API SERIES NO.239

SUGARCANE POLICY ANALYSIS FOR 2011-12 CROP

AGRICULTURE POLICY INSTITUTE
MINISTRY OF FOOD AND AGRICULTURE
GOVERNMENT OF PAKISTAN
ISLAMABAD

APRIL, 2011

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXES

LIST ABBREVIATIONS

API	Agriculture Policy Institute
AARI	Ayub Agricultural Research Institute
AJ&K	Azad Jammu and 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
CRS	Crop Reporting Service
CPR	Cane Procurement Receipt
DAP	Di-Ammonium Phosphate
DRC	Domestic Resource Cost
DPV	Duty Paid Value
ECC	Economic Coordination Committee
E&M	Economics & Marketing
EPC	Effective Protection Coefficient
EPB	Export Promotion Bureau
FAO	Food and Agriculture Organization
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
HYVs	High Yielding Varieties
IPM	Integrated Pest Management
ISO	International Sugar Organization
LSD	Light Speed Diesel
MINFAL	Ministry of Food, Agriculture and Livestock
NARC	National Agricultural Research Centre
NAs	Northern Areas
NFDC	National Fertilizer Development Centre
NPC	Nominal Protection Coefficient
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

PART ONE

SUGARCANE POLICY ANALYSIS

FOR

2011-12 CROP

SUGARCANE POLICY ANALYSIS FOR 2011-12 CROP

INTRODUCTION

Sugarcane is the second largest non-food crop after cotton and ranks fourth in respect of acreage, fifth in terms of production and tenth in terms of yield. Despite shortage of water and persistent rise in input prices sugarcane area, yield and production in 2010-11 increased over 2009-10 by 5.8%, 3.0% and 8.8% respectively. However, achievements against targets are not satisfactory for the referred year.

2. Negative growth is registered for area and production of sugarca.e in Sind, KPK and Baluchistan provinces. Sugarcane area and production targets could not be achieved as the growers opted for other cash crops like cotton, maize, onions, vegetables and fruits in place of sugarcane.

3. Sugar production in 2010-11 is estimated at 3.8 million tonnes against 3.1 million tonnes produced in 2009-10 but it is still less than 4.7 million tonnes produced in 2007-08 that is why country imported 758 thousand tons sugar in 2010-11 as reported by FBS in March 2011. Closing stocks declined from 1.2 million tonnes to zero in 2010-11. Domestic industry fulfilled the domestic consumption requirement of 4.2 million tonnes in 2007-08 but during the current year industry may not be able to fulfill local demand. There are many factors behind this demand supply gap situation.

4. Of late there has been confrontation between growers and millers over price. Growers demand higher price for their produce and millers complain about increase in the cost of production of sugar. One of the main reasons of this confrontation is late start of the crushing season which inflicts financial loss to both farmers and sugar manufacturers. Other problems are stagnant cane yield level, unsatisfactory procedure of payment to growers by mills and low import parity price of sugar. Some of the other constraints faced by the growers in disposal of their produce are under-weighing of cane at purchase centers and factory gates, undue deductions by mills up to 10 per cent, delay in payment to growers by the sugar mills, excessive charges of the middlemen involved in marketing of sugarcane, difficult achievement of indent and problem in payment of premium. It is revealed through the field surveys that transporters particularly trolley owners also exploit mill owners by demanding additional Rs 250-300 per trolley when cane is short. Delay in unloading at the mill gate incurs additional Rs 100 per trolley per day in addition to charges for food and tea to trolley drivers by the mills. Among economic factors unjustified marketing margins attributed to different intermediaries performing between the raw material producers and ultimate consumers also accentuates the situation. It is revealed in the field surveys and research that only 35 percent of the cost goes to farmer, 24 per cent to the government in taxes, 21 percent to miller, 9 percent to wholesalers and 6 percent to retailers respectively.

5. Currently domestic sugar production has fallen short of local demand leading to import of sugar. Besides other factors, increased cost of production of sugarcane due to increased cost of inputs has added to the cost of sugar manufacturing but currently extremely high price of sugar is not fully justified in terms of increase in raw material cost. As it is

generally observed that small shortage in cane supply relatively causes more proportional increase in sugar price.

6. On the other hand, import of sugar poses threats to local industry and growers. The indicative price is an important determinant of sugarcane production. It affects investment in sugarcane crop i.e. encourages or discourages technology. Indirectly it also bears on industry's demand for cane as the volume of sugar production is mainly related to production, milling capacity of the unit and prices of gur and other by-products.

7. Although, government plays significant role for stabilizing the market but deficient domestic sugar production, static yield level and weaknesses in existing regulations are some significant problems encountered to the industry and farmers and call for appropriate solutions.

8. Though during 2010-11 government timely intervened by importing sugar and controlling retail distribution below the market price through utility stores but purchasing of excess stocks from the sugar mills disturbed the market.

9. The situation calls for a level playing field by easing the tax burden on sugar manufacturing and the grower community. The sugar sector needs government attention in the form of facilitative measures.

10. This document entails a comprehensive background and economic analysis of all the possible factors impacting the likely policy options. These include: optimum planting times; majorcane producing districts; cost of production of sugarcane with major contributing inputs; Market price of sugarcane and sugar; Parity prices estimated from domestic and international prices of sugar; Efficiency of domestic resource use in sugarcane enterprise; Ranking among crops; Marketing and productivities issues of sugarcane crop. The analysis of these factors and the issues as entailed in this report may provide the workable policy options to the provincial governments.

2. SUGARCANE PLANTING AND HARVESTING SEASONS

11. Sugarcane, is a tropical crop which requires temperature of more than 20C° 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 for sugarcane from 8 to 10 months in a year. Recommended times of planting spring and autumn crops of sugarcane by province are given in Table-1.

Table - 1 Planting Time 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 15th October
KPK	15th February to 3rd week of March	September

Source: Sugarcane Coordinator, NARC, Islamabad.

3. IMPORTANT SUGARCANE PRODUCING DISTRICTS OF PAKISTAN

12. 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, R.Y. Khan, Jhang, Sargodha, T.T. Singh, Kasur, Muzaffargarh, M.B. Din, Nankana Sahib, Okara, Vehari, Bahawalnagar, Bhakkar, Bahawalpur, Rajanpur, Layyah, Sahiwal, Khanewal, Khushab, Hafizabad, Pakpattan, Mianwali, D.G. Khan, Sheikhupura, Multan and Gujrat in the Punjab; Hyderabad/T. M. Khan/T. A. Yar, Badin, Thatta, Nawabshah, N. Feroze, Khairpur, Mirpurkhas/Umarkot, Matiari, Sanghar, Ghotki, Dadu and Sukkur are in Sindh; Charsadda, Mardan, D. I. Khan, Peshawar, Nowshera, Malakand and Swabi are in KPK. These 45 districts; 26 from the Punjab, 12 from Sindh and 7 from KPK collectively account for 99 per cent of the sugarcane area and production (Annex-I).However Faisalabad, R.Y. Khan, Jhang Sargodha, T. T. Singh, Kasur, Hyderabad, Badin, Charsadda and Mardan collectively produce 60 per cent of the total sugarcane produced in the country. Annex I.

4. PROVINCIAL SHARE IN AREA AND PRODUICTION OF SUGARCANE

13. Provincial shares in area and production of sugarcane have been worked out on the basis of three years average of 2007-08 to 2009-10 and changes therein are mentioned in Table 2. Punjab, Sindh and KPK share are 65.4, 25.1, and 9.5 percent in area and 63.6, 27.9, and 8.5 percent are in production. The share of Baluchistan is negligible. Share of Sindh exceeds in Production in relation to area due to cultivation of September sown crop which has more yield.

Table 2. Provincial share in Area and Production of Sugarcane

Country/Province	Area		Production	
	000 ha	Percent	Million tones	Percent
Pakistan	1071.3	100.0	54.4	100.0
Punjab	700.4	65.4	34.6	63.6
Sindh	468.9	25.1	15.2	27.9
KPK	101.3	9.5	4.6	8.5
Baluchistan	0.7	-	0.03	-

Source: Agriculture Statistics of Pakistan, MINFA

5. CHANGES IN AREA, YIELD AND PRODUCTION

14. During the decade ending 2010-11, area under sugarcane at country level ranged between 907.5 to1241.3 thousand hectares, production from 44 to 64 million tonnes and yield oscillated between 45 to 53 tonnes per hectare. Long-term and short-term changes in area, yield and production of sugarcane are discussed in the following paragraphs: For statistics Annex II may be seen.

5.1 Long-term Changes: 2000-01 to 2010-11

15. During the decade ending 2010-11, sugarcane production increased in the country @ 1.41 per cent per annum mainly due to improvement in yield @ 1.32 per cent. Sugarcane area, however, expanded just negligibly @ 0.09 per cent per annum (Table-3).

16. It is indicated in Table-3 that sugarcane production in the Punjab during the period under consideration increased @ 1.67 percent per annum due to 1.43 per cent improvement in yield and 0.24 per cent expansion in area. Sugarcane production in Sindh increased @ 1.75 per cent mainly due to 1.73 per cent improvement in yield. In the KPK sugarcane production declined @ 1.30 per cent per annum due to decrease both in area and yield. In Baluchistan, in spite of annual increase in yield @ 0.40 percent, production decreased @ 0.80 percent which is due to decrease in area @ 0.65 percent.

Table –3 Average Annual Growth Rate of Area, Yield and Production of Sugarcane: 2000-01 to 2010-11

Country/ Province	Area	Yield	Production
	....................Percent per annum...........................		
Pakistan	**(+) 0.09**	**(+) 1.32**	**(+) 1.41**
Punjab	(+) 0.24	(+) 1.43	(+) 1.67
Sindh	(+) 0.02	(+) 1.73	(+)1.75
KPK	(-) 0.90	(-) 0.40	(-) 1.30
Balochistan	(-) 0.65	(+) 0.40	(-) 0.80

Note: The growth rates have been worked out by estimating the equation, Y=(1+r)n, through ordinary least square method (OLS) from the data given in Annex-II.

5.2 Short-term Changes: 2009-10 and 2010-11 Crops

17. According to the second estimates of Provincial Agriculture Departments, sugarcane production at country level for 2010-11 crop is reported at 53.7 million tonnes reflecting an increase of 8.8 percent over last year's crop of 49.4 million tonnes. The rise in production is shared by 5.8 percent expansion in area and 3 per cent rise in yield (Table-4).

Table – 4 Area, Yield and Production of Sugarcane: 2009-10 and 2010-11 Crop

Country/ Province	Area 2009-10	Area 2010-11	Change %	Yield 2009-10	Yield 2010-11	Change %	Production 2009-10	Production 2010-11	Change %
	000 ha			Tonne			000 tonne		
Pakistan	942.8	997.9	(+) 5.8	52.37	53.94	(+) 3.0	49372.9	5373.7	(+) 8.8
Punjab	607.4	675.0	(+)11.1	51.57	53.39	(+) 3.5	31324.0	36038.9	(+)15.1
Sindh	233.9	226.5	(-) 3.2	57.74	59.41	(+) 2.9	13505.4	13456.5	(-) 0.4
KPK	100.8	95.8	(-) 5.0	44.72	44.72	(+) 0.0	4507.9	4211.5	(-) 6.6
Balochistan	0.7	0.6	(-)14.3	50.86	51.33	(+) 0.9	35.6	30.8	(-)13.5

Source: Annex-II

18. Provincial Agriculture Departments of the Punjab, Sindh, KPK and Baluchistan have provided following reasons for increase/decrease in area and production of sugarcane.

19. In Punjab, area estimate of the sugarcane crop for the year 2010-11 stands at 675.0 thousand hectares against 607.4 thousand hectares in the last year and production at 36038.9 thousand tonnes compared with 31324.0 thousand tonnes of the previous year. The area figure shows an increase of 11.1 percent which is due to lucrative market prices of last year while production shows an increase of 15.1 percent attributable to corresponding increase in area. In Sindh, area figure shows a decrease of 3.2 percent which is due to last year's heavy floods in the river Indus and breaches in canals. Consequently production decreased @ 0.40 percent. In KPK, the area shows a decrease of 5.0 percent and production 6.6, respectively. In Baluchistan, area and production both show decrease of 14.3 and 13.5 percent, respectively.

5.3 TARGETS VS ACHIEVEMENTS: 2010-11 CROP

20. FCA (Federal Committee on Agriculture) had fixed sugarcane production target for 2010-11 crop at 53.69 million tonnes. As per second estimates of Provincial Agriculture Departments, sugarcane production is reported at 53.74 million tonnes showing an increase of 0.1 percent. This 0.1 percent production increase over the target is due to increase in yield by 7.7 percent. The production in Punjab increased by 6.5 percent due to increase in yield by 11.2 percent as indicated in Table-5. The production in Sindh and KPK declined due to shrink in area.

Table–5 Targets and Estimated Achievements of Area, Yield and Production of Sugarcane: 2010-11 Crop

Country/ Province	Area		Deviation from the target	Yield		Deviation from the target	Production		Deviation from the target
	Target	Achiev e-ment		Target	Achieve-ment		Target	Achieve-ment	
	--- 000 ha ----		Per cent	Tonnes/ha		Per cent	-- 000 tonnes --		Per cent
Pakistan	1069	997.9	(-) 7.2	50	53.9	(+) 7.7	53690	53737.7	(+) 0.1
Punjab	698	675	(-) 3.4	48	53.4	(+)11.2	33846	36038.9	(+) 6.5
Sindh	269	226.5	(-)18.8	56	59.4	(+) 6.1	15170	13456.5	(-)11.3
KPK	102	95.8	(-) 6.5	46	44.0	(-) 4.4	4641	4211.5	(-) 9.3

Sources:
- For targets, Working Paper of the 73 Meeting of FCA.
- For achievements second estimate released by MINFA.

6. DOMESTIC AND GLOBAL SUGARCANE YIELD GAP

21. Table-6 gives a comparison of Pakistan's sugarcane yield level with other sugar producing countries. The data in Table-5 indicate that Pakistan is the fifth largest sugarcane cultivating country but in terms of yield it is at the lowest level by producing only 47 tons of cane per hectare. In terms of sugar yield, Pakistan and Cuba are almost at par by producing 3.9 and 3.1 tons per hectare respectively. For yield all other fourteen countries are above Pakistan.

Table - 6 Major Sugarcane and Sugar Producing Countries

S. No.	Name of country	Cane Harvested Area	Cane Yield Ton./ Hect	Sugar Yield Ton./ Hect
1	Brazil	2439	58	8.3
2	China	1299	61	6.4
3	Cuba	1030	33	3.1
4	India	2581	71	7.9
5	Pakistan	848	47	3.9
6	Thailand	992	61	6.6

Source: International Sugar Organization, International Survey Report of Sugar Crop Yield

7. SUGARCANE CRUSHED AND SUGAR PRODUCED IN PAKISTAN

22. Table 7 given below gives a picture of sugarcane produced and crushed by sugar mills which shows that maximum utilization of sugarcane in Pakistan is 82.6 percent in 2007-08. This is due to the fact that this year cane production was also highest. As a result sugar

produced production of sugar was maximum but due to unknown factors sucrose recovery was not as much as recorded during the few years back. These statistics prove that if crop size is good country mills have the capacity to produce more sugar as per required for the consumption even Pakistan can export sugar but again it depends on the crops situation in the country.

Table – 7 Sugarcane Crushed and Sugar Manufactured in Pakistan

Year	Cane Produced	Cane Crushed	Utilization	Sugar Produced	Recovery	No. of Mills
2000-01	43.620	29.409	67.47	2.467	8.39	65
2001-02	48.041	36.709	76.33	3.198	8.71	69
2002-03	52.049	41.787	80.28	3.653	8.74	71
2003-04	53.800	43.661	81.19	3.997	9.15	71
2004-05	43.533	32.102	73.74	2.922	9.10	71
2005-06	44.292	30.091	67.94	2.588	8.60	74
2006-07	54.871	40.484	73.78	3.516	8.69	77
2007-08	63.920	52.777	82.60	4.741	8.98	78
2008-09	50.045	33.139	66.21	3.134	9.46	82

Source: Pakistan Sugar Mills Associations (PSMA)

8. FACTORS CONSIDERED FOR PRICE POLICY OPTIONS

8.1 Cost of Production of Sugarcane

23. Cost of production (COP) is one of the important considerations in formulating price proposals for farm produce. However, its empirical estimation involves problems and practical impediments on account of wide variations in agro-climatic conditions and farming systems under which a crop is grown. In case of sugarcane, the problem is even more complicated because the crop is sown twice -- spring and autumn sowings, a year. Each sowing has different duration and farming practices which requires varying use of inputs and yield level.

24. Cost of production (COP) of sugarcane for the 2011-12 crop of Punjab, Sindh and Khyber Pakhtunkhwa is calculated on the basis of selected COP parameters. There are two types of inputs for the sugarcane crop. One category comprises physical inputs and the other consists of different machinery and labour operations. Expenditure estimates of physical inputs are derived by using latest market prices. Machinery and labour operations are evaluated by using custom hire rates collected from the field. These rates were collected through mini field survey held in January 2011 in major sugarcane producing areas of the Punjab, Sindh and KPK provinces. The inputs' prices and custom hiring rates were discussed in the API Standing Committee Meeting on sugarcane, held on 12th February 2011 at Islamabad and on 5th March 2011at Hyderabad and supplemented with the information supplied by the representatives of Provincial Agriculture Departments and Farmers' Associations in the above cited Meetings. The detailed cost estimates are presented in Annex III to V, while summary of the results is given in Table-8.

Table - 8 Average Farmer's Cost of Production of Sugarcane in Different Provinces: 2010-11 and 2011-12 Crops

Item	Unit	Cost estimate		Net increase in 2011-12 over 2010-11
		2010-11 crop	2011-12 Crop	
Punjab				
1. Cost of cultivation	Rs/acre	54123	72227	18104
2. Yield	40 kgs/acre	565.15	565.15	-
3. Cost of production at farm level	Rs/40 kgs	95.77	127.80	32.03
4. Marketing cost	"	10.25	12.25	2.00
5. Cost of production at mill-gate	"	106.02	140.05	34.03
Sindh				
1. Cost of cultivation	Rs/acre	64988	84094	19106
2. Yield	40 kgs/acre	676.02	676.02	-
3. Cost of production at farm level	Rs/40 kgs	96.13	124.40	28.27
4. Marketing cost	"	10.32	12.32	2.00
5. Cost of production at mill-gate	"	106.45	136.72	30.27
KPK				
1. Cost of cultivation	Rs/acre	52625	74589	21964
2. Yield	40 kgs/acre	585.46	585.46	-
3. Cost of production at farm level	Rs/40 kgs	89.89	127.40	37.51
4. Marketing cost	"	10.27	12.27	2.00
5. Cost of production at mill-gate	"	100.16	139.67	39.51

Source: Annex III to V.

Punjab

25. As per detail given in Annex-III and summarized in Table-7, cost of cultivating one acre of sugarcane in Punjab during 2011-12 crop season is expected to be Rs 72227, including land rent. Thus cost of production at farm level works out to Rs 127.80 per 40 kg based on the average yield of 565 maunds (40 kgs) per acre. Adding up marketing expenses and sugarcane development cess @ Rs 12.25 per 40 kgs, cost of cane at mill-gate would be Rs 140.05 per 40 kg, indicating an increase of Rs 34.03 (32.10 per cent) over the corresponding cost estimates of Rs 106.02 for the last year.

Sindh

26. Cost of cultivation of sugarcane in Sindh for 2011-12 crop is likely to be Rs 84094 per acre, including land rent. Farm level cost of production of sugarcane is anticipated at Rs 124.40 per 40 kgs, based on an average yield of 676 maunds per acre. Accounting for marketing expenses including sugarcane development cess @ Rs 12.32 per 40 kgs, the mill-gate cost of production is expected to be Rs 136.72 per 40 kgs higher by Rs 30.27 (28.43 per cent) over the last year corresponding cost estimates of Rs 106.45 (Annex IV).

KPK

27. In view of rising prices of inputs, cost of sugarcane cultivation (including land rent) in KPK for 2011-12 crop is expected at Rs 74589 per acre. Based on average yield of 585 maunds (40 kgs) per acre, cost of production at farm level works out Rs 127.40 per 40 kgs. Adding marketing expenses @ Rs 12.27 per 40 kg and sugarcane development cess, the mills-gate cost comes to Rs 139.67 which reflects an increase of Rs 39.51 over the last year's corresponding cost of Rs 100.16 per 40 kgs. Details are given in Annex-V. The most

significant causes of escalation in the cost of production of sugarcane for the 2011-12 crop year in the Punjab, Sindh and KPK are atypical upsurge in the land rentals on account of high prices of sugarcane in the season and unexpected increases in the prices of fertilizers. Moreover, higher cost of seed, rising custom hire rates of different farm operations, increase in price of diesel and power tariff adding to irrigation costs and wage rates have also added substantially in the cost of production of sugarcane..

8.2 Cost of major operations/inputs

28. The shares of major farm operations and farm inputs in the total cost of cultivation of sugarcane for 2010-11 and 2011-12 crops in the Punjab, Sindh and KPK are presented in the Table - 9.

Table – 9 Cost of major operations/ inputs of Sugarcane for 2010-11 and 2011-12 Crops

Operation/ input	2010-11 crop	2010-11 crop	Percent share in the increased cost
	Rs/acre		%
Punjab			
1. Land preparation	5258 (10)	6476 (9)	6.7
2. Seed and sowing operations	6328 (11)	7145 (10)	4.5
3. Interculture and earthing-up	1447 (3)	1704 (2)	1.4
4. Plant protection	243 (1)	259 (1)	0.1
5. Irrigation	6348 (12)	7178 (10)	4.6
6. Fertilizer including FYM	7428(14)	10698(15)	18.1
7. Land rent	13000 (24)	21667(30)	47.9
8. Harvesting and stripping	6994 (13)	6994 (10)	-
9. "Others"	7077 (12	10106 (13)	16.7
10. Total cost	54123 (100)	72227 (100)	**100.0**
Sindh			
1. Land preparation	6286 (10)	7748 (9)	7.7
2. Seed and sowing operations	11280(16)	12906(15)	8.5
3. Intercultural and earthing-up	2709 (4)	3320 (4)	3.2
4. Plant protection	326 (1)	338 (1)	0.1
5. Irrigation	2823 (4)	3255 (4)	2.3
6. Fertilizer including FYM	10184 (16)	14810 (19)	24.2
7. Land rent	13333 (21)	20000 (24)	34.8
8. Harvesting and stripping	8450 (13)	8450 (10)	-
9. "Others"	9597 (15)	13267 (15)	19.2
10. Total cost	64988 (100)	84094 (100)	**100.0**
KPK			
1. Land preparation	2901 (6)	3647 (5)	3.4
2. Seed and sowing operations	9002 (17)	11636 (16)	12.0
3. Intercultural and earthing-up	2826 (5)	3483 (5)	3.0
4. Plant protection	372 (1)	407 (1)	0.2
5. Irrigation	4058 (8)	4610 (6)	2.5
6. Fertilizer including FYM	6976 (13)	9756 (13)	12.7
7. Land rent	18125 (34)	30000 (40)	54.2
8. Harvesting and stripping	1683 (3)	1683 (2)	-
9. "Others"	6682 (13)	9367 (12)	12.2
10. Total cost	52625 (100)	74589 (100)	**100.0**

Notes:
- "Others" include mark-up, management, land tax, drainage cess and expected escalation in the cost of selected items.
- Figures in parenthesis are percent shares in total cost.
- Rounding off figures may result in slight differences.

Punjab

29. Land rent is the main constituent of the cost of cultivation. It contributes 30 per cent to the gross cost. Other major constituents are fertilizer (including FYM), seed & sowing operations, irrigation and harvesting and stripping and different items taken cumulatively under the heading 'others'. Fertilizer cost is 15%, seed & sowing operations 10%, irrigation and harvesting and stripping again 10% and "other items" 14% of the total cost of production of sugarcane.

Sindh

30. Major components of the cost of cultivation of sugarcane in Sindh during 2011-12 crop year are land rent (24 %), fertilizer including FYM (19 %), 'others' (15 %), seed and sowing operations (15 %), harvesting and stripping (10 %) and land preparation (9 %).

KPK

31. During 2011-12 crop year, major constituents of cost of cultivation of sugarcane in KPK are land rent (40%), seed and sowing operations (16 %), fertilizer including FYM and others (13 % each), land preparation and inter culture (5 % each).

8.3 Prices of major farm inputs

32. Prices of major farm inputs used in calculation of the cost of production of sugarcane for the 2010-11 and 2011-12 crops are given in Table-10. It is reflected from the Table 10 that highest increase has been registered in the prices of DAP and Urea fertilizers, then High speed diesel and lastly in the prices of seeds and power tariffs and this is true for all three provinces where sugarcane is cultivated.

Table – 10 Prices/ Rates of Major Farm Inputs

Items	Units	2010-11 crop	2011-12 crop	% change
Punjab				
1. HSD	Rs/litre	73.55	93.03	26.49
2. Power tariff	Rs/kwh	4.75	5.31	11.79
3. DAP	Rs/bag	2663	4067	52.72
4. Urea	Rs/bag	793	1179	48.68
5. Seed	Rs/40 kgs	170	190	11.76
Sindh				
1. HSD	Rs/litre	73.55	93.03	26.49
2. Power tariff	Rs/kwh	4.75	5.31	11.79
3. DAP	Rs/bag	2610	4042	54.87
4. Urea	Rs/bag	795	1189	49.56
5. Seed	Rs/40 kgs	170	190	11.76
KPK				
1. HSD	Rs/litre	73.55	93.03	26.49
2. Power tariff	Rs/kwh	4.75	5.31	11.79
3. DAP	Rs/bag	2600	4000	53.85
4. Urea	Rs/bag	815	1190	46.01
5. Seed	Rs/40 kgs	190	250	31.58

9. NOMINAL AND REAL INDICATIVE AND MARKET PRICES OF SUGARCANE: 2000-01 TO 2010-11

33. The nominal and real prices of sugarcane for the period 2000-01 to 2010-11 are described in Table-11 and depicted in Fig-1 and Fig-2.

Table – 11 Nominal and Real Indicative Prices and Market Prices of Sugarcane Realized by the Sugarcane Growers in Punjab: 2000-01 to 2010-11

Crop year	Nominal Prices		Consumer Price Index (CPI)	Real Prices	
	Indicative *	Market**		Indicative	Market
	---- Rs per 40 kgs ----		2000-01=100	---- Rs per 40 kgs ----	
	2	3	4	5=(2/4)x100	6=(3/4)x100
2000-01	35	45	100.00	35.00	45.00
2001-02	40	37	103.54	38.63	35.73
2002-03	40	35	106.75	37.47	32.79
2003-04	40	34	111.63	35.83	30.46
2004-05	40	40	121.98	32.79	32.79
2005-06	45	60	131.18	34.30	45.74
2006-07	60	60	141.87	42.29	42.29
2007-08	60	60	158.90	37.76	37.76
2008-09	80	100	191.90	41.69	52.11
2009-10	100	150	212.44	47.07	70.61
2010-11	125	175	244.84	51.05	71.48

Notes:
* Indicative price of sugarcane at mill-gate fixed by the Provincial Government.
**Prices of sugarcane actually realized by the growers reported during API field survey.
Source:
- Economic Survey of Pakistan: 2009-10.
- Various issues of Price Policy Papers of Sugarcane.

9.1 Nominal and Real Indicative and Market Prices of Sugarcane in Punjab

34. Nominal indicative price of sugarcane in Punjab during the period 2000-01 to 2010-11 reflect an increase of 257 per cent from Rs 35 per 40 kg in 2000-01 to Rs 125 in 2010-11. During the same period, Consumer Price Index (CPI) increased by 145 per cent. Consequently, real indicative price of sugarcane in 2010-11 works at Rs 51.05 per 40 Kg which shows a rise of 42 per cent over the real indicative price of Rs 35 in 2000-01. Real indicative price during the reference period fluctuated between Rs 33 in 2004-05 and Rs 51.05 per 40 Kg in 2010-11.

35. Nominal market price of sugarcane also shows a significant increase over the base year from Rs 45 per 40 kgs in 2000-01 to Rs 175 in 2010-11. For the 145 per cent escalation in cumulative CPI, real market price of the crop turns out at Rs 71.48 in 2010-11, showing an improvement of 59 per cent over the base year.

36. It may be noted that the market price remained above the indicative price announced by the Punjab Government throughout the reference period except 2001-02 to 2003-04 (Table - 10). During 2010-11, the nominal market price in Punjab averaged at Rs 175 per 40 kgs which was 17 per cent above the last year price. Thus 2010-11 price increased by 1 per cent against the 2009-10 price.

Fig-1 Nominal and Real Indicative Prices of Sugarcane Realized by the Growers in Punjab during 2000-01-2010-11

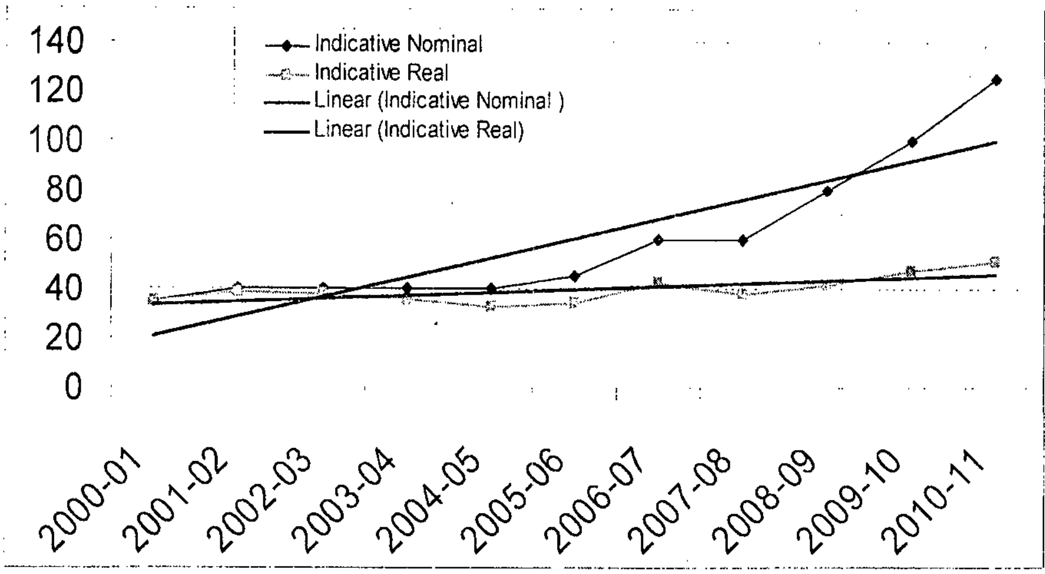
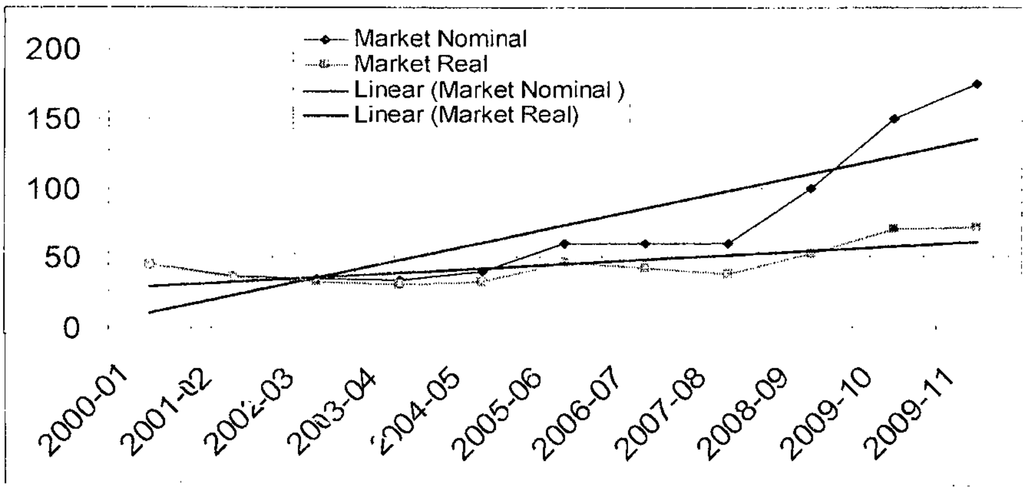


Fig-2 Nominal and Real Market Prices of Sugarcane Realized by growers in Punjab during 2000-01-2010-11



9.2 Nominal and Real Indicative and Market Prices of Sugarcane in Sindh

37. The nominal and real indicative and market prices of sugarcane in Sindh for the period 2000-01 to 2010-11 are set out in Table-12 and also shown in figures 3 and 4.

Table – 12 Nominal and Real Indicative Prices and Market Prices of Sugarcane Realized by the Growers in Sindh: 2000-01 to 2010-11

Crop year	Nominal Prices		Consumer Price Index (CPI)	Real Prices	
	Indicative *	Market **		Indicative	Market
	---- Rs per 40 kgs ----		2000-01=100	---- Rs per 40 kgs ----	
1	2	3	4	5=(2/4)x100	6=(3/4)x100
2000-01	36	50	100.00	36.00	50.00
2001-02	43	47	103.54	41.53	45.39
2002-03	43	36	106.75	40.28	33.72
2003-04	41	35	111.63	36.73	31.35
2004-05	43	41	121.98	35.25	33.61
2005-06	60	60	131.18	45.74	45.74
2006-07	67	67	141.87	47.23	47.23
2007-08	67	67	158.90	42.16	42.16
2008-09	81	100	191.90	42.21	52.11
2009-10	102	160	212.44	48.01	75.32
2010-11	125	185	244.84	51.05	75.56

Notes:

* Indicative price of sugarcane at the mill gate fixed by the Provincial Government

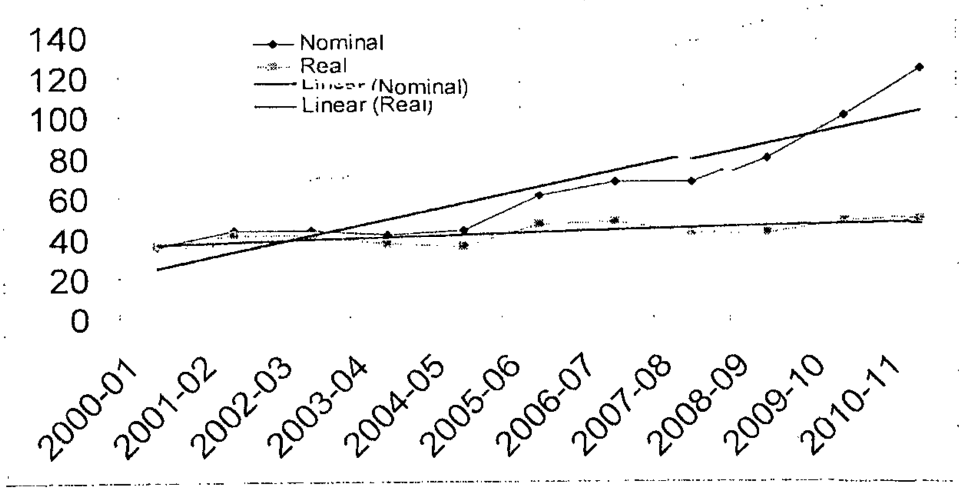
** Prices of sugarcane actually realized by the growers collected through the API field survey

Source:

- Economic Survey of Pakistan: 2009-10.
- Various issues of Price Policy Papers for Sugarcane.

38. The nominal indicative price of sugarcane in Sindh during the period 2000-01 to 2009-10 has reflected a cumulative increase of 247 per cent from Rs 36 per 40 kgs in 2000-01 to Rs 125 per 40 kgs in 2010-11. During the same period, the cumulative CPI has risen by 145 per cent. Consequently, the real indicative price of sugarcane for 2010-11 at Rs 51.05 per 40 kgs showed a surge of 42 per cent over 2000-01 crop. The real indicative price of sugarcane during the period has experienced ups and downs, touching the lowest level of Rs 35 per 40 kgs in 2004-05 and the highest level of Rs 51.05 per 40 kgs in 2010-11 crop.

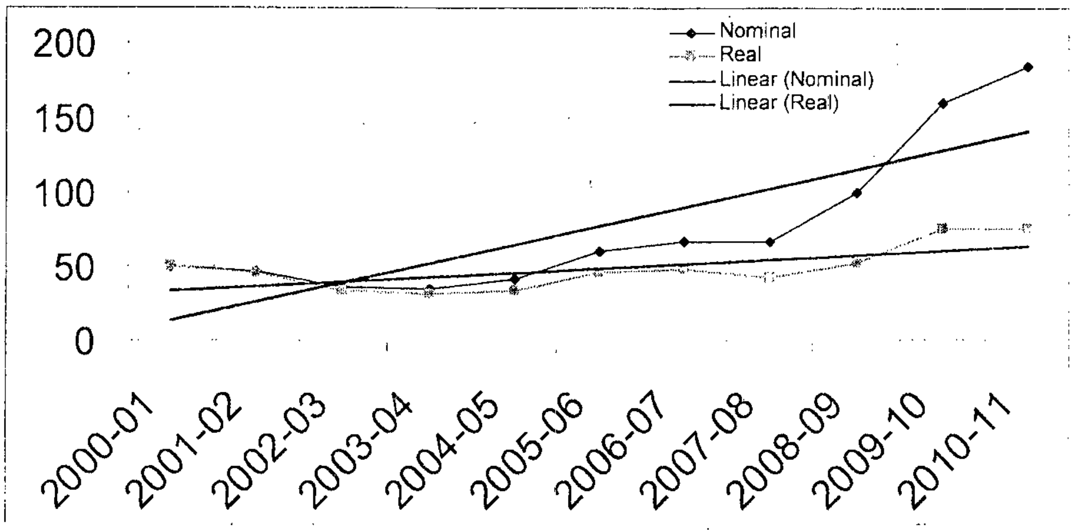
Fig-3 Nominal and Real Indicative Prices of Sugarcane Realized in Sindh



39. Average nominal market price (of main sugarcane producing districts of Sindh) Rs 50/ 40 Kg for the year 2000-01 rose to Rs 185/ 40 Kg during 2010-11. It indicates an overall increase of 270% during the reference period. During the same period, cumulative CPI increased by 145 per cent. Consequently, the real market price of sugarcane in the Sindh province reached at Rs 75.56 per 40 kgs in 2010-11 which shows an improvement of 51 per cent over the base year. During the period under study real market prices of sugarcane occasionally fluctuated but remained below the base year level, except during last three years i.e 2008 through 2011.

40. It may be noted that market prices remained below the prices announced by the Government of Sindh during 2002-03 to 2004-05 which adversely affected the real income of the growers. For 2010-11 the nominal market prices of sugarcane have averaged at Rs 185 per 40 kgs, 48 per cent above the indicative price, and the highest market price during the period under review.

Fig – 4 Nominal and Real Market Prices of Sugarcane Realized by the Growers in Sindh: 2000-01 to 2010-11



10. DOMESTIC DEMAND, SUPPLY, STOCK AND PRICES OF SUGAR

10.1 Domestic demand, supply and stocks

41. Sugar production from 2010-11 sugarcane crop is estimated at 3.4 million tones. Adding 334 thousand tones of leftover stocks from 2009-10, total sugar supply for 2010-11 consumption year is estimated at 3.73 million tons. Based on average per capita availability of sugar estimated at 23.42 kgs during 2007-10, (Annex VI) total domestic requirement for a population of 180.21 million has been worked at 4.22 million tons for 2010-11. Hence there is an estimated shortfall in sugar supply to the tune of 0.49 million tons. Hence there is need to ensure around half million tons of sugar by the private sector either from local or abroad.

10.2 Behaviour of sugar prices in domestic market

42. The monthly average wholesale prices of sugar in major domestic markets during 2010 and 2011 (Jan - Feb) are given in Annex -VII and for the last 10 years in Annex -VIII.

These prices indicate an upward trend during the period under review averaging at Rs 6810 per 100 kgs in 2010. However, price of sugar slightly decreased during 2011 averaging at Rs 6569 per 100 kgs.

11. WORLD SUPPLY, DEMAND, STOCKS, TRADE AND PRICE OF SUGAR

11.1 Supply, demand, stocks and trade

43. Data on world balance sheet of sugar (raw equivalent) for the period of 2008-09 to 2009-10 and forecast for 2010-11 are presented in Table-13.

Table – 13 World Balance Sheet of Sugar (Raw Equivalent): 2008-09 to 2010-11 (Oct-Sept)

S. No	Item	2008-09	2009-10 (Estimated)	2010-11 (Forecast)	Change in 2010-11 over 2009-10
		------- Million tonnes --------			Per cent
1.	Opening stocks	69.84	59.818	58.799	- 1.7
2.	Production	150.020	160.569	168.045	+ 4.7
3.	Total supply (1+2)	219.860	220.387	226.844	+ 2.9
4.	Disappearance (consumption)	160.309	164.549	167.849	+ 2.0
5.	Stock Adjustment *	0.267	(-)2.961	0.009	-
6.	Ending stocks (3-4(+/-)5)	59.818	52.877	59.004	+11.6
7.	Trade (export)	46.25	53.023	50.496	- 4.8
8.	Trade (import)	46.68	53.393	50.309	- 5.8

Note: * Including adjustment for unknown net trade.
Source: Quarterly Market Outlook, ISO, February, 2011

44. The world sugar production is estimated at 160.569 million tones during 2009-10 which is 10.6 million tons (7 %) higher that the last year level of 150.020 million tons. Adding the opening stocks of 59.818 million tonnes, global supply of sugar in 2009-10 was reported at 220.387 million tones (0.24 per cent) higher than the 2008-09 supply. World consumption in 2009-10 is 2.66 per cent higher than the last year. End year stocks in 2009-10 are estimated at 52.877 million tones.

45. World sugar production during 2010-11 is forecast at 168.045 million tones, at record level of 4.7 percent higher that the last year production. Adding the opening stocks of 58.799 million tones, global supply of sugar in 2010-11 is forecast at 226.844 million tones which is 6.5 million tones higher than the 2009-10 level. The world consumption in 2010-11 is projected at 2 per cent higher than the last year figure. End year stocks in 2010-11 are projected to slightly increase to 59.004 million tones.

11.2 International Prices of Sugar

46. The international prices of raw (fob Caribbean ports) and white (fob London) sugar from 2000-01 to 2010-11 are presented in Annex-IX.

12. IMPORT AND EXPORT PARITY PRICE OF SUGARCANE

46. Estimation of import parity price of a commodity is helpful in determining the opportunity cost of resources used in its domestic production while the export parity prices are helpful in ascertaining its competitiveness in international market. Since Pakistan has been

occasional importer/ exporter of sugar, as such both import and export parity prices of sugarcane have been worked out for analyzing price policy options for the next season crop. Both the import and export parity prices have been calculated on the basis of white sugar price (fob London). Detailed calculations in this connection are given in Annex-X and XI, while the results are summarized in Table-14.

Table-14 Import/ Export Parity Price of Sugarcane as Worked Back from Average fob (London) Price of Sugar

Average fob London price of white sugar per tonne	Sugarcane price (Rs/40 kgs)	
	Punjab	Sindh
Import parity		
US $ 755.95 (February 2011)	236.96	255.30
US $ 735.23 (Oct 2010 to Feb 2011)	230.24	248.32
US $ 445.56 (2007-08 to 2009-10)	140.22	150.69
Export parity		
US $ 755.95 (February, 2011)	197.97	213.32
US $ 735.23 (Oct 2010 to Feb 2011)	191.78	206.61
US $ 445.56 (2007-08 to 2009-10)	105.30	112.83

Source: Annex-XI and XIII

13. MILL GATE PRICE OF SUGARCANE BASED ON DOMESTIC WHOLESALE PRICE OF SUGAR FOR 2010-11 CONSUMPTION YEAR

47. Sugarcane prices are also estimated under different scenarios by assuming different wholesale prices of sugar for 2010-11 (consumption year) and are presented in Table-15. This analysis is based on actual sucrose recovery reported by Pakistan Sugar Mills Association (PSMA), processing cost of sugar (ascertained from various meetings of PSMA and MINFA), export price of molasses reported by the Federal Bureau of Statistics (FBS) and General Sales Tax of Rs 2.31 per Kg of sugar. Based on these parameters prospective price of sugarcane is estimated and presented in Table - 14. Relevant details of these estimates are given in Annex-XII.

Table – 15. Expected Price of Sugarcane Estimated at Different Levels of Wholesale Price of Sugar for 2010-11

Wholesale price of sugar (Rs /Tonne)	Expected sugarcane price (Rs/40 Kgs)	
	Punjab	Sindh
Rs 50000	146	156
Rs 60000	179	193
Rs 70000	213	230
Rs 80000	247	266

14. COMPARATIVE ECONOMICS OF SUGARCANE AND COMPETING CROPS

48. Resource allocation among the competing enterprises is primarily governed by the economic considerations reflected in their gross cost, gross income, gross margin, net income, output-input ratio, etc.

49. Sugarcane is planted in the irrigated regions of the country and being an annual crop, it competes for land, water and other farm resources with both 'kharif' and 'rabi' crops. Economics of sugarcane and competing crops/ crop combinations has been analyzed in terms of output prices (received by growers) and input prices paid by growers during the 2010-11 crop year. Detail of the analysis is presented for the Punjab and Sindh provinces in Annex-XIII. A summary of various economic indicators is provided in Table-16 and Table-17 and results of the analysis are briefly discussed in the following paragraphs.

Table - 16 Economics of Sugarcane and Competing Crops at Prices Realized by the Growers for 2010-11 crop in Punjab Province

Competing crops/ combinations	Output/input ratio	Gross revenue per		
		Rupee of purchased inputs cost	Day of crop duration	Acre inch of irrigation water used
		---------- Rupees ----------		
1. Sugarcane	1.80	5.34	236	1940
2. Cotton + wheat	1.64	4.27	214	2649
3. Cotton + sunflower	1.76	5.19	218	2080
4. Basmati + wheat	1.17	2.55	167	860
5.Basmati+ sunflower	1.27	3.06	171	771
6. IRRI + wheat	1.24	2.81	169	822
7. IRRI + sunflower	1.36	3.42	173	742

14.1 Punjab

50. The API field survey revealed that sugarcane growers on the whole received lucrative prices which were much above the indicative price. It was also endorsed by the farmer representatives and provincial authorities in the API Standing Committee Meeting on Sugarcane held in Islamabad. Resultantly, returns to overall investment in sugarcane in Punjab are higher as compared to all competing crop combinations (Table-16). Sugarcane has got an edge over all crop combinations in terms of returns to all economic criteria used in the analysis except for irrigation water where cotton + wheat and cotton + sunflower combinations have out performed sugarcane.

14.2 Sindh

51. Similarly growers in Sindh have also received remunerative prices (much higher than the indicative price) resulting in improved economic position of sugarcane. Like Punjab, sugarcane in Sindh also yields higher returns than the competing crop combinations. During 2010-11 farmers received higher returns in sugarcane farming than the competing crop in terms of all selected indicators (Table- 17). However, returns to irrigation water for cotton + wheat and cotton + sunflower combinations are found higher than sugarcane.

Table - 17 Economics of Sugarcane and Competing Crops at Prices Realized by the Growers in for 2010-11 Crop in Sindh

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	1.89	5.70	242	1663
2. Cotton + wheat	1.75	4.85	210	2934
3. Cotton + sunflower	1.88	5.13	221	2325
4. IRRI + wheat	1.34	3.43	166	877
5. IRRI + sunflower	1.47	4.27	179	828

14.3 Economics of Sugarcane: Inter Provincial Comparison

52. In view of its longer duration, sugarcane crop in the Sindh province requires more water and other inputs as compared to Punjab. Chemical fertilizers in Sindh are used on higher side by 86 per cent in nitrogenous and by 15 per cent in phosphatic ingredients. Similarly, cost of purchased inputs is also higher in Sindh by about 19 per cent (Table-18).

53. In both provinces, sugarcane surpasses other competing enterprises in all respects except gross returns to irrigation water where cotton + wheat and cotton + sunflower combinations outperform sugarcane with a significant margin.

54. The higher yield of Sindh by 20 percent over Punjab may be explained in terms of relatively greater use of inputs. Overall returns to purchased inputs and crop duration are relatively higher in Sindh. However, returns to water used for the crop in Sindh are less than Punjab. Thus it may be ascertained that water use efficiency in Sindh lags behind Punjab.

Table-18 Input Use Level and Yield of Sugarcane in Sindh Versus Punjab: 2010-11 Crop

Item	Unit	Sindh	Punjab	Difference of the Sindh province over Punjab (%)
Crop duration	Crop day	488	394	24 (+)
Irrigation water	Acre inch	71	48	48 (+)
Purchased inputs other than fertilizer	Rs./ acre	20,704	17,450	19 (+)
Fertilizer Use				
N	Nutrients kg/acre	104	56	86 (+)
P	"	39	34	15 (+)
Crop yield	40 kg/ acre	676	565	20 (+)

15. IMPACT OF INCREASE IN SUGAR PRICE ON CONSUMER PRICE INDEX (CPI)

55. Expenditure on sugar is one of the important items in average household budget. Sugar is also included in the basket of goods used in estimating the Consumer Price Index (CPI). Any change in sugar price affects the household budget and CPI as well. Details of analysis are presented in **Annex XIV,** while a summary of the results is given in Table-19.

15.1 Impact on CPI

55. The Federal Bureau of Statistics (FBS) has estimated the changes in CPI as a result of increase in sugar price over the base price of Rs 60 per kg. The impact of increase in sugar price on CPI is given in Table-19.

56. It is evident from the Table-18 that every increase of rupee 1 per kg over the base price of Rs 60 per kg is expected to raise the CPI by 0.034 per cent, other things remaining the same. Accordingly, the CPI is likely to increase by 0.168 and 0.337 per cent, if sugar price is increased by Rs 5 and Rs 10 per kgs.

Table – 19 Impact of Increase in Price of Sugar on CPI and Household Expenditure

Sugar price	Rise in CPI	Increase in annual expenses on the basis of average per capita sugar availability @ 23.42 kgs per year	
		Per head	Per household
Rs per kg		---------- Rupees ----------	
60 (Base price)	Per cent		
61	0.034	24	158
62	0.067	47	316
63	0.101	70	474
64	0.135	94	632
65	0.168	117	791
66	0.202	141	949
67	0.236	164	1107
68	0.269	188	1265
69	0.303	211	1423
70	0.337	234	1581

Note: Average size of household comprises 6.75 members.

Sources: Federal Bureau of Statistics (FBS), Karachi.

15.2 Impact on Household Expenditure

57. According to the Household Integrated Economic Survey (HIES) by the FBS, the average household in Pakistan consists of 6.75 members. The annual per capita availability of sugar based on the Balance Sheet Method has averaged at 23.42 kgs during last decade. In view of per capita sugar availability @ 23.42 kgs per annum and average household size of 6.75 members, the impact of selected increases in sugar price on the average household expenditure has been presented in Table-18. It may be seen that every increase of Re 1 in sugar price over the base level of Rs 60 per kg would raise the CPI by 0.034 per cent. In addition, the per head and average household expenditure would increase by Rs 24 and Rs 158 per annum with rise in sugar price by Rs 1 per kg, other things remaining the same. Accordingly, an increase of Rs 5 and Rs 10 over the base level would increase the per head expenditure by Rs 117 and 234 per annum and average household expenditure by Rs 791 and Rs 1581 per annum.

16. ECONOMIC EFFICIENCY IN SUGARCANE PRODUCTION

58. The economic efficiency in sugarcane production has been evaluated by estimating the most commonly used economic parameters, viz Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC) and Domestic Resource Cost Coefficient (DRC) through Policy Analysis Matrix (PAM). To ascertain the impact of overtime changes in input-output prices, the analysis has been carried out for 2007-08 through 2010-11. Matrix is given in Table 20 and Details are Annex - XVI.

16.1 Nominal Protection Coefficient (NPC)

59. The NPCs estimated under sugar importing situation for the Punjab province have been less than one during the entire period under analysis. As a rule of thumb, NPC less than one implies that growers generally receive prices less than the corresponding import parity price. Thus the estimates reveal that the cane growers of Punjab are implicitly taxed.

60. The NPCs estimated for Sindh suggest that prices of sugarcane received by growers during 2007-08 and 2008-09 remained higher than the corresponding import parity price. However, the growers realized prices lower than the corresponding import parity price in the crop year 2009-10 and 2010-11.

16.2 Effective Protection Coefficient (EPC)

61. The 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 distortions in the input markets, EPC also takes account of the impact of the policy interventions in the inputs markets. Thus, it is a more meaningful measure for analyzing the protection/ taxation for a given commodity.

62. For Sindh, the analysis of the EPC estimates under importing scenario, reveals that the EPC values have been less than one during the period under study except in 2007-08 and 2008-09. It implies that growers of Sindh were implicitly taxed through input/ output pricing policies.

Table-20: Economic Efficiency Coefficients for Sugarcane in Pakistan POLICY ANALYSIS MATRIX (PAM)

Province/Year	Based on Import Parity Prices		
	NPCs	EPCs	DRCs
Punjab			
2007-08	0.93	0.87	0.62
2008-09	0.72	0.66	0.27
2009-10	0.80	0.76	0.25
2010-11	0.69	0.68	0.28
Sindh			
2007-08	1.11	1.11	0.73
2008-09	1.07	1.05	0.48
2009-10	0.79	0.76	0.24
2010-11	0.69	0.67	0.28

16.3 Domestic Resource Cost (DRC) Coefficient

63. 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 "comparative disadvantage" in domestic production as cost associated with its domestic production is greater than the economic cost of corresponding imports. A situation of DRC less than one implies "comparative advantage" in domestic production as it can save/generate foreign exchange at cost less than the corresponding cost of imports.

64. The DRCs for sugarcane crop estimated at import parity prices are less than one, both in the Punjab and Sindh. It indicates that cane production in both the provinces is efficient in terms of its domestic resource cost.

17. MARKETING OF SUGARCANE

65. Sugarcane is one of the major cash crops of Pakistan. Due to perishable nature of the produce, it cannot be stored after its harvesting and has to be processed either into gur/ khandsari at the farm level or into sugar by the sugarmills. Thus, its marketing plays a pivotal role in this regard. For ascertaining the situation regarding marketing of sugarcane, API conducted a field survey in the main sugarcane growing areas during the month of January 2011. The survey teams interviewed cane growers, sugar mills' management and crop experts. The meeting of the API Standing Committee on Sugarcane, held on February 12, 2011 also discussed matters relating to cane marketing. The problems faced by the growers in marketing of sugarcane are discussed in the following paragraphs.

Supply of Sugarcane

66. There was comfortable supply of sugarcane to the sugar mills in the Punjab and Sindh during January 2011. However, the sugar mills in the KPK as in the past are not getting adequate supplies. The sugar mills in this province are facing the problem of short supplies since many years.

Sugarcane Prices

67. Sugar mills in Punjab, by and large, were paying Rs 250 per 40 kgs at the mill gate in December 2010 which decreased to Rs 170 in the last week of January, 2011. Price of cane paid by the mills in Sindh are reported Rs 185 per 40 kgs including quality premium and transport subsidy. In KPK sugarcane price paid to growers ranged between Rs 200 to 270 per 40 kgs at the mill-gate.

Under weighing

68. The under weighing of cane at purchase centres and the mills premises is a common phenomenon on the part of mills and their agents and the private purchase centres. The scales and weighbridges installed at the procurement centers do not record the correct weight. The extent of under weighing varies from place to place for each mill. The growers have alleged that under weighing was up to the extent of 10-20 per cent of weight. The district governments may install their own weighbridges to solve this problem and ban the use of temporary weighbridges at purchase centres.

Undue Deductions

69. It has been noticed that mills are making deductions on the plea that poor quality cane with high trash content is brought by the farmers. In some places these deductions go upto 10 per cent. To overcome the situation, the growers may be educated to properly clean the trash before bringing cane to the mills and the Cane Commissioners may have strict check for undue deductions.

Delayed Payments

70. In the beginning of the season, the payments are generally made within two weeks but as the season progresses, 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.

Presence of Middlemen

71. The presence of middlemen is considered necessary in marketing the agricultural produce. But since manufacturing of sugar is a chemical process, the presence of middlemen in sugarcane supply to the mills cause delay and hence reduction in sugar recovery. The middlemen therefore, in sugarcane marketing do harm to the mills and growers. Thus, the involvement of middlemen in sugarcane supply needs to be banned through administrative measures.

Purchase of CPRs

72. Since some of the mills delay the payments, the growers are compelled to sell the CPRs at less price. This practice causes huge losses to the growers. Therefore, it needs to be stopped altogether. Moreover, the mills should also be obligated to make payments within two weeks after supply to the mills as laid down in the Sugar Factories Control Act so that pressure for selling the CPRs is subsided.

Use of Sugarcane Cess Fund

73. The provincial governments collect and maintain the accounts of sugarcane cess fund. The cess fund is to be utilized for the construction of new roads and improvement of the existing roads including other infrastructure in the mill premises. The fund can also be utilized for research and development of sugarcane crop. The provincial governments are known to have accumulated huge amounts of cess funds which needs to be properly used on construction of infrastructure and evolvement of new varieties of sugarcane.

Amendments in Sugar Factories Control Act

74. The sugar mills function under the provisions of the Sugar Factories Control Act, 1950. Many changes have occurred in cane marketing after de-zoning and the functioning of the Act has become less effective. So there is a need that the Act may be amended in accordance with the current needs, especially the promotion of the provisions of the contract system between growers and the sugar mills and removal of provisions regarding prohibition of gur making and zoning, etc.

18. IMPROVING PRODUCTIVITY

75. Sugarcane is one of the important crops in our agriculture. However, in the country, till to day no desirable research has been carried out for increasing productivity of the crop. As a result, sugar recovery is hardly 8-9 per cent against 12-14 percent in other sugar producing countries.

76. Available statistics indicate that vast scope exists for yield improvement in sugarcane and its sucrose content. Currently both yield per acre of cane and recovery percentage lie much below in comparison with other sugar producing countries. Average type of sugarcane grower in Pakistan obtains 16-20 tonnes sugarcane per acre

77. Likewise, sugar recovery is also low. For example, Australian sugar recovery percentage is five times more than Pakistan. Agriculture Policy Institute (API) has been suggesting various measures in its Sugarcane Price Policy Reports for increasing yields of sugarcane. These have been reviewed and discussed below in the light of latest situation to facilitate decision making and follow up action by the concerned agencies:

Varietals Development

78. One of the major sugarcane yield hindering factors in Pakistan's climatic conditions is limited variety base. As research institutions mandated for the development of new varieties of sugarcane do not have sufficient funds due to which any significant breakthrough could not be made in this area. Considering financial limitations of the sugarcane research institutes, provincial governments should earmark a sizable percentage of the Sugar Cess Fund for research and development of sugarcane. But despite repeated requests of different stake-holders and directives of the ECC of the Cabinet, except release of a few lac rupees by the government of NWFP, funds have not been provided by the provincial governments for varietal development work. Thus, API emphasizes allocation of additional funds and introduce of a mechanism for periodic review of the research work at sugarcane research stations.

Land Preparation

79. Generally sugarcane cultivation is followed by cotton and rice. As sugarcane is deep rooted rotted crop, use of deep ploughing is necessary to provided better conditions beneath the surface layer of the soil for better development of the root system. The evidence from the field reveals that only 30-40 percent of the sugarcane growers use deep tillage implements. Majority of the farmers are not aware of usefulness of the deep tillage. Sugarcane crop experts give much importance to sowing methods to increase per acre yield of the crop and urge to increase row to row distance in sowing of sugarcane as it helps increase yield of the crop. However, cost of machinery used in sugarcane cultivation has exorbitantly increased which discourages use of machinery. Keeping in view this state of affairs, Department of Agriculture, (Extension) needs to launch educational campaigns to apprise the farmers about proper methods of land preparation for sugarcane cultivation.

Provision of Approved Varieties' Seed

80. A number of high yielding varieties for early, mid and late sowing are available but their adoption among the sugarcane growers largely depends on availability of disease free seed of these varieties. Yield of these varieties obtained at the research stations ranges between 80-100 tonnes per hectare. These varieties include SPE-213, SPF-234, COJ-84, BF-162, CP-33/43, CP-77/400, Cp-72/2086, CPF-237 and HSF-240. Sugar recovery from these varieties ranges between 10-12.5 per cent. For Sindh, BL-4, PR-1000 and BF-129 are the recommended varieties. Recommended varieties for NWFP are CP-72/2086, CP-77/400, Mardan-92 and MR-93. All of these varieties if cultivated in accordance with the export recommendations (suggested sowing time particularly) can yield up to 1000 maunds per acre and sucrose recovery more than 10 per cent.

81. In general farmers get next crop seed from their commercial crop without treating it for fungal diseases because no institutional arrangements are available for production, multiplication and distribution of quality seed of potential varieties. Sugar mills' initiative

for cane development activities also lacks. Thus API reiterate its' recommendation on the subject as below:

82. Provincial Agriculture Departments should launch an aggressive campaign for educating sugarcane growers regarding sowing of approved varieties and discouraging the cultivation of un-approved varieties.

83. The sugar industry must offer price incentive to farmers on the basis of sucrose content.

84. Sugar industry, the main beneficiary of increased production of sugarcane, be obligated for thorough role in the production, multiplication and distribution of certified seed of sugarcane. For this purpose sugar mills should establish their cane development centres either individually or collectively. These centres may coordinate efforts of the progressive growers, crop researchers and sugar mills.

85. The sugar mills should provide the facilities of Hot Water Treatment of cane sets to the growers and technical guidance for using the technique.

Low Plant Population

86. One of the important productivity hindering factor in sugarcane is less number of plants per acre. This is general observation that even good quality seed do not yield more than 60 per cent germination in case of sugarcane. So it is necessary to adjust the seed appropriately to get optimum crop stand and ultimately optimum crop yield. Generally 80-100 maunds seed of thin and 100-120 maunds seed of thick varieties of cane is recommended for cultivation of one acre. However, for getting 100 percent germination this quantity must be increased by adopting double set sowing method as advised by the experts. Each seed set must have two buds and should be placed in furrows by joining their ends and be covered with 2-3 inches thick layer of soil. Gaps must be filled. Provincial Agriculture (Extension), Departments need to extend necessary advice and guidance to the farmers on sowing techniques of sugarcane.

PART TWO

SUMMARY
OF
FINDINGS AND RECOMMENDATIONS
FOR
SUGARCANE PRICE POLICY OPTIONS:
2011-12 CROP

SUMMARY OF FINDINGS AND RECOMMENDATIONS FOR SUGARCANE PRICE POLICY: 2011-12 CROP

1. Sugarcane is the second largest non-food crop after cotton in Pakistan. Among top ten cane producing countries, Pakistan ranks fourth in respect of acreage, fifth in terms of production and tenth in terms of yield. In spite of water shortage and persistent rise in input prices, production increased by 8.8%, area by 5.8% and yield by 2.8% in 2010-11 over 2009-10. However, achievements were less than the targets for the referred year. Negative growth is registered in the area and production of sugarcane in Sind, KPK and Baluchistan. The area and production targets could not be achieved as the growers opted for other cash crops like cotton, maize, onions, vegetables and fruits in place of sugarcane.

2. The sugar production from 2010-11 crop has been estimated at 3.4 million tones. Adding 334 thousand tones of leftover stocks from 2009-10, the total sugar supply for 2010-11 consumption year is estimated to 3.73 million tons. Based on average per capita availability of sugar estimated at 23.42 kgs during 2007-10, total domestic requirement for a population of 180.21 million has been estimated at 4.22 million tones for 2010-11 consumption year. Normally sugar stock ends on September 30 each year. It is expected that during the current year industry could not fulfill local demand. There are many factors behind this demand supply gap situation. Hence there is an estimated shortfall in supply to the tune of 0.49 million tones (Annex I).

3. The issues relating to low cane productivity were discussed in detail in the API's Standing Committee Meeting on Sugarcane held on 12 February 2011 with the conclusions that:

- Cost of production of sugarcane should be reduced by cultivating high yielding varieties of the cane;
- Industry should reduce cost of production of sugar by converting by products into value added products (ethanol etc);
- Government should maintain subsidy on the inputs.
- Indicative Price of sugarcane for the next crop may be increased to enable farmers to cover exorbitantly rising costs of diesel, fertilizer and labor wages.
- Small farmers have limited access to seed of new high yielding varieties of sugarcane which is undermining yield of the crop.
- WAPDA s restriction on operating single phase electricity motors for tube well irrigation
- Delayed cane payments from the sugar mills.

- Per unit cost of sugar manufacturing may be reduced by promoting beet sugar as it does not need fuel energy for sugar manufacturing.

- Sugar deficit may be reduced by crushing more sugar beet

LIKELY PRICE POLICY OPTIONS

A) Based on Cost of production (COP)

4 The COP of sugarcane for Punjab, KPK, and Sindh has been estimated at Rs.115.78, 103.27 and 120.13 per 40 Kgs respectively.

5. The prices received by the cane growers for their 2010-11 crop has an average of Rs 175 per 40 Kgs in Punjab and went as high as Rs 185 per 40 Kgs in Sindh.

6. Important determinants are summarized below.

7. Cost of sugarcane production is an important determinant to suggest Indicative Price of Sugarcane. Primary data for its calculation has been collected directly through field surveys conducted by the Agriculture Policy Institute in provinces of Punjab, Sindh and KPK. It has been further discussed with stakeholders in the APIs Standing Committee Meeting. Inputs prices have been obtained from concerned institutions and reconfirmed from market sources. Tariff rates have also been collected from relevant institutions. The cost of production calculated for Punjab, Sindh and KPK are Rs. 127.80, 127.40 and 124.40 respectively. (VI to VIII)

8. The prices once announced after due consideration of relevant factors must be ensured to the growers.

B) Mill-gate Prices of Sugarcane based on Domestic Wholesale Price of Sugar for 2010-11 consumption year.

9. Sugarcane prices have also been estimated from the wholesale prices of sugar during the 2010-11. This analysis is based on actual sucrose recovery as reported by the PSMA; processing cost of sugar discussed in detail in various meetings of the PSMA and MINFA; export prices of molasses as reported by FBS; and General Sales

Tax of Rs 2.31 per Kg of sugar. A summary of sugarcane prices estimated under this scenario from various wholesale prices of sugar is presented in table given below and (Annex II and III)).

Sugarcane Prices Estimated from Wholesale Prices of Sugar during 2010-11

Wholesale prices of sugar (Rs /Tons)	Sugarcane prices (Rs/40 Kgs)	
	Punjab	Sindh
Rs 50000	146	155
Rs 60000	180	191
Rs 70000	214	288
Rs 80000	248	264

C) Import and Export Parity Prices of Sugarcane

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

11. Both the import and export parity prices have been calculated on the basis of white sugar price (fob London). Results are summarized in the table given below and Annex (IV and V).

Import/Export Parity Prices of Sugarcane as Worked Back from Average fob (London) Prices of Sugar

Average fob London prices of white sugar per tone	Sugarcane prices (Rs/40 kgs)	
	Punjab	Sindh
Import parity		
US $ 755.95 (February, 2011)	236.96	255.30
US $ 735.23 (Oct 2010 to Feb 2011)	230.24	248.32
US $ 445.56 (2007-08 to 2009-10)	140.22	150.69
Export parity		
US $ 755.95 (February, 2011)	197.97	213.32
US $ 735.23 (Oct 2010 to Feb 2011)	191.78	206.61
US $ 445.56 (2007-08 to 2009-10)	105.30	112.83

D) Indicative Price of Sugarcane

12. The provincial governments may adopt any of the following price options based on comprehensive analysis of various determinants briefly discussed in the summary.

Based on	Sugarcane price at mill gate (Rs. per 40 Kgs)		
	Punjab	KPK	Sindh
1. **Cost of production of sugarcane**	127.80	127.40	124.40
2. **Average wholesale prices of sugar prevailed at**	**197**		**224.5**
a) Rs 50,000 per ton	146	-	155
b) Rs 60,000 per ton	180	-	191
c) Rs 70,000 per ton	214	-	288
d) Rs 80,000 per ton	248	-	264
3. **Prices received by cane growers**	175	-	185
4. **Import Parity based on** average fob London price of white sugar at US $ 755.957 ton (February 2011)	240	-	255
5. **Export Parity based on: average** fob London price of white sugar at US $ 755.95 ton (February 2011)	201	-	214
Average	188	-	200

E) POLICY RECOMMENDATIONS

13 Under the rising trend in sugar prices both in global as well as in domestic markets and expected less domestic production from 2010-11 crop ***it would be advisable for the government to maintain sufficient stock of sugar through imports. However, imports should not exceed 0.49 million tons.***

14. To avoid uneconomic expansion in sugarcane acreage and in turn sugar mills, sugarcane production should be confined to meet only domestic requirement. To improve the economics of sugar and sugarcane production, cultivation of high sucrose cane varieties by the growers and conversion of molasses into value-added by-products like ethanol should be persuaded by the provincial governments

15. Based on the factors analyzed above and keeping in view indicative price of last year, indicative price of sugarcane for 2011-12 crop at mill gate is recommended at Rs 150 per 40 Kgs for Punjab and NWFP and Rs 155 for Sindh.

19. ACKNOWLEDGEMENT

Work of the staff engaged in completion of the report is acknowledged.

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DISTRICT- WISE AREA, YIELD AND PRODUCTION OF SUGARCANE
AVERAGE OF 2007-08 TO 2009-10

ANNEX-I

Area: 000 ha
Production: 000 tonnes
Yield: Tonnes/hectare

S.No	Province/ District/ Agency	Area	Production	Share in total production	Yield	S.No	Province/ District/ Agency	Area	Production	Share in total production	Yield
	PUNJAB						**KHYBER PUKHTOONKHOWA**				
1	Attock	0.20	7.70	0.01	38.50	1	Peshawar	11.61	599.33	1.10	51.60
2	Rawalpindi	0.00	0.00	0.00	0.00	2	Charsadda	31.49	1418.48	2.61	45.05
3	Islamabad	0.00	0.00	0.00	0.00	3	Nowshera	5.15	258.79	0.48	50.29
4	Jhelum	0.20	8.18	0.02	40.90	4	Mardan	29.23	1357.72	2.49	46.46
5	Chakwal	0.00	0.00	0.00	0.00	5	Swabi	4.28	160.78	0.30	37.52
6	Sargodha	62.59	2888.70	5.31	46.15	6	Kohat	0.16	5.74	0.01	34.79
7	Khushab	6.75	293.96	0.54	43.57	7	Hangu	0.02	0.53	0.00	34.89
8	Mianwali	3.24	142.38	0.26	43.99	8	Karak	0.00	0.00	0.00	0.00
9	Bhakkar	15.38	623.35	1.14	40.53	9	Mansehra	0.01	0.14	0.00	24.40
10	Faisalabad	108.72	5270.40	9.68	48.48	10	Battagram	0.00	0.00	0.00	0.00
11	T.T.Singh	39.93	1999.90	3.67	50.09	11	Abbottabad	0.00	0.00	0.00	0.00
12	Jhang	93.75	4402.24	8.09	46.96	12	Haripur	0.10	3.26	0.01	31.49
13	Gujrat	2.56	104.07	0.19	40.60	13	Kohistan	0.00	0.00	0.00	0.00
14	M.B.Din	32.37	1348.86	2.48	41.67	14	Malakand	4.83	187.51	0.34	38.84
15	Sialkot	1.62	48.41	0.09	29.94	15	Swat	0.00	0.00	0.00	0.00
16	Narowal	2.02	62.46	0.11	30.87	16	Bunir	0.31	8.93	0.02	28.90
17	Gujranwala	2.43	91.88	0.17	37.86	17	Shanlapar	0.00	0.00	0.00	0.00
18	Hafizabad	6.34	242.36	0.45	38.21	18	Dir Lower	0.21	6.44	0.01	30.72
19	Sheikhupura	2.29	102.35	0.19	44.63	19	Dir Uper	0.00	0.00	0.00	0.00
20	Nankana Sahib	18.88	855.50	1.57	45.30	20	Chitral	0.00	0.00	0.00	0.00
21	Lahore	0.40	17.52	0.03	43.79	21	D.I.Khan	11.42	489.52	0.90	42.86
22	Kasur	42.36	1966.53	3.61	46.43	22	Tank	0.32	7.61	0.01	23.82
23	Okara	20.10	885.82	1.63	44.07	23	Bannu	0.61	24.55	0.05	40.08
24	Sahiwal	10.12	413.63	0.76	40.89	24	Lakki Marwat	0.04	1.58	0.00	37.41
25	Pakpattan	6.88	343.03	0.63	49.83	25	Mohmand AG.	0.52	14.20	0.03	27.30
26	Multan	2.70	113.48	0.21	42.08	26	Khyber AG.	0.68	15.03	0.03	22.00
27	Lodhran	1.89	92.00	0.17	48.77	27	Kurram AG.	0.00	0.00	0.00	0.00
28	Khanewal	11.74	584.63	1.07	49.83	28	Orakzai AG	0.00	0.00	0.00	0.00
29	Vehari	18.34	1033.22	1.90	56.33	29	Bajour AG.	0.03	0.93	0.00	27.95
30	Muzaffargarh	37.36	1938.91	3.56	51.89	30	N.Waziristan	0.05	1.93	0.00	40.03
31	Layyah	13.90	699.91	1.29	50.37	31	S.Waziristan	0.00	0.00	0.00	0.00
32	D.G.Khan	4.18	213.71	0.39	51.09	32	F.R.Peshawar	0.01	0.55	0.00	59.46
33	Rajanpur	13.49	810.35	1.49	60.09	33	F.R.Kohat	0.00	0.00	0.00	0.00
34	Bahawalpur	11.74	610.48	1.12	52.01	34	F.R.Bannu	0.08	3.36	0.01	40.55
35	R.Y.Khan	88.63	5611.70	10.31	63.32	35	F.R.D.I.Khan	0.11	2.57	0.00	23.09
36	Bahawalnagar	17.26	813.76	1.49	47.14						
	Sub Total	**700.36**	**34641.59**	**63.63**	**49.46**		**Sub Total**	**101.28**	**4569.48**	**8.39**	**45.12**
	SINDH						**BOLUCHISTAN**				
1	Khairpur	21.14	1271.69	2.34	60.16	1	Quetta	0.00	0.00	0.00	0.00
2	Ghotki	6.35	379.17	0.70	59.76	2	Pishin	0.00	0.00	0.00	0.00
3	Sukkur	2.38	137.68	0.25	57.75	3	K.Abdullah	0.00	0.00	0.00	0.00
4	N.Feroze	20.84	1214.20	2.23	58.27	4	Chaghi	0.00	0.00	0.00	0.00
5	Nawabshah	24.47	1239.72	2.28	50.66	5	Loralai	0.00	0.00	0.00	0.00
6	Jacobabad	0.17	7.73	0.01	46.67	6	Musa Khel	0.00	0.00	0.00	0.00
7	Shikarpur	0.05	2.48	0.00	49.56	7	Barkhan	0.00	0.00	0.00	0.00
8	Larkana	0.61	30.04	0.06	48.92	8	Zhob	0.00	0.00	0.00	0.00
9	Sanghar	12.38	660.49	1.21	53.33	9	Killa Saifullah	0.00	0.00	0.00	0.00
10	Tharparkar	1.36	64.13	0.12	47.19	10	Sibi	0.50	24.08	0.04	48.07
11	Mirpurkhas	18.54	1013.56	1.86	54.66	11	Ziarat	0.00	0.00	0.00	0.00
12	Dadu	2.74	131.47	0.24	47.96	12	Kohlu	0.00	0.00	0.00	0.00
13	Hyderabad	69.52	4112.34	7.55	59.15	13	Dera Bughti	0.00	0.00	0.00	0.00
14	Badin	53.20	3020.21	5.55	56.77	14	Nasirabad	0.07	3.98	0.01	57.73
15	Thatta	35.13	1916.30	3.52	54.56	15	Jaffarabad	0.02	1.05	0.00	57.00
16	Karachi	0.00	0.00	0.00	0.00	16	Bolan	0.00	0.00	0.00	0.00
						17	Jhal Magsi	0.00	0.00	0.00	0.00
						18	Kalat	0.00	0.00	0.00	0.00
						19	Khuzdar	0.00	0.00	0.00	0.00
						20	Awaran	0.00	0.00	0.00	0.00
						21	Kharan	0.00	0.00	0.00	0.00
						22	Lasbela	0.09	4.75	0.01	51.23
						23	Turbat	0.00	0.00	0.00	0.00
						24	Panjgoor	0.00	0.00	0.00	0.00
	Sub Total	**268.88**	**15201.21**	**27.92**	**56.54**		**Sub Total**	**0.68**	**33.86**	**0.06**	**49.72**
							Pak Total	**1071.20**	**54446.14**	**100.00**	**50.83**

Notes:
1. Data have been arranged in decending order of production.
2. Percentage shares are calculated on the basis of country total.

Sources:
1- MINFAL, Islamabad
2- Respected Agriculture Provincial Departments

ANNEX-II

PROVINCE-WISE AREA ,PRODUCTION AND YIELD OF SUGARCANE
IN PAKISTAN : 2000-01 TO 2010-11

YEAR	PUNJAB	SINDH	KPK	BALOCHISTAN	PAKISTAN
AREA	------------------------- 000 hectares -------------------------				
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	644.7	214.9	106.4	0.4	966.4
2005-06	625.2	183.2	98.6	0.5	907.5
2006-07	711.8	214.7	101.8	0.5	1028.8
2007-08	827.2	308.8	104.8	0.5	1241.3
2008-09	666.5	263.9	98.2	0.8	1029.4
2009-10	607.4	233.9	100.8	0.7	942.8
2010-11	675.0	226.5	93.6	0.6	995.7
YIELD	------------------------- Tonnes per hectare -------------------------				
2000-01	43.44	50.46	45.18	53.67	45.39
2001-02	48.42	47.43	47.16	50.00	48.06
2002-03	45.11	53.35	48.13	50.75	47.34
2003-04	47.99	56.22	45.28	48.25	49.72
2004-05	51.26	43.54	45.27	51.20	48.88
2005-06	46.33	61.38	45.02	32.22	49.22
2006-07	52.74	58.36	45.63	50.60	53.21
2007-08	48.73	60.86	45.73	56.20	51.49
2008-09	48.45	50.41	44.89	49.22	48.62
2009-10	51.57	57.74	44.72	50.86	52.37
2010-11	53.39	59.41	44.72	51.33	53.94
PRODUCTION	------------------------- 000 Tonnes -------------------------				
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	33048.0	9357.4	4816.2	22.5	47244.1
2005-06	28968.6	11243.4	4439.0	14.5	44665.5
2006-07	37541.9	12529.2	4645.0	25.3	54741.4
2007-08	40306.0	18793.9	4792.0	28.1	63920.0
2008-09	32294.7	13304.3	4408.5	37.9	50045.4
2009-10	31324.0	13505.4	4507.9	35.6	49372.9
2010-11	36038.9	13456.0	4185.9	30.8	53711.6

Sources: 1- For 2000-01 to 2009-10 : Agricultural Statistics of Pakistan 2008-09,MINFA, Islamabad.
2- For 2010-11: Second estimates provided by concerned Provincial Agriculture Departments

PART THREE

ANNEXES

ANNEX-III

AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN THE PUNJAB:
2010-11 AND 2011-12 CROPS

Sr. No.	Operations / inputs	Avg No. of oprs/units/ acre	2010 -11 Crop		2011 - 12 Crop		Change in 2011-12 over 2010-11
			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	1000.00	476.00	1200.00	571.20	95.20
	1.2 Rotavator	0.152	1200.00	182.40	1300.00	197.60	15.20
	1.3 Ploughing	7.847	400.00	3138.80	500.00	3923.50	784.70
	1.4 Planking	3.309	200.00	661.80	250.00	827.25	165.45
	1.5 Levelling	0.561	525.00	294.53	600.00	336.60	42.08
2	Seed bed preparation:						
	2.1 Ploughing/Furrow making	0.467	400.00	93.40	500.00	116.75	23.35
	2.2 Planking	0.193	200.00	19.30	250.00	24.13	4.83
	2.3 Trench/Ridge making						
	2.3.1 Manual (m.days)	0.106	250.00	13.25	300.00	15.90	2.65
	2.3.2 Tractor	0.7	400.00	140.00	500.00	175.00	35.00
	2.4 Bund making						
	2.4.1 Manual (m.days)	1.655	250.00	206.88	300.00	248.25	41.38
	2.4.2 Tractor	0.158	400.00	31.60	500.00	39.50	7.90
3	Seed and Sowing operations:						
	3.1 40 kg units	6.578	170.00	559.13	190.00	624.91	65.78
	3.2 Marlas	10.64	850.00	4522.00	950.00	5054.00	532.00
	3.3 Harvesting, stripping and making of set (m.days)	4.796	250.00	599.50	300.00	719.40	119.90
	3.4 Transport	-	-	250.00	-	280.00	30.00
	3.5 Sowing of sets (m.days)	0.781	250.00	97.63	300.00	117.15	19.53
	3.6 Contract sowing	-	-	300.00	-	350.00	50.00
4	Interculture and Earthing up:						
	4.1 Manual/binding of plants	0.609	975.00	593.78	1150.00	700.35	106.58
	4.2 Bullock/tractor	2.008	425.00	853.40	500.00	1004.00	150.60
5	Plant Protection:						
	5.1 Weedicides	0.124	375.00	53.94	450.00	55.80	1.86
	5.2 Granules	0.120	410.00	49.20	425.00	51.00	1.80
	5.3 Sparys	0.305	460.00	140.30	500.00	152.50	12.20
6	Irrigation:						
	6.1 Canal	8.9	-	250.00	-	250.00	0.00
	6.2 Private tubewell	4.44	1000.00	4440.00	1120.00	4972.80	532.80
	6.3 Mixed	2.16	205.00	442.80	230.00	496.80	54.00
	6.4 Labour for irrigation and water course cleaning (m.days)	4.86	250.00	1215.00	300.00	1458.00	243.00
7	Farm Yard Manure:						
	7.1 Material	-	-	825.00	-	1000.00	175.00
	7.2 Transport & application	-	-	825.00	-	975.00	150.00
8	Fertilizers: (bags)						
	8.1 DAP	1.28	2663.00	3408.64	4067.00	5205.76	1797.12
	8.2 Urea	1.73	793.00	1371.89	1179.00	2039.67	667.78
	8.3 Nitrophos	0.35	1733.00	606.55	2628.00	919.80	313.25
	8.4 SSP	0.01	733.00	7.33	1120.00	11.20	3.87
	8.5 CAN	0.01	681.00	6.81	1003.00	10.03	3.22
	8.6 SOP	0.07	2502.00	175.14	3702.00	259.14	84.00
	8.7 Gypsum	0.44	60.00	26.40	100.00	44.00	17.60
	8.8 Fert. transport and application	3.89	45.00	175.05	60.00	233.40	58.35
9	Mark up @ 12.0 % per annum for 13 months on items 1 to 8 minus item 6.1	-	-	3484.32	-	4317.35	833.03
10	Land rent for 13 months	-	12000	13000.00	20000.00	21666.67	8666.67
11	Average weighted land tax @ Rs 132/acre/ annum for 13 months	-	-	143.00	-	143.00	0.00
12	Management charges for 13 months	-	-	1055.00	-	1620.00	565.00
13	Harvesting & stripping (40 kg units)	565.15	12.50	6993.73	12.50	6993.73	0.00
14	Expected escalation in cost of selected items	-	-	2395.00	-	4026.00	1631.00
15	Total cost (items 1 to 14)	-	-	54123.48	-	72227.13	18103.66
16	Yield (40 kg units)	-	-	565.15	-	565.15	0.00
17	Cost of production at farm level: (Rs/40 kgs)						
	17.1 including land rent	-	-	95.77	-	127.80	32.03
	17.2 excluding land rent	-	-	72.77	-	89.46	16.70
18	Marketing expenses: (Rs/40 kgs)						
	18.1 Transport, etc.	-	-	10.00	-	12.00	2.00
	18.2 Development cess	-	-	0.25	-	0.25	0.00
19	Cost of production at mill-gate: (Rs/40 kgs)						
	19.1 including land rent	-	-	106.02	-	140.05	34.03
	19.2 excluding land rent	-	-	83.02	-	101.71	18.70

ANNEX-IV

AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN SINDH: 2010-11 AND 2011-12 CROPS

Sr. No.	Operations / inputs	Avg No. of oprs/units/ acre	2010 -11 Crop Cost per unit	2010 -11 Crop Cost per acre	2011 - 12 Crop Cost per unit	2011 - 12 Crop Cost per acre	Change in 2011-12 over 2010-11
1	2	3	4	5=3*4	6	7=3*6	8=7-5
				---------Rupees----------			
1	Land preparation :						
	1.1 Deep ploughing	0.523	1200.00	627.60	1300.00	679.90	52.30
	1.2 Ploughing	5.606	600.00	3363.60	750.00	4204.50	840.90
	1.3 Planking	1.577	300.00	473.10	375.00	591.38	118.28
	1.4 Levelling	0.972	600.00	583.20	750.00	729.00	145.80
2	Seed bed preparation:						
	2.1 Ploughing/Furrow making	1.136	600.00	470.30	750.00	587.88	117.58
	2.2 Planking	1.34	300.00	277.38	375.00	346.73	69.35
	2.3 Trench/ridge making						
	2.3.1 manual (m.days)	0.074	250.00	12.77	300.00	15.32	2.55
	2.3.2 tractor (hrs)	0.174	600.00	72.04	750.00	90.05	18.01
	2.4 Bund making (m.days)						
	2.4.1 manual (m.days)	0.403	250.00	69.52	300.00	83.42	13.90
	2.4.2 tractor (hrs)	0.812	600.00	336.17	750.00	420.21	84.04
3	Seed and Sowing operations:						
	3.1 40 kg units	64.118	170.00	7521.04	190.00	8405.87	884.83
	3.2 Ghuntas	0.685	4115.00	1944.95	5000.00	2363.25	418.30
	3.3 Harvesting, stripping and making of set (m.days)	4.42	250.00	762.45	300.00	914.94	152.49
	3.4 Transportation	-	-	450.00	-	500.00	50.00
	3.5 Sowing of sets (m.days)	0.588	250.00	101.43	300.00	121.72	20.29
	3.6 Contract sowing	-	-	500.00	-	600.00	100.00
4	Interculture and Earthing up:						
	4.1 Manual	1.762	950.00	1673.90	750.00	2026.30	352.40
	4.2 Bullock/tractor	1.725	600.00	1035.00	450.00	1293.75	258.75
5	Plant Protection :						
	5.1 Weedicides	0.300	410.00	123.00	400.00	127.50	4.50
	5.2 Granules	0.245	385.00	94.33	375.00	98.00	3.68
	5.3 Sprays	0.265	410.00	108.65	400.00	112.63	3.98
6	Irrigation						
	6.1 Canal	20.88	-	181.87	-	181.87	0.00
	6.2 Private tubewell	2.45	480.00	1176.00	537.00	1315.65	139.65
	6.3 Labour for irrigation and water course cleaning (m.days)	5.859	250.00	1464.75	300.00	1757.70	292.95
7	Farm Yard Manure:						
	7.1 Material	-	-	1335.00	-	1625.00	290.00
	7.2 Transport & application	-	-	760.00	-	895.00	135.00
8	Fertilizers: (bags)						
	8.1 DAP	1.512	2610.00	3946.32	4042.00	6111.50	2165.18
	8.2 Urea	3.625	795.00	2881.88	1189.00	4310.13	1428.25
	8.3 Nitrophos	0.376	1620.00	609.12	2600.00	977.60	368.48
	8.4 CAN	0.185	670.00	123.95	925.00	171.13	47.18
	8.5 AS	0.046	1150.00	52.90	1200.00	55.20	2.30
	8.6 SOP	0.085	2502.00	212.67	3700.00	314.50	101.83
	8.7 Fert. transport and application	5.829	45.00	262.31	60.00	349.74	87.44
9	Mark up @ 12.0 % per annum for 16 months on item 1 to 8 minus item 6.1	-	-	5348.05	-	6751.28	1403.23
10	Land rent for 16 months	-	10000	13333.33	15000	20000.00	6666.67
11	Land tax @ Rs 200/acre/annum for 16 months	-	-	266.67	-	266.67	0.00
12	Drainage cess	-	-	24.00	-	24.00	0.00
13	Management charges for 16 months	-	-	1298.00	-	1990.00	692.00
14	Harvesting & stripping (40 kg units)	676.02	12.50	8450.25	12.50	8450.25	0.00
15	Expected escalation in the cost of selected items	-	-	2660.00	-	4234.00	1574.00
16	Total cost (items 1 to 15)	-	-	64987.48	-	84093.54	19106.05
17	Yield (40 kg units)	-	-	676.02	-	676.02	0.00
18	Cost of production at farm level: (Rs/40 kgs)						
	18.1 including land rent	-	-	96.13	-	124.40	28.26
	18.2 excluding land rent	-	-	76.41	-	94.81	18.40
19	Marketing expenses: (Rs/40 kgs)						
	19.1 Transport, etc.	-	-	10.00	-	12.00	2.00
	19.2 Development cess	-	-	0.32	-	0.32	0.00
20	Cost of production at mill-gate: (Rs/40 kgs)						
	20.1 including land rent	-	-	106.45	-	136.72	30.26
	20.2 excluding land rent	-	-	86.73	-	107.13	20.40

ANNEX-V

AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN KPK: 2010-11 AND 2011-12 CROPS

Sr. No.	Operations / inputs	Avg No. of oprs/units/ acre	2010 -11 Crop Cost per unit	2010 -11 Crop Cost per acre	2011 - 12 Crop Cost per unit	2011 - 12 Crop Cost per acre	Change in 2011-12 over 2010-11
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	1200.00	798.00	1400.00	931.00	133.00
	1.2 Ploughing	2.776	500.00	1388.00	650.00	1804.40	416.40
	1.3 Planking	0.435	250.00	108.75	325.00	141.38	32.63
	1.4 Levelling	0.344	500.00	172.00	650.00	223.60	51.60
2	Seed bed preparation:						
	2.1 Ploughing/Furrow making	0.982	500.00	255.32	650.00	331.92	76.60
	2.2 Planking	0.027	250.00	3.51	650.00	9.13	5.62
	2.3 Trech/Ridge making (tractor hrs)	0.039	500.00	10.14	325.00	6.59	-3.55
	2.4 Bund making (m.days)	1.274	250.00	165.62	300.00	198.74	33.12
3	Seed and Sowing operations:						
	3.1 40 kg units	76.337	190.00	7542.10	250.00	9923.81	2381.71
	3.2 Harvesting, stripping and making of set (m.days)	3.671	250.00	477.23	300.00	572.68	95.45
	3.3 Transport	-	-	450.00	-	500.00	50.00
	3.4 Sowing of sets (m.days)	4.097	250.00	532.61	300.00	639.13	106.52
4	Interculture and Earthing up :						
	4.1 Manual/binding of plants	1.642	1155.00	1896.51	1385.00	2274.17	377.66
	4.2 Bullock/tractor	1.859	500.00	929.50	650.00	1208.35	278.85
5	Plant Protection:						
	5.1 Weedicides	0.360	460.00	165.60	500.00	180.00	14.40
	5.2 Granules	0.240	360.00	86.40	400.00	96.00	9.60
	5.3 Sprays	0.275	435.00	119.63	475.00	130.63	11.00
6	Irrigation:						
	6.1 Canal	15.19	-	863.00	-	863.00	0.00
	6.2 Private tubewell	2.61	425.00	1109.25	475.00	1239.75	130.50
	6.3 Private canal (manual labour)	2.43	40.00	97.20	50.00	121.50	24.30
	6.4 Labour for irrigation and water course cleaning (m.days)	7.953	250.00	1988.25	300.00	2385.90	397.65
7	Farm Yard Manure:						
	7.1 Material	-	-	1315.00	-	1600.00	285.00
	7.2 Transport & application	-	-	1080.00	-	1275.00	195.00
8	Fertilizers: (bags)						
	8.1 DAP	0.83	2600.00	2158.00	4000.00	3320.00	1162.00
	8.2 Urea	1.97	815.00	1605.55	1190.00	2344.30	738.75
	8.3 Nitrophos	0.33	1750.00	577.50	2700.00	891.00	313.50
	8.4 CAN	0.13	720.00	93.60	1000.00	130.00	36.40
	8.5 Fert. transport and application	3.26	45.00	146.70	60.00	195.60	48.90
9	Mark up @ 12.0 % per annum for 15 months months on item 1 to 8 minus item 6.1	-	-	3790.79	-	4901.18	1110.39
10	Land rent for 15 months	-	14500	18125.00	24000.00	30000.00	11875.00
11	Average weighted land tax @ Rs 75/acre/ annum for 15 months	-	-	94.00	-	94.00	0.00
12	Management charges for 15 months	-	-	1217.00	-	1870.00	653.00
13	Harvesting & stripping (40 kg units)	585.46	12.50	1683.20	12.50	1683.20	0.00
14	Expected escalation in cost of selected items	-	-	1580.00	-	2503.00	923.00
15	Total cost (items 1 to 14)	-	-	52624.95	-	74588.95	21964.00
16	Yield (40 kg units)	-	-	585.46	-	585.46	0.00
17	Cost of productionat farm level: (Rs/40 kgs)						
	17.1 including land rent	-	-	89.89	-	127.40	37.52
	17.2 excluding land rent	-	-	58.93	-	76.16	17.23
18	Marketing expenses: (Rs/40 kgs)						
	18.1 Transport, etc.	-	-	10.00	-	12.00	2.00
	18.2 Development cess	-	-	0.27	-	0.27	0.00
19	Cost of production at mill-gate: (Rs/40 kgs)						
	19.1 including land rent	-	-	100.16	-	139.67	39.52
	19.2 excluding land rent	-	-	69.20	-	88.43	19.23

Notes for Annex - III to V

1. The input-output parameters for estimating cost of production for sugarcane 2011-12 Crop have been adopted from the Price Policy Report for sugarcane 2010-11 Crop, API's Series No. ___.

2. The hiring rates of farm operations, input prices, wage rates, land rentals and charges for harvesting and stripping have been revised in light of the data obtained through mini field surveys conducted by the API in the major sugarcane growing areas of the Punjab, Sindh and KPK during January 2011and discussion in the meeting of the Standing Committee on sugarcane, held on 12th February 2011 at Islamabad and other sources as narrated below:

3. 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 KPK 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.

4. Wide-ranging variation in the prices of sugarcane was noticed during course of field survey because of high prices on account of short production. Keeping in view the situation, seed prices have been adjusted accordingly.

5. The cost of supplementary irrigation has been adjusted in view of the increases in the prices of diesel and power tariff rates. Based on the ratios of electric and diesel tube-wells of 10:90 in the Punjab, 23:77 in Sindh and 71:29 in KPK as reported in the Agriculture Statistics of Pakistan, 2008-09, MINFA (Economic Wing), Islamabad. The average weighted increase has been estimated as 12.0 per cent in the Punjab, 11.88 per cent in Sindh and 11.76 per cent in the KPK.

6. The prices 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 7th April, 2011 and supplemented with information provided by the representatives of the farmers' in the meeting of Standing Committee on sugarcane.

7. 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. 12452 per month for a Field Assistant at the 10th stages in BPS-6 as per revised scale of July 2010.

8. 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 KPK. The expenditure on account of harvesting and stripping has been adjusted accordingly.

9. The likely escalation in the cost of operations like interculture, plant protection, supplementary irrigation, nitrogenous fertilizer, harvesting/stripping and marketing during 2011-12 crop year has been estimated as 19.85 per cent in the Punjab, 18.80 per cent in Sindh and 18.40 per cent in KPK on the basis of average weighted annual increase in their costs for the last 4 years.

10. Land rent is the major item in the cost of cultivation of sugarcane in all the provinces. It is influenced by several parameters and considerably varies from region to region. There is no clear-cut measure available at hand for updating the land rentals. However, keeping in view the observations obtained during the field survey of sugarcane and discussion made in the meeting of API's Standing Committee on sugarcane, land rentals have been adjusted accordingly.

Annex- VI

PER CAPITA AVAILABILITY (CONSUMPTION) OF SUGAR: 2007-08 to 2009-10 (OCTOBER-SEPTEMBER)

S. No	Items	2007-08	2008-09	2009-10
		----------------Thousands tonnes-------------		
1	Opoening stocks as on Ist October	986	1189	900
2	Production	4752	3188	3100
3	Imports	28	230	505
4	Export	28	24	0
5	Closing stocks as on 30th September	1,189	900	334
6	Net availability (item 1+2+3-4-5)	4549	3683	4171
7	Population	173.3	176.92	179.84
8	Per capita availability (consumption)	26.25	20.82	23.19
9	Average per capita availability Average (2007-08 to 2009-10)		23.42	

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

Sources:

1. For Stocks and Production: ALMA and TCP.
2. For Imports and Exports: FBS, Karachi.
3. For Population of Pakistan: Economic Survey of Pakistan.
4. For Population of AJ&K and NAs:
5. For Population of Afghan refugees:

ANNEX- VII.

DOMESTIC AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR DOMESTIC MARKETS: 2010 AND 2011

Month	Lahore	Fasilabad	Karachi	Hyderabad	Peshawar	Average
	------------------------- Rupees per 100 kgs------------------------------					
2010						
January	6415	6370	6268	6260	6420	6347
February	6595	6553	6480	6353	6603	6517
March	6208	6135	6068	6015	6180	6121
April	5930	5890	5788	5730	5923	5852
May	5888	5838	5708	5665	5878	5795
June	6193	6130	6033	5985	6205	6109
July	6520	6473	6478	6335	6558	6473
August	7153	7123	6875	6910	7310	7074
September	7903	7853	7665	7610	7943	7795
October	8060	8020	7878	7773	8223	7991
November	8175	8220	8350	8498	8973	8443
December	6900	6900	7375	7333	7498	7201
Average	**6828**	**6792**	**6747**	**6705**	**6976**	**6810**
2011						
January	7043	6895	6763	6758	6945	**6881**
February	6431	6210	6225	6116	6308	**6258**
Average	**6737**	**6553**	**6494**	**6437**	**6626**	**6569**

Source: ALMA, Karachi

ANNEX - VIII

AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR DOMESTIC MARKETS: 2000-01 TO 2010-11 (October- September)

Year	Lahore	Fasilabad	Karachi	Hyderabad	Peshawar	Average	Increase(+) decrease(-) in average price over
	------------------------- Rupees per 100 kgs					-------------------------------	Percent
2000-01	2551	2524	2482	2353	2566	2495	-
2001-02	2069	2042	2063	2022	2073	2054	-17.69
2002-03	1939	1906	1892	1872	1972	1916	-6.70
2003-04	1813	1769	1788	1743	1853	1793	-6.42
2004-05	2417	2410	2373	2345	2411	2391	33.35
2005-06	3359	3342	3243	3223	3349	3303	38.14
2006-07	2932	2901	2884	2818	2933	2894	-12.40
2007-08	2444	2410	2390	2346	2473	2413	-16.63
2008-09	4049	3997	3998	3938	4090	4014	66.39
2009-10	6203	6161	6138	6084	6276	6173	53.76
2010-11 (Oct- Feb)	7322	7249	7318	7295	7589	7355	19.16

Source: ALMA, Karachi

ANNEX - IX

AVERAGE INTERNATIONAL PRICES OF SUGAR: 2000-01 to 2010-11 (OCT-SEP)

Years Oct - Sep	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$/ tonne	US Cents/ lb	US$/ tonne	US Cents/ lb	US$/ tonne	Per cent of White Sugar
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	144.84	10.16	223.93	3.59	79.09	35.33
2004-05	8.97	197.75	12.48	275.06	3.51	77.31	28.13
2005-06	14.84	327.14	18.34	407.75	3.50	80.61	19.10
2006-07	10.43	229.90	14.80	326.82	4.38	96.92	29.55
2007-08	12.38	273.02	15.62	344.44	3.24	71.42	20.73
2008-09	15.42	340.02	18.94	417.56	3.52	77.54	18.57
2009-10	20.41	450.03	26.07	574.68	6.33	139.44	19.90
2010-11	27.65	609.66	33.35	735.23	5.70	125.57	17.08
October	24.61	542.55	30.98	682.98	6.37	140.43	20.56
November	26.35	580.91	32.63	719.36	6.28	138.45	19.25
December	27.98	616.84	33.91	747.57	5.93	130.73	17.49
January	29.61	652.78	34.94	770.28	5.33	117.50	15.25
February	29.72	655.20	34.29	755.95	4.57	100.75	13.33

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

ANNEX-X

IMPORT PARITY PRICES OF SUGARCANE AT MILL-GATE ON THE BASIS OF FOB (LONDON) PRICE OF WHITE SUGAR

S.No	Item	February, 2011		2010- 11 (Oct-Feb)		During 2007-08 to 2009-10	
		---------- US $ per tonne ----------					
1.	Average fob (London) price	755.95		735.23		445.56	
2.	Freight charges upto Karachi	60		60		60	
3.	C & f cost at Karachi port	816		795		506	
4.	Exchange rate (Rs/$)	85.33		85.33		85.33	
		---------- Rs per tonne ----------					
5.	C & f cost at Karachi port (Pak rupees)	69625		67857		43139	
6.	Marine insurance @ 0.20 % of c & f cost	139		136		86	
7.	**Cif cost at Karachi port**	**69764**		**67993**		**43226**	
8	**Incidetal charges incured on imported sugar(Annex-XII)**	**3593**		**3539**		**3000**	
9	Ex-mill/ market cost of imported sugar	73357		71532		46226	
10	Processing cost of sugar @Rs 8 per kg	8000		8000		8000	
11	Profit @Re 1 per kg	1000		1000		1000	
12	GST @Rs 2.31 per kg	2310		2310		2310	
13	Net value of raw material **(sugarcane)**	**62046.83**		**60222**		**34916**	
		Punjab	**Sindh**	**Punjab**	**Sindh**	**Punjab**	**Sindh**
14	Sugar recovery **(Percent)**	8.91	9.54	8.91	9.54	8.91	9.54
15	Quantity of cane in tonnes to produce one one tonne of sugar (100 / item 16)	11.22	10.48	11.22	10.48	11.22	10.48
16	Price of one tonne of sugarcane(item 15/item 17)	5528	5919	5366	5745	3111	3331
17	Value of by product molasses(1.8 kgs @ Rs 10.38/kg)	18.68	18.68	18.68	18.68	18.68	18.68
18	Import parity price of sugarcane **(Rs/40 kgs)**	239.81	255.45	233.31	248.49	143.12	151.92

Sources:

i) For average fob (London) price: Annex IX

ii) For freight, incidentals and duties: Trading Corporation of Pakistan, Karachi.

ANNEX-XI

EXPORT PARITY PRICES OF SUGARCANE AT MILL-GATE ON THE BASIS OF (FOB LONDON) PRICES OF WHITE SUGAR

S.No	Item	February, 2011		2010- 11 (Oct-Feb)		During 2007-08 to 2009-10	
		US $ per tonne					
1.	Average fob (London) price	755.95		735.23		445.56	
2.	Exchange rate (Rs/$)	85.33		85.33		85.33	
		Rs. per tonne					
3.	Average fob Karachi price (assuming equivalent to fob London price)	64505		62737		38020	
4.	Transport charges from interior Sindh to port, special packing, inspection transit insurance, loading and unloading, clearing and forwarding agents commission	1000		1000		1000	
5.	Wharfage	54		54		54	
6.	Bank commission @ 1 % of fob price	645		627		380	
7.	Pre- shipment inspection charges@ 0.5% of fob price	323		314		190	
8.	Ex-mill price of sugar (item 3 minus items 4 through 7)	62484		60742		36395	
9.	Processing cost of sugar @RS 8 per kg	8000		8000		8000	
10.	Prifit @ Re 1 per kg	1000		1000		1000	
11.	GST @Rs 2.31 per kgs	2310		2310		2310	
12.	Net value of raw material (sugarcane)	**51174**		**49432**		**25085**	
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
13.	Sugar recovery **(Percent)**	8.91	9.54	8.91	9.54	8.91	9.54
14.	Quantity of cane in tonnes to produce one tonne of sugar (100 / item 13)	11.22	10.48	11.22	10.48	11.22	10.48
15.	Price of one tonne of sugarcane (item 12/ item 14)	4560	4882	4404	4716	2235	2393
16.	Value of by product molasses(1.8 kgs @ Rs 10.38/kg)	18.68	18.68	18.68	18.68	18.68	18.68
17.	Export parity price of sugarcane **(Rs/40 kgs)**	201.06	213.96	194.86	207.31	108.08	114.41

Sources:

i) For average fob (London) price: Annex IX.

ii) For incidentals and duties: Trading Corporation of Pakistan, Karachi.

ii) For transport charges: Arian Cargo Transport Agensy, Karachi.

ANNEX- XII

MIL-GATE PRICES OF SUGARCANE WORKED BACK FROM THE EXPECTED WHOLESALE MARKET PRICES OF OF SUGAR DURING 2010-11

S.No	Item	WORKED BACK PRICES OF SUGARCANE							
		Rupees per tonne							
1.	Average wholesale market prices of sugar (a)	50000		60000		70000		80000	
2.	Whole sale dealer margin @5% on net price	2271		2747		3223		3700	
3.	Sales tax @ of Rs 2.31/kg	2310		2310		2310		2310	
4.	Net price of sugar (items 1-2-3)	45419		54943		64467		73990	
5	Processing cost of saugar @ Rs 8/kg	8000		8000		8000		8000	
6	Development and market fee	700		700		700		700	
7	Profit @Re 1 per kg	1000		1000		1000		1000	
8	Net value of raw material **(sugarcane)**	**35719**		**45243**		**54767**		**64290**	
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
9.	Sugar recovery **(Percent)**	8.91	9.54	8.91	9.54	8.91	9.54	8.91	9.54
10.	Quantity of cane in tonnes to produce one tonne of sugar (100 / item 9)	11.22	10.48	11.22	10.48	11.22	10.48	11.22	10.48
11.	Price of one tonne of sugarcane (item 8 / item 10) (Rs per tonne)	3183	3408	4031	4316	4880	5225	5728	6133
12.	Price of 40 kgs of cane (item 11/25)	127.30	136.30	161.25	172.65	195.19	208.99	229.13	245.33
13.	Value of by product molasses(1.8 kgs @ Rs 10.38/kg)	18.68	18.68	18.68	18.68	18.68	18.68	18.68	18.68
14.	**Sugarcane price at millgate**	**146**	**155**	**180**	**191**	**214**	**228**	**248**	**264**

ANNEX - XIII

ECONOMICS OF SUGARCANE AND COMPETING CROPS AT PRICES REALIZED BY THE GROWERS: 2010-11 CROP

S #	Province/crops/crop combination	Crop duration	Water used	Gross cost	Cost of purchased inputs	Gross revenue	Gross margin	Net income	Output-input ratio	Revenue per Rupee of purchased inputs	Revenue per Crop day	Revenue per Acre inch of water used
		Days	Acre inches	.....Rupees per acre........					Ratio	......Rupees......		
	1	2	3	4	5	6	7=6-5	8=6-4	9=6/4	10=6/5	11=6/2	12=6/3
	Punjab											
1	Sugarcane	394	48	51728	17450	93108	75658	41380	1.80	5.3	236	1940
2	Seed cotton	240	22	29996	11339	61858	50518	31862	2.06	5.5	258	2812
3	Basmati paddy	180	58	26652	13838	31983	18146	5332	1.20	2.3	178	551
4	IRRI paddy	180	62	24029	11918	32646	20729	8618	1.36	2.7	181	527
5	Wheat	180	12	24953	9746	28206	18460	3252	1.13	2.9	157	2350
6	Sunflower (spring)	180	22	21935	6281	29670	23389	7735	1.35	4.7	165	1349
7	Seed cotton + wheat	420	34	54949	21085	90063	68978	35114	1.64	4.3	214	2649
8	Seed cotton + sunflower	420	44	51931	17620	91528	73907	39597	1.76	5.2	218	2080
9	Basmati paddy+wheat	360	70	51605	23583	60189	36606	8584	1.17	2.6	167	860
10	Basmati paddy+sunflower	360	80	48587	20119	61653	41535	13067	1.27	3.1	171	771
11	IRRI paddy + wheat	360	74	48982	21663	60852	39189	11870	1.24	2.8	169	822
12	IRRI paddy+sunflower	360	84	45964	18199	62316	44118	16353	1.36	3.4	173	742
	Sindh											
1	Sugarcane	488	71	62328	20704	118087	97383	55759	1.89	5.7	242	1663
2	Seed cotton	240	18	27896	9580	63315	53735	35419	2.27	6.6	264	3518
3	IRRI paddy	180	56	22282	8842	34916	26074	12633	1.57	3.9	194	623
4	Wheat	180	12	22287	8563	24703	16140	2416	1.11	2.9	137	2059
5	Sunflower (spring)	180	22	21664	6269	29670	23401	8006	1.37	4.7	165	1349
6	Seed cotton + wheat	420	30	50184	18143	88018	69875	37835	1.75	4.9	210	2934
7	Seed cotton + sunflower	420	40	49561	18143	92985	74842	43424	1.88	5.1	221	2325
8	IRRI paddy+ wheat	360	68	44569	17405	59619	42214	15049	1.34	3.4	166	877
9	IRRI paddy+sunflower	360	78	43946	15111	64586	49475	20639	1.47	4.3	179	828

Notes for Annex – XIII – Economics of sugarcane and competing crops

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2009-10 crops.

2. The data regarding input-output parameters have been adopted from the API's policy Analysis Reports for sugarcane, seed cotton, rice paddy and wheat, 2009-10 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 2009-10 crops. To incorporate the escalations in input prices, which occurred during the growing period of 2009-10 crops, some marginal revisions have been made as under:

   2.1 The cost of fertilizers has been revised in view of their prices prevailed at the time of application for the respective crops in 2009-10 season.

   2.2 Harvesting and threshing charges have been revised in view of post harvest market price of wheat during 2009-10.

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

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

   4.1 The wholesale average market prices of wheat during the post harvest period of 2009-10 have been adopted at Rs 877 per 40 kgs for Punjab and Rs 857 for Sindh.

   4.2 The wholesale market prices of basmati paddy and IRRI paddy during the post harvest period of 2009-10 in major producer area markets have averaged at Rs 1000 and Rs 600 per 40 kgs, respectively.

   4.3 The wholesale market prices of seed cotton during the post-harvest months of Aug - Feb 2009-10 in the main producer area markets have averaged at Rs 1916 per 40 kgs in the Punjab. In Sindh, the corresponding prices are averaged at Rs 1903 per 40 kgs.

   4.4 The wholesale market prices of sunflower during 2009-10 reported by PODB are averaged at Rs. 1679 per 40 kgs in the Punjab and Rs. 1711 in Sindh. The corresponding prices for canola are averaged at Rs. 1657 and 1490 per 40 kgs, respectively.

   4.5 The market prices of sugarcane at mill-gate during 2009-10 in the major cane producing areas are reported to hover around Rs 150 per 40 kgs in the Punjab and Rs. 160 in Sindh.

5. The market prices have been adjusted for the marketing expenses to make them effective at the farm level. These expenses amount to Rs 8. 75 per 40 kgs in Punjab and Rs 8. 82 in

Sindh for sugarcane, Rs 26 in Punjab and Rs 28 in Sindh for seed cotton, Rs 22 for rice paddy, 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 in acre inches.

ANNEX-XIV

IMPACT OF RISE IN SUGAR PRICE ON AVERAGE HOUSEHOLD EXPENDITURE

Sugar price	Expenditure on sugar at average per capita availability of 23.42 kgs per year		Rise in expenditure	
	Per person	Per household	Per person	Per household
Rs per 40 kg	--------------- Rupees per year ----------------			
60 (Base price)	1405	9485		
61	1429	9643	24	158
62	1452	9801	47	316
63	1475	9959	70	474
64	1499	10117	94	632
65	1522	10276	117	791
66	1546	10434	141	949
67	1569	10592	164	1107
68	1593	10750	188	1265
69	1616	10908	211	1423
70	1639	11066	234	1581

Note: Average size of Household comprises 6.75 members.

Annex- XV

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

Description	Revenue	Traded Cost	Domestic Factor's Cost	Profits
		---------Rupees per acre---------		
Punjab				
2007-08				
Private Prices	35000	11467	17511	6021
Social Prices	37481	10501	16819	10162
Transfers	-2481	966	693	-4140
2008-09				
Private Prices	60991	14772	19894	26325
Social Prices	82891	13354	18856	50680
Transfers	-21900	1418	1038	-24355
2009-10				
Private Prices	93552	16105	26766	50680
Social Prices	115960	14587	25165	76209
Transfers	-22409	1519	1601	-25528
2010-11				
Private Prices	97488	12090	42104	43294
Social Prices	137648	11488	35886	90274
Transfers	-40160	602	6218	-46979
Sindh				
2007-08				
Private Prices	50024	15802	20580	13642
Social Prices	45529	14745	22568	8215
Transfers	4495	1056	-1988	5427
2008-09				
Private Prices	73008	17808	23036	32164
Social Prices	68736	16221	25003	27511
Transfers	4272	1587	-1967	4653
2009-10				
Private Prices	114920	18261	28574	68086
Social Prices	144286	16701	30116	97469
Transfers	-29365	1559	-1542	-29383
2010-11				
Private Prices	123370	20012	43171	60187
Social Prices	174205	19738	42848	111619
Transfers	-50835	273	[illegible]	-51432