export parity prices

Description	Revenues	Traded cost	Domestic Factors Cost	Profits
----- Rupees per acre -----				
<b>PUNJAB</b>				
<b>1999-2000</b>				
Private Prices	19393	5034	8939	5420
Social Prices	13284	4265	8764	255
Transfers	6109	769	175	5165
<b>2000-01</b>				
Private Prices	25309	5070	9301	10938
Social Prices	17047	4288	9119	3640
Transfers	8262	781	182	7298
<b>2001-02</b>				
Private Prices	20239	5946	10772	3521
Social Prices	15209	4657	10513	38
Transfers	5031	1289	259	3483
<b>2002-03</b>				
Private Prices	19474	6060	11662	1751
Social Prices	15274	4791	11343	-860
Transfers	4200	1269	319	2612
<b>2003-04</b>				
Private Prices	22439	6626	12307	3506
Social Prices	12504	4914	11921	-4332
Transfers	9935	1712	386	7838
<b>2004-05</b>				
Private Prices	22436	7004	13645	1787
Social Prices	17332	5897	11635	-200
Transfers	5105	1107	2011	1987
<b>Average (1999-00 to 2004-05)</b>				
Private Prices	21548	5957	11205	4387
Social Prices	15108	4802	10549	-243
Transfers	6440	1154	655	4630
<b>SINDH</b>				
<b>1999-2000</b>				
Private Prices	28176	7001	10396	10779
Social Prices	16522	5556	10252	714
Transfers	11654	1446	143	10065
<b>2000-01</b>				
Private Prices	33753	7059	10945	15749
Social Prices	20974	5671	10779	4524
Transfers	12779	1388	166	11225
<b>2001-02</b>				
Private Prices	31556	8312	11760	11484
Social Prices	19225	5175	11276	2774
Transfers	12331	3137	484	8710
<b>2002-03</b>				
Private Prices	23951	8348	12293	3310
Social Prices	18690	6526	12073	90
Transfers	5261	1821	220	3220
<b>2003-04</b>				
Private Prices	23444	8631	13083	1730
Social Prices	15297	6295	12800	-3798
Transfers	8147	2337	283	5528
<b>2004-05</b>				
Private Prices	27839	9703	13638	4497
Social Prices	21549	8510	11588	1452
Transfers	6290	1193	2051	3046
<b>Average (1999-00 to 2004-05)</b>				
Private Prices	28120	8176	12019	7925
Social Prices	18710	6418	11462	830
Transfers	9410	1758	558	7095

ANNEX-XVIIIOFFICE OF THE CANE COMMISSIONER SINDH, BLOCK-B,  
SHAHBAZ BUILDING HYDERABADNo.SCB/1146  
Hyderabad Dated 28/12/04REMINDER-XIVTo,  
The District Coordination Officer  

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SUBJECT: SUGARCANE CESS FUND

Reference:- This office letter No.SCB/1245 dated 29-12-2003 and subsequent reminders No.SCB/40 dated 13-01-2004, No.SCB/159 dated 14-02-2004, No.SCB/270 dated 06-03-2004, No.SCB/383 dated 26-03-2004, No.SCB/436 dated 08-04-2004, No.SCB/527 dated 04-05-2004, No.SCB/630 dated 31-05-2004, No.SCB/696 dated 21-06-2004, No.SCB/774 dated 20-7-2004, No.SCB/828 dated 11-8-2004, No.SCB/877 dated 02-09-2004, No.SCB/956 dated 06-10-2004 and No.SCB/1046 dated 19-11-2004 on the subject cited above.

The required information regarding amounts allocated and spent for the Development of roads for the last three years i.e. 2000-2001 to 2002-2003 has not been received as yet.

Kindly send the same on the prescribed proforma already communicated to you for onward transmission to the Ministry of Food, Agriculture and Livestock, Government of Pakistan.

Top priority may kindly be assigned to this matter.

Sd/  
(NAZAR MOHAMMAD BALOCH)  
CANE COMMISSIONER SINDH

Copy f.w.cs to:-

1. The Secretary to Government of Sindh, Agriculture Department, Karachi
2. The Cane Commissioner, Government of Pakistan, Ministry of Food, Agriculture & Livestock, Islamabad
3. The Chief A.P.D. Agriculture Prices Commission, Islamabad for information

Sd/  
CANE COMMISSIONER

