

API SERIES NO. 253



# **SUGARCANE POLICY ANALYSIS**

## **FOR**

### **2015-16 CROP**



**AGRICULTURE POLICY INSTITUTE**  
**MINISTRY OF NATIONAL FOOD SECURITY AND RESEARCH**  
**GOVERNMENT OF PAKISTAN**  
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## SUMMARY FOR THE PROVINCES -----SUGARCANE PRICE POLICY OPTIONS FOR 2015-16 CROP

The Agriculture Policy Institute (API) is responsible for recommending indicative price of sugarcane every year for Punjab, Sindh and Khyber Pukhtunkhawa provinces. These provinces hold meetings of their respective Sugarcane Control Board annually to discuss and approve API recommended indicative price of sugarcane with provincial stakeholders. The Provincial Sugarcane Commissioners are responsible to implement the announced price of sugarcane in their respective provinces.

### LIKELY PRICE POLICY OPTIONS

2. Agriculture Policy Institute (API) conducted rigorous analysis for determining Indicative Price for Sugarcane 2015-16 crop. Results of the analysis are given below:-

Indicative Price Policy Options Based on	Sugarcane price at mill gate (Rs. per 40 Kgs)	
	Punjab / KPK	Sindh
1. Cost of production of sugarcane	164.16 Punjab 165.92 KPK	164.18
2. Indicative price for 2015/16 crop assuming average wholesale prices of sugar:-	<u>138.07</u>	<u>143.12</u>
a) Rs 55,000 per ton	131.25	122.38
b) Rs 60,000 per ton	143.18	133.50
c) Rs 65,000 per ton	155.12	144.63
3. Price received by cane growers for 2014-15 crop	165	155
4. Import Parity based on average fob London price of white sugar at US \$ 354.95 / ton (June 2015)	126.96	118.37
5. Export Parity based on: average fob London price of white sugar at US \$ 354.95/ ton (June 2015)	89.67	83.61

### PRICE RECOMMENDATIONS

3. In 2013 growers of sugarcane could not get indicative price announced by the Provincial Governments. Consequently they reduced area of sugarcane especially in Punjab province which resulted in less production. Thus production target was not met.

This led the Government of Punjab increase indicative price to Rs. 180/40 kgs for 2014-15 crop. Response from sugarcane growers was very positive and cultivation of sugarcane increased in the province.

4. In Sindh situation was normal, area and production both increased due to increasing demand of sugarcane from newly established sugar mills in the upper Sindh. Government of Sindh initially announced sugarcane price as Rs. 182/40 kgs but later withdrew it and announced Rs 155/40 kgs which was rejected by the growers. They approached the Sindh High Court. The Court advised to enhance the price to Rs. 172/40 Kgs -adding Rs.17/40 Kgs to the earlier price.

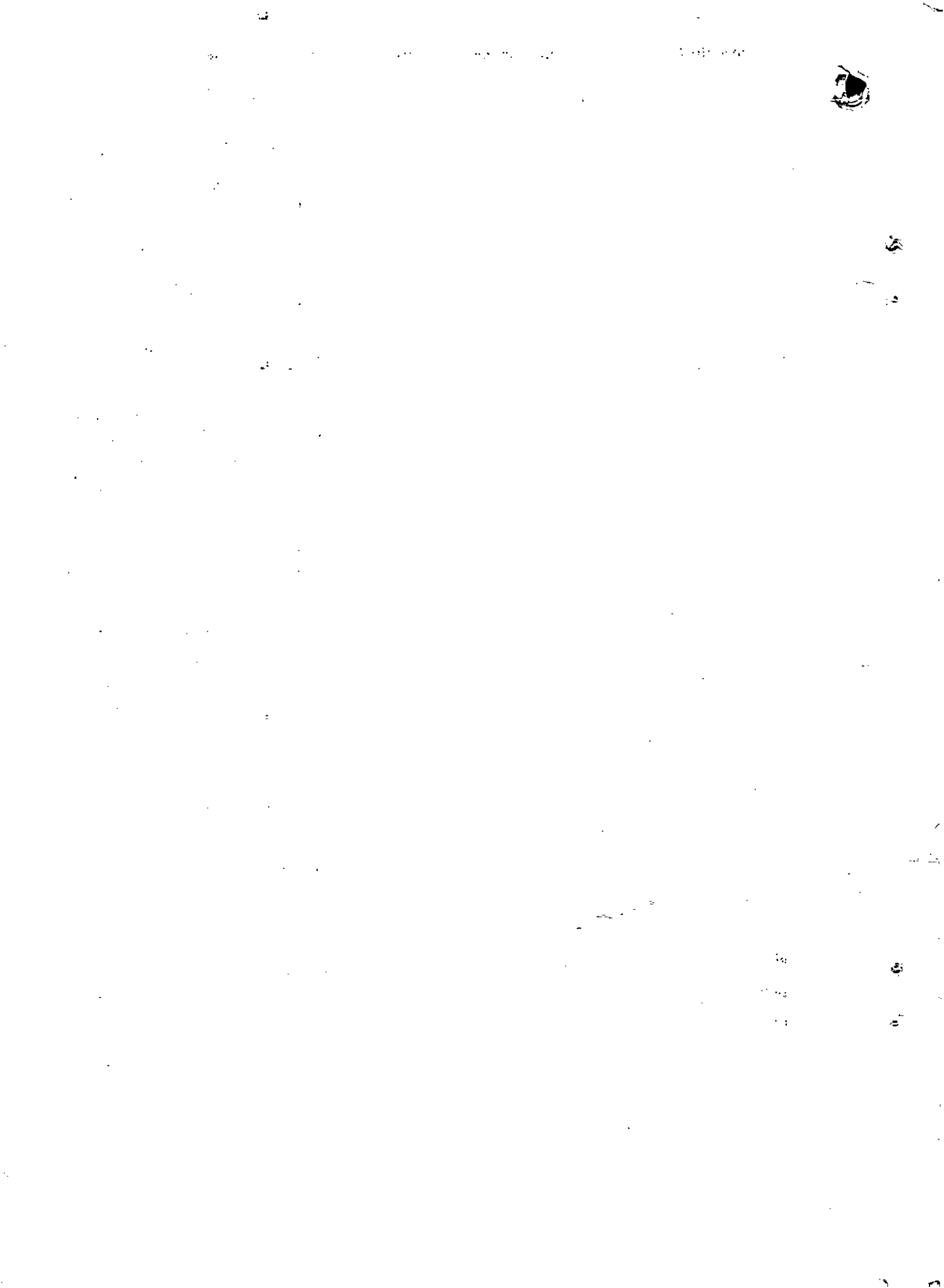
5. On the other hand, at national level all sugar mills were unable to export surplus stock of sugar due to continuously declining international price of sugar and faced very serious liquidity crunch to clear farmers' dues. The sugar mills demanded to reduce the indicative price to make Pakistani sugar competitive in the international market and enable sugar mills to make payments to growers in time.

6. Sugarcane growers demanded that government should reduce cost of sugarcane production by removing GST on agriculture inputs.

7. Keeping in view the prevailing scenario and the analysis of different economic parameters such as cost of production, export parity prices of sugar, prices of sugarcane realized by the growers during 2014-15 and domestic and international market prices of sugar are suggestive of not increasing prices of sugarcane in Punjab and KPK, however, for Sindh it is strongly recommended that Indicative Price of Sugarcane for 2015-16 crop should be fixed at Rs. 182/40 kgs.

#### **NON PRICE RECOMMENDATIONS**

8. The issues relating to sugarcane production, domestic marketing problems and low international sugar price viz a viz export have been discussed in detail in the API meeting where the participants unanimously suggested that Ministry of Industries must allow more export of sugar and Ministry of Commerce should do extraordinary efforts to promote sugar export. They must help the sugar exporters in exploring new markets for export of sugar.



## 1. INTRODUCTION

Sugarcane is very important crop of Pakistan, but due to persistent rise in input prices, sugarcane area, yield and production in 2014-15 remained less than the previous year. As a result, farmers' got indicative price announced by the Government of Punjab and KPK, however, the dispute of sugarcane price in Sindh could not be resolved. Initially Government of Sindh announced price of sugarcane at Rs 182/40 kgs but later it was revised and fixed at Rs. 155/40 kgs which was rejected by the farmers especially in Lower Sindh. In the Upper Sindh farmers sold their cane to sugar mills adjacent to Punjab where they received Rs 180/40 kgs.

2. Farmers' cost of production is continuously increasing. Consequently sugarcane production could not remain a viable option for the farmers. They tried to move to more profitable crops like sunflower, maize and potatoes. Government of Punjab watched the situation and accepted the recommendations of the Agriculture Policy Institute and announced sugarcane price at Rs. 180/40 kgs. In Sindh crop estimates were showing a positive trend and government thought that post-harvest price will come down and farmers will be willing to sell their cane at Rs. 155/40 kgs but it did not happen. Farmers approached to Sindh High Court and got the decision in their favour and the Court decided and advised to pay Rs. 17/40 kgs more to growers. It is reported through media that till 5<sup>th</sup> October the issue of price in Sindh was not settled between the stakeholders in Sindh.

3. In the Agriculture Policy Institute's annual meeting for sugarcane farmers from Sindh requested the Minister for Ministry of National Food Security and Research to intervene in the matter and help the sugarcane farmers of Lower Sindh. The Minister promised to talk to Leader of the opposition in National Assembly on the issue and directed API to monitor the situation closely and play an impartial role and conduct price analysis for the next crop more carefully and in a fair manner.

4. The Agriculture Policy Institute sent its team to conduct a mini field survey in the main sugarcane producing areas of Sind. The team reported farmers' dissatisfaction on the price announced by the Government of Sindh and demanded a reasonable increase in indicative price of sugarcane. Government of Sindh has also desired that Agriculture Policy Institute must help the sugarcane stakeholders to get out of the price dilemma.

5. Keeping in view the whole scenario and after analysing different policy options, Agriculture Policy Institute prepared a price policy analysis report for 2015-16 sugarcane crop and presented its recommendations to the Provincial Governments. The recommendations and the analysis is given in the following sections of their report.



## 2. SUGARCANE PLANTING AND HARVESTING SEASONS

6. Sugarcane is a tropical crop which requires temperature 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 of 8 to 10 months for sugarcane in a year. The recommended times of planting the spring and autumn crops by province are given in table-1.

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

Province	Planting Time	
	Spring crop	Autumn crop
Punjab	15 <sup>th</sup> February to 3 <sup>rd</sup> week of March	September
Sindh	1 <sup>st</sup> February to 15 <sup>th</sup> March	September to 15 <sup>th</sup> October
NWFP	15 <sup>th</sup> February to 3 <sup>rd</sup> week of March	September
	Harvesting Time	
Punjab, Sindh, KPK	15 <sup>th</sup> October to 1 <sup>st</sup> March	

Source: Sugarcane Coordinator, NARC, Islamabad.

## 3. PROVINCIAL SHARES OF AREA AND PRODUCTION

7. Shares of area and production of sugarcane during the period 2004-05 to 2006-07 and 2012-13 to 2014-15 and changes therein are presented in table-2 below:

**Table-2: Comparison of Provincial Shares in Area and Production of Sugarcane: 2004-05 to 2006-07 and 2012-13 to 2014-15**

Country/Province	Area			Production		
	2004-05 to 2006-07	2012-13 to 2014-15	Change	2004-05 to 2006-07	2012-13 to 2014-15	Change
	----- Per cent -----					
Pakistan	100.0	100.0	-	100.0	100.0	-
Punjab	68.3	64.9	-4.9	67.9	65.8	-3.0
Sindh	21.1	25.2	19.5	22.6	26.3	16.2
KPK	10.6	9.8	-7.5	9.5	7.9	-17.1
Baluchistan	0.0	0.1	20.2	0.04	0.05	15.7

Source: Worked out from Annex-I&II.

8. It is clear from table-2 that Punjab, Sindh and KPK share 64.9, 25.2 and 9.8 percent in area and 65.8, 26.3 and 7.9 per cent in production. Over time, the share of Punjab has gone down by 4.9 per cent in area and 3.0 per cent in production. In case of Sindh, the area share has gone up by 19.5 per cent and that of production has also gone up by 16.2 per cent. In KPK, area has gone down by 7.5 per cent and production by 17.1 per cent. Provincial shares are also depicted in Figures 1 to 4.

#### 4. IMPORTANT SUGARCANE PRODUCING DISTRICTS

9. Sugarcane is a high delta crop. It is grown in irrigated conditions. Districts which grow 100 thousand tons or more of sugarcane are R.Y.Khan, Faisalabad, Sargodha, Jhang, Muzaffargarh, T.T.Singh, Chiniot, Kasur, Rajanpur, M.B.Din, Bahawalpur, Bhakkar, Vehari, Nankana Sahib, Bahawalnagar, Layyah, Okara, Khanewal, Khushab, D.G.Khan, Sahiwal, Hafizabad, Multan, Pakpattan, Mianwali, Sheikhpura, Lodhran, and Gujrat, in the Punjab; Badin, Thatta, Nawabshah, Tando Muhammad Khan, Ghotki, N.Feroze, MirpurKhas, TandoAllahyar, Khairpur, Sanghar, Matiari, Hyderabad, Sukkur, Dadu, and Unerkot from Sindh; Charsadda, Mardan, D.I.Khan, Peshawar, Nowshera, Malakand and Swabi from KPK. These 50 districts; 28 from the Punjab, 15 from Sindh and 7 from KPK collectively account for 99 per cent of the sugarcane's area and production (Annex-III).

10. However, 24 districts, namely, R.Y.Khan, Faisalabad, Sargodha, Jhang, Muzaffargarh, T.T.Singh, Chiniot, Kasur, Rajanpur, M.B.Din, Bahawalpur, Bhakkar, Vehari, Badin, Thatta, Nawabshah, Tando Muhammad Khan, Ghotki, N.Feroze, MirpurKhas, TandoAllahyar, Khairpur, Charsadda and Mardan collectively produce 83 per cent of the total sugarcane produced in the country.

#### 5. CHANGES IN AREA, YIELD AND PRODUCTION

11. During the decade ending 2014-15 area under sugarcane at country level ranged between 907.5 to 1241.3 thousand hectares (2242.4 to 3067.4 thousand acres) production from 44.666 to 67.460 million tons and yield oscillated between 48.62 to 57.54 tons per hectare (Annex-II).

12 Long-term and short-term changes in area, yield and production of sugarcane are discussed below:

##### 5.1 Long-term Changes: 2004-05 to 2014-15

13. During the period under discussion, sugarcane production increased @ 3.2 per cent per annum mainly due to improvement in yield @ 1.5 per cent and 1.6 per cent per annum expansion in area (table-3).

14. Sugarcane production in Punjab, during the period under reference, has increased @ 3.1 per cent per annum because of 1.9 per cent improvement in yield and 1.2 per cent expansion in area. Sugarcane production in Sindh has also increased @ 4.2 per cent due to 3.0 and 1.1 per cent expansion in area and yield respectively. In KPK, sugarcane production has increased @ 0.9 per cent per annum mainly due to an increase in area.

**Table-3: Average Annual Growth Rate of Area, Yield and Production of Sugarcane:  
2004-05 to 2014-15**

Country/Province	Area	Yield	Production
	Per cent per annum		
Pakistan	1.6	1.5	3.2
Punjab	1.2	1.9	3.1
Sindh	3.0	1.1	4.2
KPK	0.9	0.04	0.9
Baluchistan	4.5	0.7	5.2

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

## 5.2 Short-term Changes: 2013-14 and 2014-15 Crops

15. According to the estimates of the Provincial Agriculture Departments, sugarcane production at country level for 2014-15 crop is reported at 62.826 million tons reflecting a decrease of 6.9 per cent over last year's production of 67.460 million tons. The decrease in production is mainly due to 2.7 and 4.3 per cent contraction in area and yield respectively (table-4).

**Table-4: Area, Yield and Production of Sugarcane: 2013-14 and 2014-15 Crops**

Country/ Province	Area		Chang -es	Yield		Chang -es	Production		Chang -es
	2013-14	2014-15		2013-14	2014-15		2013-14	2014-15	
	000 ha		Per cent	tons per ha		Per cent	000 tons		Per cent
Pakistan	1172.5	1140.5	-2.7	57.5	55.1	-4.3	67460.1	62826.4	-6.9
Punjab	756.8	710.6	-6.1	57.7	57.8	0.1	43704.0	41074.0	-6.0
Sindh	297.6	316.7	6.4	61.7	52.5	-15.0	18362.5	16613.8	-9.5
KPK	117.4	112.5	-4.2	45.7	45.4	-0.6	5361.4	5107.0	-4.7
Baluchistan	0.7	0.7	-1.5	48.1	47.9	-0.4	32.2	31.6	-1.9

Source: Annex-II.

16. According to the final estimate of sugarcane crop for the year, 2014-15, production in Punjab was reported at 41.074 million tons as compared to 43.704 million tons for the previous year which shows a decrease of 6.0 per cent. The decline is mainly due to 6.1 per cent decrease in area. However yield shows a slightly increase of 0.1 per cent over the last year.

17. Sugarcane production during 2014-15 in Sindh decreased by 9.5 per cent over the previous year, from 18.363 to 16.614 million tons. The decrease was attributed to 15.0 per cent reduction in yield.

18. In the KPK and Baluchistan, the production also decreased by 4.7 and 1.9 per cent due to 4.2, 1.5 and 0.6, 0.4 decrease in area and yield respectively.

19. Provincial Agricultural Departments have provided following reasons for changes in area, yield and production.

### 5.3 Reasons for Decline in Area and Production in Punjab and Sindh

20. In Punjab less economic return received from last year produce as compared to other crops (Rice and Cotton). This discouraged the growers to bring more area under crop. Disposal problems of cane and delayed payments also restricted the acreage of sugarcane.

21. In Sindh area of sugarcane crop increased due to greater cultivation of sugarcane in upper Sindh particularly in Ghotki due to installation of new sugar mills. Due to late start of Sugar Mills and also dispute over the price of sugarcane, crop cutting operations delayed, harvested crop also caused weight loss due to indent problem. Insufficient rainfall in Sindh province also resulted in weight loss of the cane.

## 6. TARGETS VS ACHIEVEMENTS: 2014-15 CROP

22. The Federal Committee for Agriculture (FCA) fixed sugarcane production target for 2014-15 crop at 65.472 million tons. As per final estimates of the Provincial Agriculture Departments sugarcane production is reported at 62.826 million tons (4.0 per cent less than the target) due to below achievement of 1.7 and 2.3 per cent in area and yield (table-5). In the provinces of the Punjab, Sindh and Baluchistan sugarcane production lagged the targets by 4.5, 5.1 and 7.1 per cent while in the KPK, it exceeded by 3.4 per cent.

**Table-5: Targets and Estimated Achievements of Area, Yield and Production of Sugarcane: 2014-15 Crop**

Country/ Province	Area		Deviation from the target	Yield		Deviation from the target	Production		Deviation from the target
	Target	Achieve- ment		Target	Achieve- ment		Target	Achieve- ment	
	--- 000 ha ---		Per cent	Tons/ha		Per cent	-- 000 tons --		Per cent
<b>Pakistan</b>	<b>1160.7</b>	<b>1140.5</b>	<b>-1.7</b>	<b>56.4</b>	<b>55.1</b>	<b>-2.3</b>	<b>65472.0</b>	<b>62826.4</b>	<b>-4.0</b>
Punjab	750.0	710.6	-5.3	57.3	57.8	0.8	43000.0	41074.0	-4.5
Sindh	300.0	316.7	5.6	58.3	52.5	-10.1	17500.0	16613.8	-5.1
KPK	110.0	112.5	2.3	44.9	45.4	1.1	4938.0	5107.0	3.4
Baluchistan	0.7	0.7	-5.7	48.6	47.9	-1.4	34.0	31.6	-7.1

Sources: 1. For targets: Targets have been fixed by respective Provincial Agriculture Departments

2. For achievements: Annex-II.

## 7. SUGARCANE YIELD AMONG COMPETING COUNTRIES

23. Global sugarcane during 2013 occupied an area of around 26089 thousand hectares with a total production of 1877105 thousand tons. The world top 10 producing countries contribute 81 percent of total area and 83 percent of total production as given in table-6.

24. In terms of sugarcane area Brazil is on the top with 9835 thousand hectares followed by India with 5050 thousand hectares and China with 1819 thousand hectares. Pakistan lies at 5<sup>th</sup> number in this regard with 3.4 percent share.

**Table-6: MAJOR SUGARCANE PRODUCING COUNTRIES AREA OF THE WORLD 2013 CROP**

S. No.	Country	Area (000) ha	Per cent Share in World area
1	Brazil	9835	39.38
2	India	5060	18.18
3	China, mainland	1819	6.69
4	Thailand	1122	5.33
5	Pakistan	1129	3.4
6	Mexico	738	3.26
7	Indonesia	450	1.86
8	Philippine	435	1.80
9	Colombia	406	1.70
10	Argentina	370	1.49
11	Total 10 countries	21609	81.0
	World Total	26523	100.00

Source: World Statistics Year Book 2013

25. In terms of sugarcane production, Brazil is on the top with 739267 thousand tons followed by India with 341200 thousand tons and China with 125536 thousand tons. However, Pakistan retains 5<sup>th</sup> position in sugarcane production of the world (table-7).

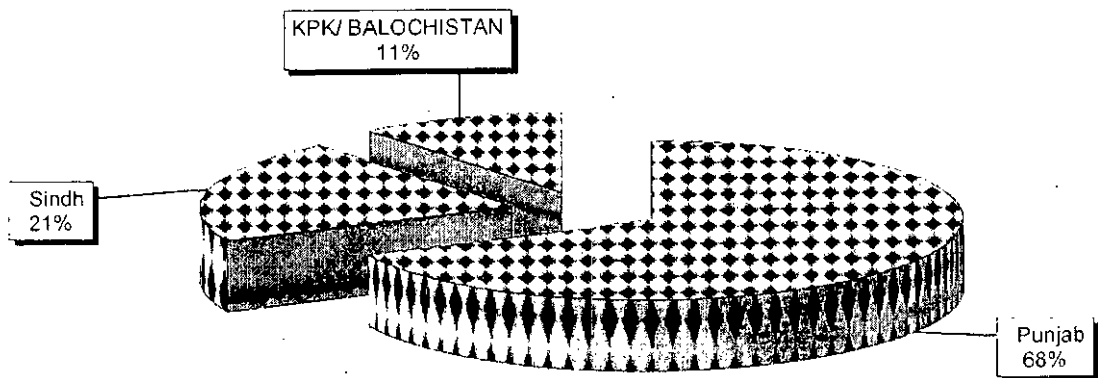
**Table-7: MAJOR SUGARCANE PRODUCING COUNTRIES PRODUCTION AS %AGE OF THE WORLD: 2013 CROP**

S. No.	Country	Production in (000) tons	Per cent Share in World Production
1	Brazil	739267	39.38
2	India	341200	18.18
3	China, mainland	125536	6.69
4	Thailand	100096	5.33
5	Pakistan	63750	3.4
6	Mexico	61122	3.26
7	Colombia	34876	1.86
8	Indonesia	33700	1.80
9	Philippine	31874	1.70
10	United State of America	27906	1.49
11	Total 10 countries	1559387	83.09
	World Total	1877105.0	100.00

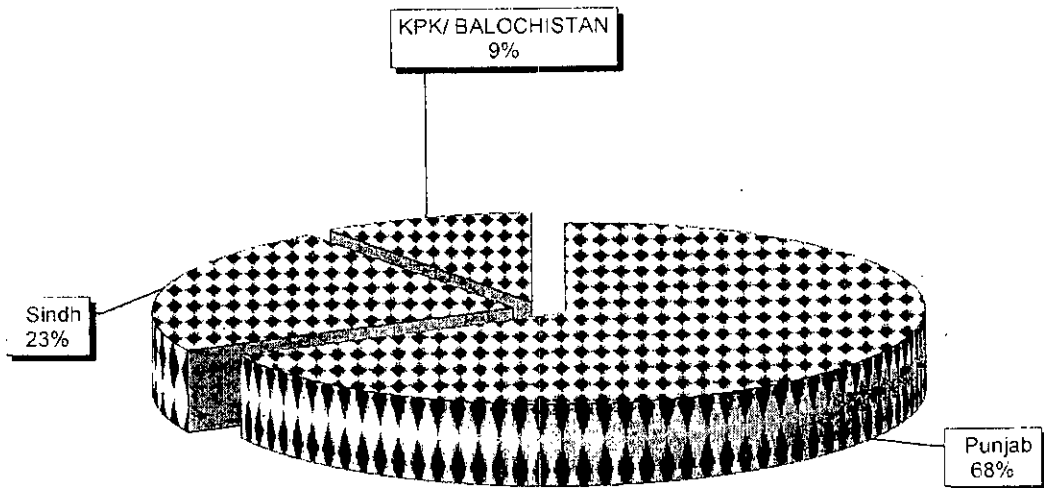
Source: World Statistics Year Book 2013

26. In terms of yield per hectare, Peru lies at the top with 133.72 tons per hectare followed by Ethiopia with 119.57 and Egypt with 115.33 tons per hectare. It is an alarming situation that Pakistan ranks at 51 in terms of yield at 56.5 tons per hectare while India lies at 40 positions with 67 tons per hectare. However, the world average yield of sugarcane is approximately 71 tons per hectare (Table 8).

**PROVINCIAL SHARES IN AREA AND PRODUCTION OF SUGARCANE:  
AVERAGE OF 2004-05 TO 2006-07**

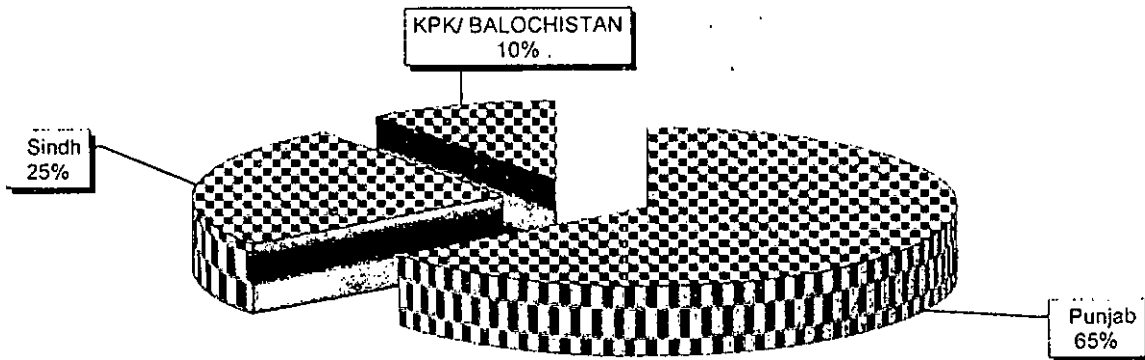


**FIG-1: SHARES IN AREA**

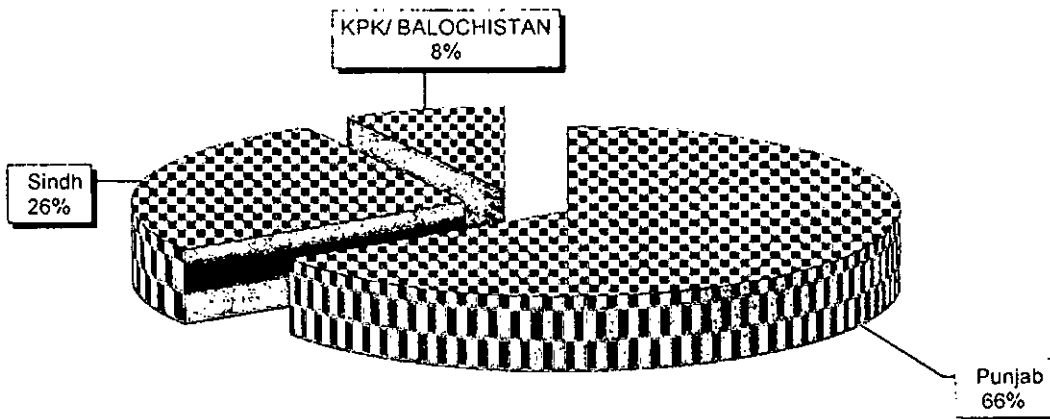


**FIG-2: SHARES IN PRODUCTION**  
SOURCE: TABLE-2

**PROVINCIAL SHARES IN AREA AND PRODUCTION OF SUGARCANE:  
AVERAGE OF 2012-13 TO 2014-15**



**FIG-3: SHARES IN AREA**



**FIG-4: SHARES IN PRODUCTION**  
SOURCE: TABLE-2

**Table:8 MAJOR SUGARCANE PRODUCING COUNTRIES YIELD OF THE WORLD:2013 CROP**

S. No.	Country	Yield (tons/ha)
1	Peru	133.72
2	Ethiopia	119.57
3	Egypt	115.33
4	Senegal	114.10
5	Malawi	107.41
6	Zambia	102.56
7	Burkina Faso	102.13
8	Guatemala	100.70
9	United Republic of Tanzania	100.00
10	Nicaragua	98.18
<b>World average</b>		<b>70.77</b>

Source: World statistics year book 2013

## 8. SUGARCANE CRUSHED AND SUGAR MADE IN PAKISTAN

27. As evident from table 9, the overall sugarcane produced and crushed, sugar production and recovery have increased remarkably during last 5 years. On Pakistan's basis during 2013-14, sugarcane crushing was 56.46 million tons, higher by 12.7 per cent compared with 50.09 million tons of previous year. Sugar production has increased to 5.59 million tons, 11.3 per cent more than produced during 2012-13. Recovery declined to 9.90 per cent in the same year from 10.04% in 2012-13. The main reason of improvement in sugar production was sugarcane producers' cultivated improved varieties and the supply was regular without any disturbance. Irrespective of traditional differences between farmers and millers, the overall sugar sector scenario was better than that of the previous year. Cane utilization has also increased compared with previous year.

**Table-9: -Sugarcane and Sugar Produced and Cane Utilization in Pakistan**

Year	Cane Produced	Cane Crushed	Cane Utilized by Mills	Sugar Made	Percent Recovery	No. of Mills
	Mil. Tons	Mil. Tons	%	Mil. Tons	%	
2009-10	49.37	34.61	70.09	3.13	9.05	83
2010-11	55.44	44.53	80.47	4.17	9.37	84
2011-12	58.04	48.25	83.13	4.67	9.64	86
2012-13	63.72	50.09	79.00	5.03	10.04	86
2013-14	67.43	56.46	84.00	5.59	9.90	88

Source: Pakistan Sugar Mills Associations.

## 9. COST OF PRODUCTION

28. In outlining price proposals for farm produces, the cost of production (COP) is one of the significant considerations. However, its empirical estimation involves various problems and practical hindrance on account of wide variations in agro-climatic conditions and farming systems under which the crop is grown-up. In case of sugarcane, the dilemma is further





intricate as fresh and ratoon crops i.e. spring and autumn are raised with different duration and farming practices follow-on varying use of inputs and yield level.

### 9.1 Cost of Production of Sugarcane by Province

29. The cost of production of sugarcane for the 2015-16 Crop in the Punjab, Sindh and Khyber Pakhtunkhwa have been analysed by adopting the input-output parameters as used in calculating COP estimates for the 2014-15 crop and the latest prices of various farm inputs and custom hiring rates of cultural operations. These rates were collected through annual field survey conducted by the API in the major sugarcane producing areas of the Punjab and Sindh during Jan-Feb 2015. The detailed cost estimates are presented in Annex IV to VI, while summary of the results is given in table-10.

**Table 10: Average Farmer Cost of Production of Sugarcane:  
2014-15 and 2015-16 Crops**

Items	Unit	Cost estimates		Increase in 2015-16 over 2014-15
		2014-15 Crop	2015-16 Crop	
<b>Punjab</b>				
1. Cost of cultivation	Rs/acre	83313	84297	9843
2. Yield	40 kgs/acre	565.15	565.15	-
3. Cost of production at farm level	Rs/40 kgs	147.42	149.16	1.74
4. Marketing cost	"	15.00	15.00	-
5. Cost of production at mill-gate	"	162.42	164.16	1.74
<b>Sindh</b>				
1. Cost of cultivation	Rs/acre	99541	101311	1770
2. Yield	40 kgs/acre	676.02	676.02	-
3. Cost of production at farm level	Rs/40 kgs	147.25	149.86	2.62
4. Marketing cost	"	14.32	14.32	-
5. Cost of production at mill-gate	"	161.57	164.18	2.62
<b>KPK</b>				
1. Cost of cultivation	Rs/acre	87757	88627	1877
2. Yield	40 kgs/acre	585.46	585.46	-
3. Cost of production at farm level	Rs/40 kgs	149.89	151.38	1.49
4. Marketing cost	"	14.54	14.54	-
5. Cost of production at mill-gate	"	164.43	165.92	1.49

Source: Annex IV to VI.

#### Punjab

30. The cost of raising one acre of sugarcane in the Punjab during 2015-16 crop season is likely to be Rs. 84297, including land rent (Table 10). Based on the average yield of 565 maunds (40 kgs) per acre, the cost of production at farm level comes to Rs 149.16 per 40 kgs. Weighing up marketing expenses @ Rs 15.00 per 40 kgs, the cost of sugarcane at mill-gate would be Rs 164.16 per 40 kgs, higher by Rs 1.74 (1.07 per cent) than the parallel cost estimates of 2014-15 crop.

#### Sindh

31. During 2015-16 crop season, the cost of cultivation of sugarcane in Sindh works out to Rs. 101311 per acre, including land rent. The farm level cost of production of sugarcane is

estimated at Rs 149.86 per 40 kgs, based on an average yield of 676 maunds per acre. Accounting for marketing expenses including cane development cess @ Rs 14.32 per 40 kgs, the mill-gate cost of production would be Rs 164.18 per 40 kgs, higher by Rs 2.62 (1.62 per cent) than the corresponding cost of Rs. 161.57/40 kgs of previous year.

### **Khyber Pakhtunkhwa**

32. In Khyber Pakhtunkhwa, cost of rising sugarcane during 2015-16 crop year is estimated at Rs 88627 per acre, including land rent. Based on an average yield of 585 maunds (40 kgs) per acre, the cost of production works out at Rs 151.38 per 40 kgs. Adding transportation charges including sugarcane development cess @ Rs 14.54 per 40 kgs, the mills-gate cost would come to Rs 165.92 showing an increase of Rs 1.49 per 40 kgs or 0.90 per cent over last year's corresponding cost of Rs 164.43/40 kgs.

33. The trifling enrichment in COP of sugarcane in all provinces has been generally rising in lieu of cost of fertilizers and rental charges. While there is no major increase in cost of other item because of decrease in the prices of diesel. The effects of decline in prices of diesel in agriculture sector on custom hiring rates i.e. ploughing, tube well irrigation etc, was discussed in the API Standing Committee meeting. However, it was reported that there had been no significant downwards intrude in the agriculture sector and hence operational costs of most operations are more or less at last year level.

## **9.2 Cost of major operations/inputs**

34. The shares of major operations and farm inputs in the total cost of cultivation of sugarcane for 2014-15 and 2015-16 crops in the Punjab, Sindh and KPK are shown in the table- 11.

### **Punjab**

35. Land rent is the major component of the cost of cultivation of sugarcane in the Punjab for 2015-16 crop, contributing 31 per cent. Other major ingredients are: fertilizers including FYM (15 %), land preparation (10 %) and irrigation (11 %), seed/sowing operations & harvesting and stripping (9 % each).

### **Sindh**

36. In Sindh major components of the cost of cultivation of sugarcane during 2015-16 crop year are: land rent (25 %), fertilizer including FYM (17 %), seed and sowing operations (13 %), land preparation (11 %), harvesting and stripping (9 %).

### **Khyber Pakhtunkhwa**

37. Land rent is the major constituent of the cost of cultivation of sugarcane for the 2015-16 crop in KPK, contributing 40 per cent. Other constituents are fertilizer including FYM (13 %), seed & sowing operation (12 %), irrigation 70% and land preparation (6 %) and interculture (5 %).

**Table-: 11 Cost of major operations/inputs of Sugarcane: 2014-15 and 2015-16 Crops**

Operations/inputs	2014-15 crop	2015-16 crop	Item specific change as % of change in total cost
	Rs/acre		
<b>Punjab</b>			
1. Land preparation	8835 (11)	8835 (11)	0.0
2. Seed and sowing operations	7455 (9)	7455 (9)	0.0
3. Intercultural and earthing-up	2258 (3)	2258 (3)	0.0
4. Plant protection	331 (1)	366 (1)	3.6
5. Irrigation	8371 (10)	8371 (10)	0.0
6. Fertilizer including FYM	11639 (14)	12242 (15)	61.4
7. Land rent	24917 (30)	26000 (31)	110.1
8. Harvesting and stripping	7273 (9)	7273 (9)	-
9. Others	12235 (15)	11497 (15)	- 75.0
<b>Total cost</b>	<b>83313 (100)</b>	<b>84297 (100)</b>	<b>100.0</b>
<b>Sindh</b>			
1. Land preparation	11174 (11)	11174 (11)	0.0
2. Seed and sowing operations	13379 (13)	13379 (13)	0.0
3. Intercultural and earthing-up	4541 (5)	4541 (5)	0.0
4. Plant protection	448 (1)	489 (1)	2.3
5. Irrigation	4070 (4)	4070 (4)	0.0
6. Fertilizer including FYM	16686 (17)	17481 (17)	44.9
7. Land rent	24000 (24)	25333 (25)	75.3
8. Harvesting and stripping	8788 (9)	8788 (9)	0.0
9. Others	16455 (17)	16056 (17)	-22.5
<b>Total cost</b>	<b>99541 (100)</b>	<b>101311 (100)</b>	<b>100.0</b>
<b>KPK</b>			
1. Land preparation	5437 (6)	5437 (6)	0.0
2. Seed and sowing operations	10847 (12)	10847 (12)	0.0
3. Intercultural and earthing-up	4815 (5)	4815 (5)	0.0
4. Plant protection	569 (1)	613 (1)	2.3
5. Irrigation	5717 (7)	5717 (7)	0.0
6. Fertilizer including FYM	11141 (13)	11501 (13)	19.2
7. Land rent	35000 (40)	36250 (40)	66.6
8. Harvesting and stripping	1751 (2)	1751 (2)	0.0
9. Others	12480 (14)	11697 (14)	-90.1
<b>Total cost</b>	<b>87757 (100)</b>	<b>88627 (100)</b>	<b>100.0</b>

Notes: 1 "Others" include mark-up, management, land tax, drainage cess and expected escalation in the cost of selected items. Figures in parenthesis are per cent shares in total cost. Rounding off figures may result in slight differences.

## 10. NOMINAL AND REAL INDICATIVE / MARKET PRICES OF SUGARCANE

38. The Real price of a commodity is the price achieved by removing the inflationary effect from its nominal price. The resultant price of that commodity reflects its real value. It represents increase or decrease in purchasing power of the respective commodity against the base year level. In the following text, an analysis of the indicative and market prices of sugarcane has been carried out. This analysis is based on the prices of sugarcane in 2010-11 to 2014-15. Discussion below indicates the province-wise trends in nominal and real terms.

## 10.1 Nominal and Real Indicative and Market Prices of Sugarcane in Punjab

39. The analysis of indicative and market prices of sugarcane for the Punjab province during 2010-11 to 2014-15 is given in the table-12:

**Table- 12 : Nominal and Real Indicative & Market Prices of Sugarcane Realized by the Growers in the Punjab: 2010-11 to 2014-15**

Crop year	Nominal Prices		Consumer Price Index (CPI) 2007-08=100	Real Prices	
	Indicative *	Market **		Indicative	Market
	---- Rs per 40 kgs ----			---- Rs per 40 kgs ----	
1	2	3	4	5=(2/4)x100	6=(3/4)x100
2010-11	125	175	146.45	85.35	119.49
2011-12	150	148	162.57	92.27	91.04
2012-13	170	170	174.53	97.40	97.40
2013-14	170	170	188.07	90.39	90.39
2014-15	180	180	197.74	91.03	91.03

Notes: \* Indicative price of sugarcane at mill-gate fixed by the Provincial Government.  
 \*\*Prices of sugarcane actually realized by the growers reported during the API field survey.  
 Sources: - 1. Price Policy Report for Sugarcane by API (various issues).  
 2. Pakistan Economic Survey, 2014-15.

40. Nominal indicative price of sugarcane in the Punjab increased by 44% per cent from Rs 125 to Rs 180 per 40 kgs between 2010-11 to 2014-15. During the same period, the Consumer Price Index (CPI), the most commonly used measure of inflation in the economy, escalated by 35.4%. Thus a consistent growth is observed in real indicative prices of sugarcane up to 2012-13. However, the prices thereafter do not show any regular pattern. For the last year 2014-15, real indicative price of sugarcane works out to be Rs 91.03 per 40 kgs. The Real indicative price was lower than the nominal price since 2010-11.

41. As far as the nominal market price of sugarcane is concerned, it has declined gradually from Rs.175 per 40 kgs in 2010-11 to Rs 170 per 40 kgs in 2013-14 but increased again in 2014-15. However, the real market price presents also a depressing situation which remained below the nominal market price throughout the period under review.

## 10.2 Nominal and Real Indicative and Market Prices of Sugarcane in Sindh

42. The nominal and real indicative and market prices of sugarcane in Sindh for the period 2010-11 to 2014-15 are displayed in table-13:

43. Nominal Indicative prices in Sindh increased from Rs 125 per 40 kgs in 2010-11 to Rs 182 per 40 kgs in 2014-15. This counts to 45.6 per cent increase. Market price usually remained higher than the indicative price except in the last two years when it marginally fell against the indicative price. It proves that indicative price of sugarcane is not a distortion in the market conditions. Indicative Price in real terms increased from Rs. 85 per 40 kgs to Rs.

92 per 40 kgs during 2010-11 to 2015-15. However, the real market price remained higher than indicative price during the same period.

**Table-13: Nominal and Real Indicative & Market Prices of Sugarcane Realized by the Growers in Sindh: 2007-08 to 2014-15**

Crop year	Nominal Prices		Consumer Price Index (CPI)	Real Prices	
	Indicative *	Market**		Indicative	Market
	---- Rs per 40 kgs ----		2007-08=100	---- Rs per 40 kgs ----	
1	2	3	4	5=(2/4)x100	6=(3/4)x100
2010-11	125	185	146.45	85.35	126.32
2011-12	154	154	162.57	94.73	94.73
2012-13	172	174	174.53	98.55	99.70
2013-14	172	169	188.07	91.46	89.86
2014-15	182	180	197.74	92.04	91.02

**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.

**Sources:** - 1. Price Policy Report for Sugarcane by API (various issues).  
2. Pakistan Economic Survey, 2014-15.

44. As far as the nominal market price of sugarcane is concerned, it declined gradually from Rs.185 per 40 kgs in 2010-11 to Rs 169 per 40 kgs in 2013-14 but increased again in 2014-15 to Rs. 180 only in upper Sindh. However, the real market price presents also a depressing situation which remained below the nominal market price throughout the period under review. It is clear from Table-13 above that the changes in indicative and real prices of sugarcane is more stable during the period 2010-11 through 2014-15.

45. It may be observed from the above data that CPI consistently increased during the reference period, Nominal prices have also evidenced a continuous improvement in nominal terms. It increased from Rs 172 per 40 kgs in the 2013-14 to Rs 182 per 40 kgs in 2014-15. One striking feature of market prices is that it declined during 2011-12 and 2013-14 against the previous years, which reflects that market is not perfect and the growers may face a higher risk factor for losing returns from their produce.

### 10.3 Gains from Sugarcane Cultivation in Real Terms

46. The real indicative price has been lower than the nominal price since 2010-11 onwards both in the Punjab and Sindh. The major factor for this mismatch between the nominal and the real prices is attributed to the higher CPI which has been increasing constantly, thus pushing the real value/returns to a lower level. This indicates that sugarcane farmers have been getting less in real terms from the crop.

47. The real market price is found in consonance with the nominal market price declining 25% during 2011-12. However, since the nominal indicative price was increased against the last year by 23.2%, the corresponding real price improving by 11%. During the last year of analysis in 2014-15 both the indicative and market prices improved marginally in real terms.

48. It may be concluded from this analysis that indicative and market prices of sugarcane almost follow the same pattern which visibly implies successful implementation of indicative

price of sugarcane. However, field evidenced does not support these findings as a number of factors have been reported to undermine price actually received by the sugarcane growers. In nutshell indicative price is found to play its envisaged role in stabilizing the sugarcane prices.

## 11. COMPARATIVE ECONOMICS OF SUGARCANE AND COMPETING CROPS

49. 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.

50. 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 2014-15 crop year. Detail of the analysis is presented for the Punjab and Sindh provinces in Annex-..... A summary of analysis against various economic indicators is provided in table 14 and table 15 and results the analysis are briefly discussed in the following paragraphs.

### Punjab

51. The API field survey held in 2015 revealed that sugarcane growers, on the whole, received the indicative price. In respect of returns to overall investment, the sugarcane performed better than entire crop combinations. None of the combinations could compete with Sugarcane in terms of returns to purchased inputs and gross revenue per day of crop duration. Similarly, Sugarcane also out-competed both Basmati and IRRI combinations in terms of irrigation water. The cotton + wheat and cotton + sunflower rotations performed better than sugarcane while the sugarcane out competed rest of the combinations.

**Table -14 : Economics of Sugarcane and Competing Crops at Prices Realized by the Growers for 2014-15 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	1.25	3.96	237	1943
2. Cotton + wheat	1.04	2.98	235	2904
3. Cotton + sunflower	1.01	2.75	232	2219
4. Basmati + wheat	0.96	2.33	229	1176
5. Basmati + sunflower	0.93	2.15	226	1015
6. IRRI + wheat	0.92	2.30	207	1007
7. IRRI + sunflower	0.90	2.11	204	874

Source: Annex- VII

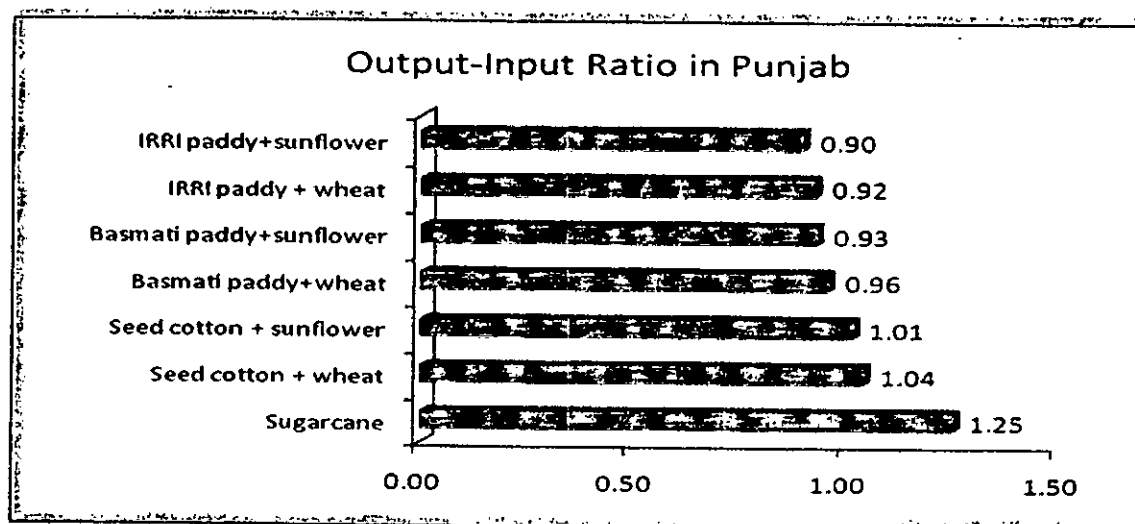


Fig-5: Output-Input Ratio of Sugarcane in Punjab

### Sindh

52. Sugarcane growers, in Sindh, have also been largely reported receiving the indicative price during 2014-15. However, in certain parts of the province, the price received by the farmers was much less than the indicative price. Based on the indicative price, the analysis presents that Sugarcane returned better than the competing crops, in terms of output-input ratio.

53. In terms of returns to crop duration, sugarcane performed low against cotton + wheat and cotton + sunflower combinations. However, returns to irrigation water for IRRi combinations remained lower than the sugarcane.

**Table - 15 : Economics of Sugarcane and Competing Crops at Prices Realized by the Growers for 2014-15 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	1.28	3.89	232	1597
2. Cotton + wheat	1.12	3.41	238	3338
3. Cotton + sunflower	1.08	3.41	239	2509
4. IRRi + wheat	1.12	3.16	236	1249
5. IRRi + sunflower	1.07	2.85	237	1092

Source: Annex-VII

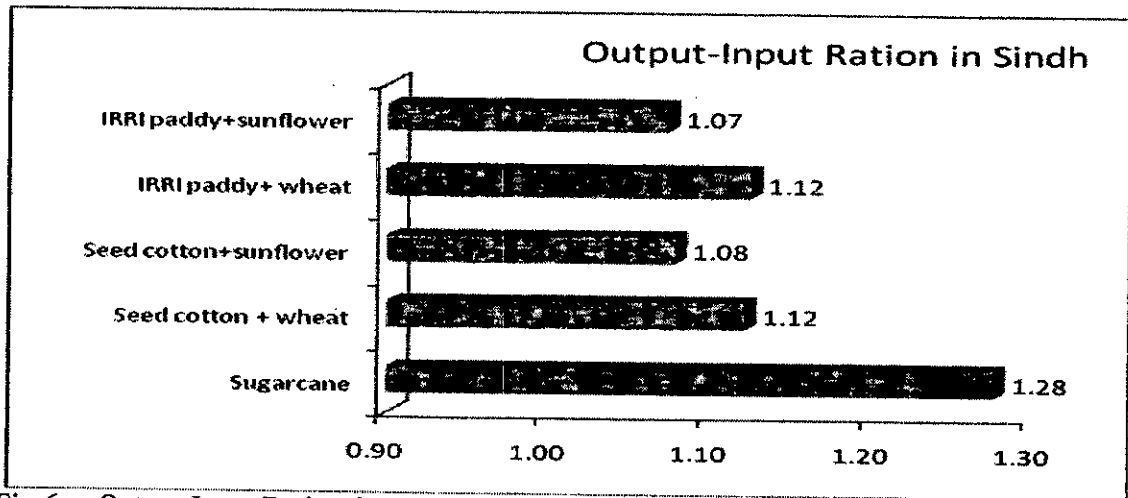


Fig-6 : Output-Input Ratio of Sugarcane in Sindh

### 11.1 Economics of Sugarcane: Inter Provincial Comparison

54. In view of its longer duration, sugarcane crop in the Sindh province requires more water and other inputs as compared to Punjab. The higher yield of Sindh by 20 percent over Punjab may be explained in terms of relatively greater use of inputs. The cost incurred on purchased inputs other than chemical fertilizers is relatively higher in Sindh as compared to the Punjab. Similarly, irrigation water is also applied on higher side in Sindh. The crop duration is relatively longer in Sindh as compared to Punjab

55. Chemical fertilizers are used on higher side in Sindh 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 6.3 per cent (Table-16).

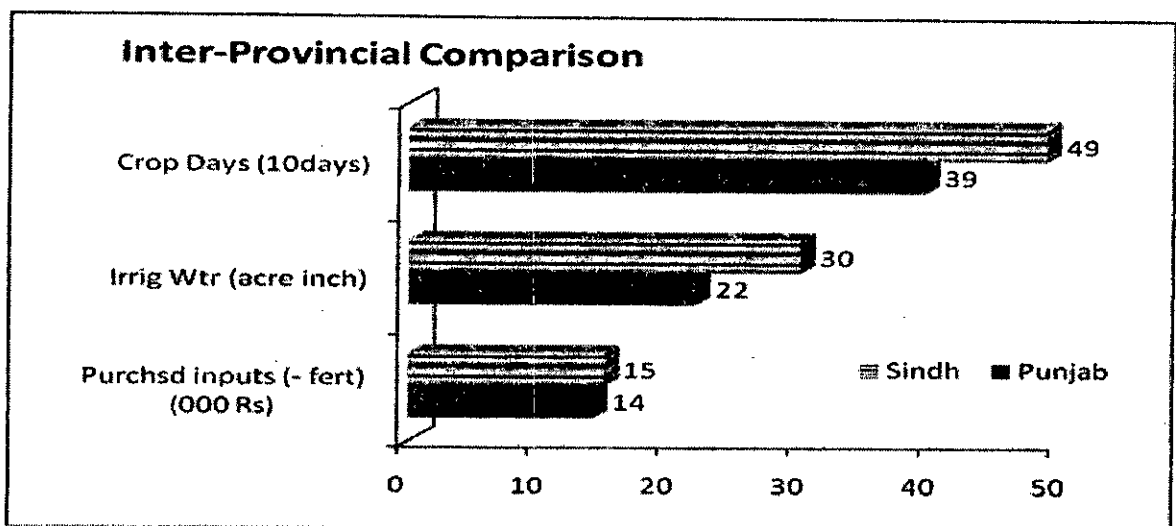


Fig-7: Inter-provincial Comparison



Table - 16 : Input Use Level and Yield of Sugarcane in Sindh Versus Punjab: 2014-15 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	15,061	14,171	6.3(+)
Fertilizer Use:				
• N	Nutrients kg/acre	104	56	86 (+)
• P	"	39	34	15 (+)
Crop yield	40 kg/ acre	676	565	20 +)

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

56. 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. A summary of the results is given in table-17 below.

### 12.1 Impact on CPI

57. The Pakistan Bureau of Statistics (PBS) has estimated the changes in CPI as a result of increase in sugar price over the base price. The impact of increase in sugar price on CPI is given in table 17.

Table 17: 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 @ 21.70 kgs per year	
		Per head	Per household
Rs per kg	Per cent	----- Rupees -----	
61 * (Base price)			
62	0.0030	23.98	157.79
63	0.0216	47.96	315.58
64	0.0403	71.94	473.37
65	0.0590	95.92	631.15
66	0.0776	119.90	788.94
67	0.0963	143.88	946.73
68	0.1147	167.86	1,104.52
69	0.1336	191.84	1,262.31
70	0.1523	215.82	1,420.10

Note: \* Price for the month of June 2015 was Rs 61.84/kg.  
Average size of household comprises 6.58 members.

Sources: Pakistan Bureau of Statistics (Prices Cell).

58. It is evident from the table 17 that every increase of rupee 1 per kg over the base price of Rs 61 per kg is expected to raise the CPI by 0.0030 per cent, other things remaining the

same. Accordingly, the CPI is likely to increase by 0.0216 and 0.0776 per cent, if sugar price is increased by Rs 2 and Rs 5 per kgs.

## 12.2 Impact on Household Expenditure

59. The annual per capita availability of sugar based on the Balance Sheet Method has averaged at 23.98 kgs during 2011-12 to 2013-14. In view of per capita sugar availability @ 23.98 kgs per annum and average household size of 6.58 members, the impact of selected increases in sugar price on the average household expenditure has been presented in Table above. It may be seen that every increase of Re 1 in sugar price over the base level of Rs 61 per kg would raise the CPI by 0.0030 per cent. In addition, the per head and average household expenditure would increase by Rs 23.98 and Rs 157.79 respectively per annum with rise in sugar price by Rs 1 per kg, other things remaining the same. Accordingly, an increase of Rs 2 and Rs 5 over the base level would increase the per head expenditure by Rs 47.96 and 119.90 per annum and average household expenditure by Rs 315.58 and Rs 788.94 per annum.

## Economic Efficiency in Sugarcane Production

### Under import situation

#### Nominal Protection Coefficient (NPC)

60. NPC is the ratio of domestic market price to the social price of a commodity. In turn social price is the import or export parity price of the respective commodity. NPC examines the impact of domestic market price of on viability of the crop without considering distortions in input prices. As a rule of thumb if NPC is greater than one it means that local producers get protection through pricing policy. On the other hand if NPC is less than one it means that domestic producers are implicitly taxed. Implicit taxation to the growers of a crop means flow of resources from that particular crop to undermine its development. It is evident from Table-18 that NPC values for Punjab steadily increased during the period 2010-11 to 2014-15. These range between 0.9 and 1.4. It implies that in 2010-11 and 2011-12 sugarcane growers were implicitly taxed in sugarcane production. Since 2012-13 onward price of sugarcane gradually increased and cane crop got protection for rest of the period under analysis. The same trend is observed for the Sindh province.

**Table-18 Nominal and Effective Protection Coefficients for Sugarcane in Pakistan (Import Scenario)**

Year	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)
	Punjab		Sindh	
2010-11	0.8	0.7	0.8	0.7
2011-12	0.9	0.8	0.9	0.9
2012-13	1.2	1.3	1.2	1.3
2013-14	1.3	1.4	1.2	1.2
2014-15	1.4	1.6	1.4	1.4

Source: Annex- VIII & IX .



### Effective Protection Coefficient (EPC)

61. EPC is the ratio of the difference between the gross revenue of the crop and the cost of tradable inputs at private prices and the difference between the gross revenue and tradable inputs' cost at social prices. Thus EPC is a measure of the net incentive/ disincentive of pricing policies of output and tradable inputs. EPC greater than one means that private profit is higher than it would be without government intervention in the input/ output market. In contrast EPC less than one indicates that net effect of input/ output pricing policies is reduction in private profits. In the former case there is protection to the producers of the commodity while in the later case they are implicitly taxed which discourages domestic production of the crop.

62. Table-18 also presents EPC estimates for sugarcane in Pakistan. EPC values for 2010-11 to 2014-15 show significant variations. Alike NPCs, EPCs also remained below one which implies more profits for sugarcane growers during first two years of analysis. From 2012-13 onward, EPC value suddenly increased to the level 1.3 in 2013/14 to 1.36 in 2014-15. The underlying reason is gradual increase in domestic prices of sugarcane after 2011-12. The same pattern of change is observed for the Sindh province.

### Domestic Resource Cost Coefficient

63. DRC is the ratio of the social cost of domestic factors i.e labor, management charges, land rent, mark up on capital Development Cess and harvesting charges, involved in sugarcane production to the value added at social prices. In the present context DRC is determined by dividing cost of domestic factors used in sugarcane production at social prices by the difference of the gross revenue and cost of tradable inputs at social prices. If DRC is less than one it implies comparative advantage in the crop and domestic production can save foreign exchange at costs less than the corresponding import cost of sugar. When DRC is greater than one, it indicates comparative disadvantage in domestic production of sugarcane as in such situation import of a sugar will be cheaper. However, it should be noted that DRC varies with changes in opportunity cost of non-tradable inputs as well as the social value of output. Based on cost of production of average farmer and import prices of sugar, DRCs for Punjab and Sindh are estimated and produced in Table-19. Relevant data on private and social profitability for the analysis period are produced in Annex-X and XI.

**Table - 19 Domestic Resource Cost Coefficient (DRC) for Sugarcane in Punjab and Sindh Provinces (import scenario)**

Year	DRC Coefficient (Punjab)	DRC Coefficient (Sindh)
2010-11	0.3	0.2
2011-12	0.6	0.5
2012-13	0.8	0.7
2013-14	0.9	0.7
2014-15	1.3	0.9

Source: Annex-X and XI.

64. It is visible from the DRC coefficients in the above Table that for most of the time Domestic Resource Cost Coefficients were below one except 2014-15 for Punjab which indicate Pakistan's comparative advantage in sugarcane production under import situation. In other words domestic resources cost would be less than the corresponding import expenditure

of sugar. There-fore, it would be an economic proposition to invest in sugarcane and sugar production at home than to import.

### Under export situation

65. Economic efficiency indicators for sugarcane production in Pakistan under export scenario are presented in Table-20. It may be seen from the NPC and EPC estimates that almost all of them are above one which indicate that sugarcane production for export of sugar is not a viable option for Pakistan. Imported sugar is cheaper than domestic sugar.

**Table - 20 Nominal and Effective Protection Coefficients for Sugarcane in Pakistan (export scenario)**

Year	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)
	Punjab		Sindh	
2010-11	0.9	0.9	0.9	0.9
2011-12	1.1	1.1	1.1	1.1
2012-13	1.5	1.9	1.6	1.8
2013-14	1.8	2.5	1.7	2.0
2014-15	2.1	3.6	2.0	2.6

Source: VIII and IX

66. So far as DRC values are concerned, principally if value of DRC is less than one it indicates that the crop has comparative advantage and vice versa. DRC values under export scenario are produced in Table-21. It may be seen from the data that DRC values are higher than one during 2012-13 onward both for Punjab and Sindh provinces. This means that for Pakistan export purpose production of sugarcane is not a viable option.

**Table - 21 Domestic Resource Cost Coefficient (DRC) for Sugarcane in Punjab and Sindh Provinces (export scenario)**

Year	DRC Coefficient (Punjab)	DRC Coefficient (Sindh)
2010-11	0.3	0.3
2011-12	0.8	0.6
2012-13	1.2	1.0
2013-14	1.7	1.1
2014-15	2.8	1.6

Source: X and XI.

67. Furthermore, due to continuously declining international price of sugar and relatively stable prices of sugarcane in Pakistan export parity price of sugarcane has significantly decreased due to which DRC coefficients have increased. This is an alarming sign for the policy makers to optimize sugarcane and sugar production in Pakistan. One of the options may be shifting to alternative crops than to expand cultivation of sugarcane.

## **14. WHOLESALE SUGAR PRICES IN DOMESTIC MARKET**

68. The monthly average wholesale prices of sugar in Karachi, Hyderabad, Lahore, Faisalabad and Peshawar markets during 2014 and 2015 (Jan - June) are presented Annex-XII, while for the last 13 years in Annex-XIII and XIV.

69. In 2014, average monthly wholesale prices recorded as minimum as Rs 4800 per 100 kgs in Karachi during the month of January and maximum at 6350 per 100 kgs in Hyderabad during September 2014. In 2015 (Jan-June), average monthly wholesale prices ranged between Rs 5000 per 100 kgs in Karachi market during January and Rs 5975 per 100 kgs in Peshawar market during June 2015. The overall average of sugar price at country level ranged between Rs 4928 to Rs 5918 per 100 kgs during 2014-15.

## **15. DOMESTIC DEMAND, SUPPLY, AND STOCK OF SUGAR**

70. The sugar production from 2014-15 (Oct-Sept) crop has been estimated at 5.151 million tons. Adding 0.493 million tons of leftover stocks from 2013-14, the total sugar supply for 2014-15 consumption year is estimated to 5.178 million tons. Based on average per capita availability of sugar estimated at 24.0 kg during 2012-14, total domestic requirement for a population of 198.32 million has been worked at 4.757 million tons for 2014-15. Thus, there is an estimated 0.914 million tons surplus sugar is available to the country for export during 2014-15. For detail see Annex-XV.

## **16. WORLD SUPPLY, DEMAND, STOCKS, TRADE AND PRICES OF SUGAR**

### **16.1 Supply, demand, stocks and trade**

71. The data on world balance sheet of sugar (raw equivalent) for the period of 2012-13 to 2014-15 are presented in table-22:

72. The world sugar production was estimated at 170.99 million tons during 2013-14, 1.04 million tons (0.61 per cent) lower than the last year level of 172.03 million tons. Accounting for the opening stocks of 77.31 million tons, global supply of sugar in 2013-14 were reported at 248.30 million tons (2.78 per cent) higher than 2012-13. The world consumption in 2013-14 was 22.15 per cent higher than the previous year. End year stocks in 2013-14 were estimated at 80.56 million tons, 4.20 per cent higher than last year.

73. World sugar production during 2014-15 is estimated at 173.63 million tons, 1.54 per cent higher than last year's production. Accounting for the opening stocks of 80.59 million tons, global supply of sugar in 2014-15 has been projected at 254.22 million tones 2.38 per cent higher than 2013-14. The world consumption in 2014-15 projected at 171.42 million tons, 2.15 per cent higher than last year. End year stocks remain high and expected to grow further during 2014-15 at 81.84 million tons.

**Table-22: World Balance Sheet of Sugar (Raw Equivalent):2012-13 to 2014-15 (Oct-Sept)**

S.No	Item	2012-13	2013-14	2014-15	Changes 2014-15 over 2013-14
		----- Million tons -----			Per cent
1.	Opening stocks	69.56	77.31	80.59	(+)4.24
2.	Production	172.03	170.99	173.63	(-)1.54
3.	Total supply (1+2)	241.59	248.30	254.21	(+)2.38
4.	Disappearance (consumption)	164.29	167.82	171.42	(+)2.15
5.	Stock Adjustment *	(+)0.01	(+)0.08	(-)0.96	
6.	Ending stocks	77.31	80.56	81.83	(+)1.59
7.	Trade (export)	60.53	56.52	56.80	(-)0.50

Note: \* Including adjustment for unknown net trade.

Source: Quarterly Market Outlook, International Sugar Organization, May 2015.

## 16.2 International Prices of Sugar

74. The international prices of raw (fob Caribbean ports) and white (fob London) sugar from 2001-02 to 2014-15 are presented in Annex-XV while their graphical movement shown in fig 7.

75. The prices of both raw and white sugar fluctuated widely during the period under review. During 2001-02, the prices of raw sugar averaging at US \$ 151.01 per tonne had increased to \$ 179.03 per tonne next year but again declined to \$ 144.84 per tonne during the 2003-04, the lowest level of price during the period under review. The price recovered sharply and jumped at \$ 327.14 per tonne in 2005-06 but again declined to \$ 229.90 in next year. From 2007-08 prices started upward trend and averaged at \$ 585.45 per tonne in 2010-11, and touched the highest level during the period under review. From 2011-12, prices started decreasing and reached \$ 384.02 per tonne during 2013-14. In the months of Oct - Jun 2014-15, prices ranged between \$ 369.71 per tonne (October 2014) to \$ 274.91 per tonne (June 2015). The prices of white sugar during the under reference period have almost followed similar pattern to those of raw sugar.

## 17. IMPORT AND EXPORT PARITY PRICES OF SUGARCANE

76. 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 past years and exporters in recent years, both the import and export parity prices of sugarcane have been worked out for analysing price policy options for the next crop season.

77. 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 Annexes-XVI and XVII, while the results are summarized in table-23.

**Table-23: Import/Export Parity Prices of Sugarcane as Worked Back from Average fob (London) Prices of Sugar**

Average fob London prices of white sugar per tonne	Sugarcane prices (Rs/40 kgs)	
	Punjab	Sindh
<b>Import parity</b>		
US \$ 354.95 (Jun 2015)	126.96	118.37
US \$ 388.80 (Oct 2014 to June 2015)	136.59	127.36
US \$ 532.45 (2011-12 to 2013-14)	177.47	165.47
<b>Export parity</b>		
US \$ 354.95 (Jun 2015)	89.67	83.61
US \$ 388.80 (Oct 2014 to June 2015)	98.85	92.16
US \$ 532.45 (2011-12 to 2013-14)	137.79	128.47

Source Annexes -XVI and XIX

### 18. MILL-GATE PRICES OF SUGARCANE BASED ON DOMESTIC WHOLE SALE PRICES OF SUGAR DURING 2014-15 CONSUMPTION YEAR

78. Sugarcane prices have also been estimated from the wholesale prices of sugar during the 2014-15 consumption year and presented in Table-24. This analysis is based on actual sucrose recovery as reported by the PSMA; processing cost of sugar and Federal Excise Duty @ 8 per cent. A summary of sugarcane prices estimated under this scenario from various wholesale prices of sugar is presented in table-24 while the details are given in Annex - XVIII.

**Table- 24: Sugarcane Prices Estimated from Expected Wholesale Prices of Sugar During 2014-15**

Wholesale prices of sugar (Rs /Tons)	Sugarcane prices (Rs/40 Kgs)	
	Punjab	Sindh
Rs 55000	131.25	122.38
Rs 60000	143.18	133.50
Rs 65000	155.12	144.63

### 19. SUGAR PRODUCTION IN 2014-15 AND FORECAST FOR 2015-16

79. In 2014-15 record production of sugarcane crop was reported by the crop reporting departments of the Provinces. It was a gratifying feature for the season placing the crop area of sugarcane at 1.141 million hectares with cane production of 62.826 million tons. The lower sugarcane production was due to non-payment of dues from sugar mills in 2013-14.

80. The sugar production from above crop by the close of the crushing season in March 2015 was reported to be 5.151 mln tons which is less than the estimates of 5.5 mln tons. However, production of sugar was above domestic needs of 4.757 mln tons for a population of 198.32 million at per capita requirement of 24 /kg. Sugar position for the year 2014-15 is as follows:

Sugarcane plantation	= 1.141 million hectares
Sugarcane produced	= 62.826
Sugarcane crushed	= 56.460 (Utilization 84 %)
Sugar produced from cane	= 5.151
Cary over Stock from 2013-14	= 0.493
Sugar availability for 2014-15	= 5.644
Domestic requirement 2014-15	= 4.757
Sugar Consumed till 07-10-2015	= 3.727
Sugar still in stocks 2015-16	= 1.944
Sugar needed for remaining period	= 0.397
Expected surplus sugar	= 1.517

## 20. SUGAR TRADE

81. Pakistan Sugar Mills Association (PSMA) had held several meetings with the Ministry of Industries, Commerce and National Food Security and pleaded their case of actual position of sugar production and surplus stocks and its timely disposal in order to improve the liquidity of the mills to pay the growers dues worth more than Rs, 200 bln. To enable the sugar mills to pay the grower's dues, the Government of Pakistan has allowed export of sugar as under:-

ECC decision dated September 07 2013	500,000 tons
ECC decision dated March 27, 2014	250,000 tons
ECC Total in 2013-2014	0.750 mln tons
ECC decision dated December 24, 2014	0.650 mln tons

82. The Government has been encouraging the mills for export in order disposed of the surplus before June 2014, however major impediment in the export of sugar was very tough global environment with depressed international sugar prices for past few years as well as the higher cost of sugar production in Pakistan. Apart from this, some of the mills could not utilize their allocated quota in the given time and usually renewed their quota by the close of cut off period which created further hindrance in smooth flow of export. With these permissions in hand the sugar mills were able to export 0.637 mln tons of sugar out of the total permitted quantity of 0.750 mln tons. Again keeping in view stocks pending for export with mills Government of Pakistan had to allow 0.650 million tons for export.

83. According to weekly Sensitive Price Index published by Pakistan Bureau of Statistics (PBS), the price of sugar in week ending on June 11, 2015 in the domestic market was Rs 61.57 per kg, registering an increase of 17% as compared to Rs 52.54 per kg in December 2014. It may be noted that according to the data provided by the Pakistan Bureau of Statistics during the current year 2014-15 (July-April), Pakistan imported 9,811MT of sugar at an average price of \$580.4 MT. On the other hand international prices of sugar in the world market has been declined from \$450 to \$360 per ton since the decision of the ECC of December 24, 2014 in which quota of 650,000 MT of sugar was allowed for export by



May 15, 2015. Owing to this scenario Pakistani sugar importers decided to import 600 MT of Indian sugar even at 20% regulatory duty. It was feared that if Indian sugar continues to influx into Pakistan at cheaper prices, stocks with local sugar mills will remain unsold. Consequently, payments of growers will not be cleared and the fate of cane growers will not be different from wheat growers.

84. Keeping in view this situation, the Pakistan Sugar Mills Association (PSMA) approached the Ministry of Commerce on April 30, 2015 and May 26, 2015, and argued that with 20 per cent regulatory duty, the import of sugar by industrial sector is viable. PSMA had requested to fix the Import Trade Price (ITP) of imported sugar at \$600 or increase the customs duty on sugar from 20 to 50 per cent together with antidumping duty to save the farmers.

85. On the request of PSMA the Ministry of Commerce reacted that the fixation of ITP of sugar at \$600 per ton was against commitments under the WTO framework which prohibit imposition of minimum import price. Commerce ministry suggested that if the objective of imposition of the Regulatory Duty of 20pc is still encouraging imports of sugar into the country it could be enhanced to 50pc. It was informed that Pakistan's bound tariff under WTO for sugar is 150pc. Therefore, an increase of to 50% is permissible maintainable under the rules.

86. Pakistani sugar importers have cancelled contracts of more than 600MT of Indian sugar after increase in regulatory duty from 20 per cent to 50 per cent by the Economic Coordination Committee (ECC) of the Cabinet.

87. Intention of the Government was to ensure price stabilization with increased regulatory duty. The PSMA conveyed to sugar mill owners that if prices of commodity should be increased under the grab of current decision, the government will again slash regulatory duty. The PSMS communicated to its members that price of sugar should not be increased during Ramazan to avoid any action from government. Sugar industry was of the view that if sugar cane price was fixed at Rs 180 per 40kg, the price of sugar should be around Rs 60-65 per kg.

## **21. MARKETING OF SUGARCANE 2014-15 CROP**

88. As a perishable commodity sugarcane cannot be stored after harvesting and is to be processed either into gur at the farms or crushed by sugarmills for sugar manufacture. Its marketing plays an important role in this respect. To update information, API conducted an extensive field survey during February, 2015 in the provinces of Punjab and Sindh on the issues relating to the production and marketing of sugarcane 2004-15 crop. The survey teams interviewed cane growers, sugar mills management and crop experts. The meeting of API Committee on Sugarcane, held on February, 24, 2015 also discussed matters relating to cane marketing. In the following paragraphs, salient observations of the field survey and the meeting of the API's Committee on sugarcane are summarized.

○ **Price/Supply of Sugarcane**

89. The supply of sugarcane to the sugar mills in the Punjab and Sindh was observed satisfactory during 2014-15 was crushing season. No shortage of cane supply to any sugarmill in the survey area was reported. As price of sugarcane is concerned, the growers received Rs 180 per 40 kgs in the Punjab and Rs 182 per 40 kgs in Sindh at the mill gate. However, farmers were not satisfied with the intervention price fixed by the Provincial governments of the Punjab and Sindh. They demanded that since prices of all inputs are increasing due to 17 per cent GST imposed by the Federal Government, price for the next sugarcane crop should be high. In Sindh, it was reported that certain mills paid Rs 155 per 40 kgs and farmers had delayed supply of cane. Certain segments of farmer community had approached provincial authorities for reviving the price at Rs182 per 40 kgs.

○ **Under-weighment**

90. The under-weighment and undue deductions on the part of mills and their agents at purchase centers have been reported. The private purchase centers and the mills agents reportedly have no good repute in this respect. The weighbridges and scales installed at the purchase centers do not record the correct weighment. Mostly the farmers bringing cane remained unaware about the readings of these scales. The quantity of under weighed various from place to place and for each mill area. In order to check the under-weighment at weighbridges, the supervisory committees should be more effective. Moreover the use of private, temporary weighbridges may be banned and district governments should install their own weighbridges in the producing areas at reasonable distances.

○ **Undue deductions**

91. The sugar mills normally follow a practice of deductions on the plea that poor quality cane with high trash contents is being supplied by the farmers. At some places these deductions go upto 10 per cent. For improving the situation, the growers should be educated for properly cleaning the trash before supply to mills and the Cane Commissioners should check against such big undue deductions.

○ **Delayed payments**

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

○ **Presence of middlemen**

93. The importance of middlemen in sugarcane marketing cannot be denied as it facilitates the marketing transactions between buyers and sellers. But in case the middlemen delay the

supply of cane to mills, it harms the sugar manufacturing process by making reductions in the sugar recovery. Therefore, in such cases the role of middlemen need to be eliminated by putting restrictions on their involvement through the use of administration/legal laws.

○ **The Purchase of CPRs**

94. Since growers are in need of immediate payments for their sale proceeds, in order to avoid the delayed payments they are compelled to sell their CPRs at discount rates. This causes loss to the farming sector. It is therefore stressed that this practice of selling CPRs at discount rates may be controlled. In order to improve the situation the mills may be obligated to make payments for sale proceeds at the earliest, so that need for selling CPRs may be minimized.

○ **Use of sugarcane cess fund**

95. The sugarcane cess fund is to be utilized for the construction and improvement of roads in the sugar mills areas. It can also be utilized for research and development of sugarcane crop. Reportedly, huge amounts of sugarcane Cess Fund are lying unutilized with the Provincial Governments, due to lack of proper planning and decision. It is, therefore, recommended that the unutilized amounts may be used for the improvement of roads and for research purpose.

○ **Amendments in Sugar Factories Control Act**

96. Presently many changes have occurred in the cane marketing system and the functioning of Sugar Factories Control Act, 1950 has become less effective. Keeping in view the current needs, it is essential that the Act may be amended accordingly.

## **22. MEASURES FOR IMPROVING PRODUCTIVITY**

97. The prime concern of cane growers and the sugar industry is to achieve higher sugarcane productivity and high sugar recovery both of which support maximum economic return. In view of high water requirement of sugarcane and increasing water shortages, horizontal expansion of this crop is neither feasible nor desirable. However, to maintain the regular supply of raw material (sugarcane) to second largest agro-based sugar industry of Pakistan productivity enhancement is the only way forward. Therefore, API recommends the following measures.

### **22.1 Varietals Development**

98. The Government should pursue the PSMA and provincial Agricultural Research Institutes to emphasize for evolving drought resistant and high recovery varieties. To meet the expenditure on varietal development, Provincial Governments should take strict measures to implement the ECC decision regarding the release and utilization of "Cess Fund".

## 22.2 Improved Cultural practices

99. Provincial Departments of Agriculture Extension should take the following steps in this regard:

- Cost effective and zone specific crop production technologies might be developed and disseminated through coordinated efforts.
- With the optimal use of fertilizer and water, the crop becomes tender and attracts pests and diseases. To have effective control, Chemicals and bio-control agents for the management of pests and diseases should be used.
- Modernizing technology for improving productivity and competitiveness in the sugar cane industry provision of agricultural machinery and tools for diverse ecologies and varied farm sizes, may be looked into.
- To conserve water, there is a need for improving in efficiency and productivity of irrigation water
- Each fertilizer element plays its role in the development and production of a normal cane crop. Soil fertility and productivity significantly affect cane production, so for its optimal utilization soil analysis should be popularized.
- Encourage use for healthy seed of improved varieties of sugarcane and discourage cultivation of un-approved varieties.
- No of plants in the field play a vital role in yield and seed of fresh crop (6 – 8 months old) gives better results, this should be encouraged. Apprise the farmers for achieving the desirable plant population per acre
- The selection of an appropriate planting method and schedule greatly influences crop growth, maturity, and yield recommended Practice 'row to row' distance in sugarcane fields for effective weed control and less water requirement be popularized.
- Healthy seed gives better result in production of crop, to avoid disease and ensure healthy crop, motivate farmers for 'Hot Water Treatment' of sugarcane sets for disease control.
- For production of cost effective crop and to maintain desired level of organic matter in the soil, use of press mud to improve soil fertility be popularized in addition to use different fertilizers in recommended dosage.
- Apprise the growers about use of weedicides needs to be promoted for increasing quantity and quality of the crop .Good land preparation is a key factor in controlling weeds.

### **22.3 Biological Control**

100. The government should emphasize PSMA and Provincial Agriculture Departments to establish IPM labs for rearing predators for disease control in sugarcane crop. Awareness campaign to educate sugarcane growers about the benefits of IPM techniques.

### **22.4 Role of Sugar Industry in Cane Development**

101. To promote sugarcane crop, the sugar industry of Pakistan should:
- Take concrete measures to multiply and disseminate high sucrose varieties along with necessary extension work for development of sugarcane crop.
  - Take immediate steps to increase supply of improved varieties of cane seed among the farmers in addition to government efforts in this regard.
  - Supply press mud free of cost or on subsidize rates to sugarcane growers to ensure adequate amounts of organic matter in the soil to sustain necessary fertility level to improve yield of the sugarcane crop

## **23. COMMERCIAL VARIETIES AND THEIR YIELD POTENTIAL IN THE PUNJAB, SINDH AND KPK**

102. Cane varieties play a pivotal role in improving yield and recovery of sugar cane. The yield of cane is important for economic up lift of growers and the sugar recovery of variety is the single most dominant factor that affects the economic viability of sugar industry. Improved and high yielding varieties are one of the major sources through which cane and sugar yield per unit area cane be increased. Varieties should be cultivated according to the prescribed zones.

103. The yield potential of sugarcane varieties in the Punjab range between 80 and 130 tons per hectare. The highest yield potential of HSF-240, HSF-242 and CPF-243, varieties is estimated at 130,108 and 102 tons per hectare and highest sugar recovery percentage are 12.7, 12.5 and 12.4 of the varieties CP-77-400, CPF-243, CPF-237, HSF-240, CPF-247. If these varieties are adopted for vast cultivation in their specified areas with their recommended production technology and timely supply of inputs and application, the yield per hectare would definitely improve at the country level. List of the varieties have been presented in the (Annex-XIX).

104. Yield of High yielding cane varieties evolved by Research Institutes in Sindh range between 170 and 200 tons per hectare and highest recovery varieties is Thatta-10 and LRK-2001 on the top with 11 per cent sugar recovery. The highest yield potential of Ghulabi-95 is estimated at 200 tons per hectare and in KPK high yielding variety is CP-77-400 estimated at 100 tons per hectare with 12.7 per cent sugar recovery.

## 24 ACKNOWLEDGEMENT

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**PROVINCE-WISE AREA , PRODUCTION AND YIELD OF SUGARCANE  
IN PAKISTAN : 2004-05 TO 2014-15**

YEAR	PUNJAB	SINDH	KPK	BALUCHISTAN	PAKISTAN
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AREA ----- 000 acres -----

2004-05	1593.1	531.0	262.9	1.1	2388.2
2005-06	1545.0	452.7	243.7	1.1	2242.4
2006-07	1758.9	530.5	251.6	1.2	2542.3
2007-08	2044.1	763.1	259.0	1.2	3067.4
2008-09	1647.0	652.1	242.7	1.9	2543.7
2009-10	1500.9	578.0	249.1	1.7	2329.8
2010-11	1661.1	559.7	218.4	1.5	2440.7
2011-12	1881.0	468.8	261.7	1.7	2613.2
2012-13	1897.1	626.9	263.7	1.6	2789.3
2013-14	1870.1	735.4	290.1	1.7	2897.3
2014-15	1756.0	782.6	278.0	1.6	2818.2

YIELD ----- Tonnes per acre -----

2004-05	20.74	17.62	18.32	20.72	19.78
2005-06	18.75	24.84	18.22	13.04	19.92
2006-07	21.34	23.62	18.46	20.48	21.53
2007-08	19.72	24.63	18.50	22.74	20.84
2008-09	19.61	20.40	18.17	19.92	19.67
2009-10	20.87	23.37	18.10	20.58	21.19
2010-11	22.56	24.60	18.45	20.77	22.66
2011-12	22.80	23.01	17.90	18.15	22.35
2012-13	22.66	25.47	18.09	19.61	22.86
2013-14	23.37	24.97	18.48	19.45	23.28
2014-15	23.39	21.23	18.37	19.38	22.29

PRODUCTION ----- 000 Tonnes -----

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	37481.0	13766.4	4030.3	30.8	55308.5
2011-12	42893.0	10788.3	4684.3	31.4	58397.0
2012-13	42982.0	15966.2	4770.2	31.5	63749.9
2013-14	43704.0	18362.5	5361.4	32.2	67460.1
2014-15	41074.0	16613.8	5107.0	31.6	62826.4

**Sources:**

- 1- For 2004-05 to 2012-13 : Agricultural Statistics of Pakistan 2012-13, MINFA, Islamabad.
- 2- For 2013-14: Final estimates provided by concerned Provincial Agriculture Departments.
- 3- For 2014-15: Final estimates provided by concerned Provincial Agriculture Departments

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**PROVINCE-WISE AREA, PRODUCTION AND YIELD OF SUGARCANE  
IN PAKISTAN : 2004-05 TO 2014-15**

YEAR	PUNJAB	SINDH	KPK	BALOCHISTAN	PAKISTAN
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AREA	----- 000 hectares -----				
2004-05	644.7	214.9	106.4	0.44	966.4
2005-06	625.2	183.2	98.6	0.45	907.5
2006-07	711.8	214.7	101.8	0.50	1028.8
2007-08	827.2	308.8	104.8	0.50	1241.3
2008-09	666.5	263.9	98.2	0.77	1029.4
2009-10	607.4	233.9	100.8	0.70	942.8
2010-11	672.2	226.5	88.4	0.60	987.7
2011-12	761.2	189.7	105.9	0.70	1057.5
2012-13	767.7	253.7	106.7	0.65	1128.8
2013-14	756.8	297.6	117.4	0.67	1172.5
2014-15	710.6	316.7	112.5	0.66	1140.5

YIELD	----- Tonnes per hectare -----				
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	55.76	60.78	45.59	51.33	56.00
2011-12	56.35	56.87	44.23	44.86	55.22
2012-13	55.99	62.93	44.71	48.46	56.48
2013-14	57.75	61.70	45.67	48.06	57.54
2014-15	57.80	52.46	45.40	47.88	55.09

PRODUCTION	----- 000 Tonnes -----				
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	37481.0	13766.4	4030.3	30.8	55308.5
2011-12	42893.0	10788.3	4684.3	31.4	58397.0
2012-13	42982.0	15966.2	4770.2	31.5	63749.9
2013-14	43704.0	18362.5	5361.4	32.2	67460.1
2014-15	41074.0	16613.8	5107.0	31.6	62826.4

- Sources:**
- 1- For 2004-05 to 2012-13 : Agricultural Statistics of Pakistan 2012-13, MINFA, Islamabad.
  - 2- For 2013-14: Final estimates provided by concerned Provincial Agriculture Departments.
  - 3- For 2014-15: Final estimates provided by concerned Provincial Agriculture Departments



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**DISTRICT- WISE AREA, YIELD AND PRODUCTION OF SUGARCANE**  
**AVERAGE OF 2012-13 TO 2014-15**

ANNEX-III

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
<b>PUNJAB</b>						<b>KHYBER PAKHTUNKHWA</b>					
1	R.Y.Khan	124.51	9272.17	14.34	74.47	1	Charsadda	32.41	1440.56	2.23	44.45
2	Faisalabad	105.22	5572.34	8.62	52.96	2	Mardan	30.56	1421.83	2.20	46.53
3	Sargodha	66.23	3321.89	5.14	50.15	3	D.I.Khan	22.05	991.76	1.53	44.98
4	Jhang	51.12	2872.54	4.44	56.19	4	Peshawar	11.22	574.18	0.89	51.20
5	Muzaffargarh	45.73	2643.95	4.09	57.82	5	Nowshera	4.91	250.44	0.39	51.02
6	T.T.Singh	40.06	2309.52	3.57	57.65	6	Malakand	4.73	180.73	0.28	38.18
7	Chinot	43.71	2297.08	3.55	52.56	7	Swabi	3.44	134.63	0.21	39.16
8	Kasur	38.04	1865.16	2.88	49.03	8	Bannu	0.84	32.92	0.05	39.33
9	Rajapur	23.34	1644.15	2.54	70.45	9	Khyber AG.	0.66	15.35	0.02	23.17
10	M.B.Din	29.27	1375.70	2.13	46.99	10	Mohmand AG.	0.32	8.82	0.01	27.24
11	Bahawalpur	19.83	1232.09	1.90	62.12	11	Tank	0.25	5.34	0.01	21.66
12	Bhakkar	20.63	1074.56	1.66	52.08	12	Lakki Marwat	0.13	4.53	0.01	38.14
13	Vehar	16.86	1004.83	1.55	59.59	13	Kohat	0.12	4.32	0.01	34.82
14	Nankana Sahib	19.56	935.34	1.45	47.82	14	Harpur	0.11	3.32	0.01	31.49
15	Bahawalnagar	15.52	911.02	1.41	57.24	15	Bunri	0.11	2.90	0.00	27.20
16	Layyah	13.89	749.65	1.16	53.96	16	Dir Lower	0.10	2.45	0.00	24.52
17	Guzran	14.03	677.17	1.05	48.28	17	F.R.D.I.Khan	0.10	2.22	0.00	22.70
18	Khanewal	7.55	417.23	0.65	55.24	18	N.Waziristan	0.03	1.19	0.00	42.00
19	Khushab	8.10	376.34	0.58	46.48	19	F.R.Peshawar	0.02	0.55	0.00	29.57
20	D.G.Khan	6.61	374.50	0.58	56.69	20	Hangu	0.02	0.44	0.00	28.34
21	Sahiwal	6.88	328.72	0.51	47.80	21	Mansehra	0.01	0.33	0.00	23.05
22	Hafizabad	5.53	254.89	0.39	46.09	22	F.R.Bannu	0.08	0.31	0.00	4.03
23	Multan	3.51	174.78	0.27	49.79	23	Karak	0.00	0.03	0.00	21.00
24	Pakpattan	3.10	157.55	0.24	50.77						
25	Mianwali	2.83	156.34	0.24	55.18						
26	Sheikhupura	2.97	149.82	0.23	50.50						
27	Lodhran	2.02	114.31	0.18	56.50						
28	Gujrat	2.29	101.67	0.16	44.33						
29	Gujranwala	1.75	77.76	0.12	44.35						
30	Narowal	1.62	60.11	0.09	37.11						
31	Sialkot	1.48	48.65	0.08	32.80						
32	Lahore	0.40	19.25	0.03	48.12						
33	Jhelum	0.40	15.64	0.02	39.10						
	<b>Sub Total</b>	<b>745.01</b>	<b>42586.59</b>	<b>65.84</b>	<b>57.16</b>	<b>Sub Total</b>	<b>112.20</b>	<b>5079.55</b>	<b>7.85</b>	<b>45.27</b>	
<b>SINDH</b>						<b>BALUCHISTAN</b>					
1	Sadin	40.20	2255.43	3.49	56.11	1	S'bi	0.61	29.01	0.04	47.90
2	Thatta	37.74	2143.29	3.31	56.78	2	Lastbela	0.05	2.82	0.00	54.52
3	Nawabshah	35.54	2102.29	3.25	59.15						
4	Tando Muhammad	26.00	1568.99	2.43	60.36						
5	Ghotki	22.47	1250.52	1.93	55.66						
6	N.Feroze	20.87	1228.13	1.90	58.85						
7	Mirpurkhas	19.63	1227.16	1.90	62.52						
8	Tando Allahyar	19.88	1172.72	1.81	58.99						
9	Khalpur	19.28	1112.46	1.72	57.71						
10	Sanghar	14.02	907.69	1.40	64.76						
11	Matiari	12.92	844.28	1.31	65.36						
12	Hyderabad	6.57	388.12	0.60	59.09						
13	Sukkur	5.32	300.22	0.46	56.43						
14	Dadu	4.44	238.16	0.37	53.61						
15	Umerkot	1.81	108.16	0.17	59.64						
16	Tharparkar	0.96	48.01	0.07	50.05						
17	Jamshoro	0.76	38.47	0.06	50.69						
18	Larkana	0.46	23.41	0.04	50.74						
19	Shikarpur	0.19	9.19	0.01	47.95						
20	Shadadkot	0.17	8.76	0.01	50.17						
21	Jacobabad	0.08	3.77	0.01	45.20						
22	Kashmore	0.03	1.61	0.00	52.46						
	<b>Sub Total</b>	<b>289.33</b>	<b>18980.86</b>	<b>26.25</b>	<b>58.89</b>	<b>Sub Total</b>	<b>0.66</b>	<b>31.83</b>	<b>0.05</b>	<b>48.42</b>	
						<b>Pak Total</b>	<b>1147.20</b>	<b>64678.92</b>	<b>100.00</b>	<b>56.38</b>	

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

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

## AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN THE PUNJAB: 2014-15 AND 2015-16 CROPS

Sr. No.	Operations / Inputs	Avg No. of oprs/units/acre	2014 - 15 Crop		2015 - 16 Crop		Change in 2015-16 over 2014-15
			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	1500.00	714.00	1500.00	714.00	X- 0.00
1.2	Rotavator	0.152	1600.00	243.20	1600.00	243.20	X- 0.00
1.3	Ploughing	7.847	700.00	5492.90	700.00	5492.90	X- 0.00
1.4	Planking	3.309	350.00	1158.15	350.00	1158.15	X- 0.00
1.5	Levelling	0.561	750.00	420.75	750.00	420.75	X- 0.00
2	Seed bed preparation:						
2.1	Ploughing/Furrow making	0.487	700.00	163.45	700.00	163.45	X- 0.00
2.2	Planking	0.193	350.00	33.78	350.00	33.78	X- 0.00
2.3	Trench/Ridge making						
2.3.1	Manual (m.days)	0.106	350.00	18.55	350.00	18.55	X- 0.00
2.3.2	Tractor	0.7	700.00	245.00	700.00	245.00	X- 0.00
2.4	Bund making						
2.4.1	Manual (m.days)	1.655	350.00	289.63	350.00	289.63	X- 0.00
2.4.2	Tractor	0.158	700.00	55.30	700.00	55.30	X- 0.00
3	Seed and Sowing operations:						
3.1	40 kg units	6.578	190.00	624.91	190.00	624.91	X- 0.00
3.2	Marlas	10.64	950.00	5054.00	950.00	5054.00	X- 0.00
3.3	Harvesting, stripping and making of set (m.days)	4.796	350.00	839.30	350.00	839.30	X- 0.00
3.4	Transport	-	-	400.00	-	400.00	X- 0.00
3.5	Sowing of sets (m.days)	0.781	350.00	136.68	350.00	136.68	X- 0.00
3.6	Contract sowing	-	-	400.00	-	400.00	X- 0.00
4	Interculture and Earthing up:						
4.1	Manual/binding of plants	0.609	1400.00	852.60	1400.00	852.60	X- 0.00
4.2	Bullock/tractor	2.008	700.00	1405.60	700.00	1405.60	X- 0.00
5	Plant Protection:						
5.1	Weedicides	0.124	600.00	74.40	650.00	80.60	X- 6.20
5.2	Granules	0.120	550.00	66.00	600.00	72.00	X- 6.00
5.3	Sparys	0.305	625.00	190.63	700.00	213.50	X- 22.88
6	Irrigation:						
6.1	Canal	8.9	-	250.00	-	250.00	X- 0.00
6.2	Private tubewell	4.44	1300.00	5772.00	1300.00	5772.00	X- 0.00
6.3	Mixed	2.16	300.00	648.00	300.00	648.00	X- 0.00
6.4	Labour for irrigation and water course cleaning (m.days)	4.86	350.00	1701.00	350.00	1701.00	X- 0.00
7	Farm Yard Manure:						
7.1	Material	-	-	1200.00	-	1500.00	X- 300.00
7.2	Transport & application	-	-	1100.00	-	1100.00	X- 0.00
8	Fertilizers: (bags)						
8.1	DAP	1.28	3587.00	4591.36	3700.00	4736.00	X- 144.64
8.2	Urea	1.73	1824.00	3155.52	1875.00	3243.75	X- 88.23
8.3	Nitrophos	0.35	2462.00	861.70	2555.00	894.25	X- 32.55
8.4	SSP	0.01	967.00	9.67	992.00	9.92	X- 0.25
8.5	CAN	0.01	1547.00	15.47	1609.00	16.09	X- 0.62
8.6	SOP	0.07	4367.00	305.69	4900.00	343.00	X- 37.31
8.7	Gypsum	0.44	200.00	88.00	200.00	88.00	X- 0.00
8.8	Fert. transport and application	3.89	80.00	311.20	80.00	311.20	X- 0.00
9	Mark up @ 15.0 % per annum for 13 months on items 1 to 8 minus item 6.1	-	-	6278.74	-	6382.53	X- 103.78
10	Land rent for 13 months	-	23000.00	24916.67	24000.00	26000.00	X- 1083.33
11	Average weighted land tax @ Rs 132/acre/annum for 13 months	-	-	143.00	-	143.00	X- 0.00
12	Management charges for 13 months	-	-	2235.00	-	2362.00	X- 127.00
13	Harvesting & stripping (40 kg units)	565.15	13.00	7273.48	13.00	7273.48	X- 0.00
14	Expected escalation in cost of selected items	-	-	3578.00	-	2609.00	X- 969.00
15	Total cost (Items 1 to 14)	-	-	83313.33	-	84297.03	X- 983.70
16	Yield (40 kg units)	-	-	565.15	-	565.15	X- 0.00
17	Cost of production at farm level: (Rs/40 kgs)						
17.1	Including land rent	-	-	147.42	-	149.16	1.74
17.2	Excluding land rent	-	-	103.33	-	103.15	-0.18
18	Marketing expenses: (Rs/40 kgs)						
18.1	Transport, etc.	-	-	14.00	-	14.00	0.00
18.2	Development cess	-	-	1.00	-	1.00	0.00
19	Cost of production at mill-gate: (Rs/40 kgs)						
19.1	Including land rent	-	-	162.42	-	163.16	0.74
19.2	Excluding land rent	-	-	118.33	-	118.15	-0.18

## AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN SINDH: 2014-15 AND 2015-16 CROPS

Sr. No.	Operations / inputs	Avg No. of oprs/units/acre	2014 - 15 Crop		2015 - 16 Crop		Change in 2015-16 over 2014-15
			Cost per unit	Cost per acre	Cost per unit	Cost per acre	
1	2	3	4	5=3*4	6	7=3*6	8=7-5
Rupees							
1	Land preparation :						
1.1	Deep ploughing	0.523	1600.00	836.80	1600.00	836.80	0.00
1.2	Ploughing	5.606	1100.00	6166.60	1100.00	6166.60	0.00
1.3	Planking	1.577	550.00	867.35	550.00	867.35	0.00
1.4	Levelling	0.872	1100.00	1069.20	1100.00	1069.20	0.00
2	Seed bed preparation:						
2.1	Ploughing/Furrow making	1.136	1100.00	862.22	1100.00	862.22	0.00
2.2	Planking	1.34	550.00	508.53	550.00	508.53	0.00
2.3	Trench/ridge making						
2.3.1	Manual (m.days)	0.074	350.00	17.87	350.00	17.87	0.00
2.3.2	Tractor (hrs)	0.174	1100.00	132.07	1100.00	132.07	0.00
2.4	Bund making (m.days)						
2.4.1	Manual (m.days)	0.403	350.00	97.32	350.00	97.32	0.00
2.4.2	Tractor (hrs)	0.812	1100.00	616.31	1100.00	616.31	0.00
3	Seed and Sowing operations:						
3.1	40 kg units	64.118	190.00	8405.87	190.00	8405.87	0.00
3.2	Ghuntas	0.665	5000.00	2363.25	5000.00	2363.25	0.00
3.3	Harvesting, stripping and making of set (m.days)	4.42	350.00	1067.43	350.00	1067.43	0.00
3.4	Transportation	-	-	700.00	-	700.00	0.00
3.5	Sowing of sets (m.days)	0.588	350.00	142.00	350.00	142.00	0.00
3.6	Contract sowing	-	-	700.00	-	700.00	0.00
4	Interculture and Earthing up:						
4.1	Manual	1.762	1500.00	2643.00	1500.00	2643.00	0.00
4.2	Bullock/tractor	1.725	1100.00	1897.50	1100.00	1897.50	0.00
5	Plant Protection :						
5.1	Weedicides	0.300	600.00	180.00	650.00	195.00	15.00
5.2	Granules	0.245	500.00	122.50	550.00	134.75	12.25
5.3	Sprays	0.265	550.00	145.75	600.00	159.00	13.25
6	Irrigation						
6.1	Canal	20.88	-	181.87	-	181.87	0.00
6.2	Private tubewell	2.45	750.00	1837.50	750.00	1837.50	0.00
6.3	Labour for Irrigation and water course cleaning (m.days)	5.859	350.00	2050.65	350.00	2050.65	0.00
7	Farm Yard Manure:						
7.1	Material	-	-	1800.00	-	2000.00	200.00
7.2	Transport & application	-	-	1000.00	-	1000.00	0.00
8	Fertilizers: (bags)						
8.1	DAP	1.512	3467.00	5242.10	3650.00	5518.80	276.70
8.2	Urea	3.625	1805.00	6543.13	1856.00	6735.25	192.13
8.3	Nitrophos	0.376	2385.00	898.78	2563.00	963.69	66.93
8.4	CAN	0.239	1533.00	366.39	1593.00	380.73	14.34
8.5	SOP	0.085	4367.00	371.20	4800.00	416.50	45.31
8.6	Fert. transport and application	5.828	80.00	466.32	80.00	466.32	0.00
9	Mark up @ 15.0 % per annum for 16 months on item 1 to 8 minus Item 6.1	-	-	10023.12	-	10190.30	167.18
10	Land rent for 16 months	-	18000.00	24000.00	18000.00	25333.33	1333.33
11	Land tax @ Rs 200/acre/annum for 16 months	-	-	267.00	-	267.00	0.00
12	Drainage cess	-	-	24.00	-	24.00	0.00
13	Management charges for 16 months	-	-	2589.00	-	2807.00	318.00
14	Harvesting & stripping (40 kg units)	676.02	13.00	8788.26	13.00	8788.26	0.00
15	Expected escalation in cost of selected items	-	-	3552.00	-	2668.00	-884.00
16	Cost of production at farm level: (Rs/40 kgs)	-	-	99540.87	-	101313.28	1772.41
17	Cost of production at farm level: (Rs/40 kgs)	-	-	9788.87	-	9788.87	0.00
18	Cost of production at farm level: (Rs/40 kgs)						
18.1	Including land rent	-	-	147.25	-	149.86	2.62
18.2	Excluding land rent	-	-	111.74	-	112.39	0.65
19	Marketing expenses: (Rs/40 kgs)						
19.1	Transport, etc.	-	-	14.00	-	14.00	0.00
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	-	-	128.06	-	128.71	0.65
20.2	Excluding land rent	-	-	128.06	-	128.71	0.65

## AVERAGE FARMERS' COST OF PRODUCTION OF SUGARCANE IN KPK: 2014-15 AND 2015-16 CROPS

Sr. No.	Operations / Inputs	Avg No. of oprs/units/acre	2014 - 15 Crop		2015 - 16 Crop		Change in 2015-16 over 2014-15
			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
			-37-		Rupees		
1	Land preparation:						
1.1	Deep ploughing/Rotavator	0.665	2000.00	1330.00	2000.00	1330.00	0.00
1.2	Ploughing	2.776	1000.00	2776.00	1000.00	2776.00	0.00
1.3	Planking	0.435	500.00	217.50	500.00	217.50	0.00
1.4	Levelling	0.344	1000.00	344.00	1000.00	344.00	0.00
2	Seed bed preparation:						
2.1	Ploughing/Furrow making	0.982	1000.00	510.64	1000.00	510.64	0.00
2.2	Planking	0.027	500.00	7.02	500.00	7.02	0.00
2.3	Trech/Ridge making (tractor hrs)	0.039	1000.00	20.28	1000.00	20.28	0.00
2.4	Bund making (m.days)	1.274	350.00	231.87	350.00	231.87	0.00
3	Seed and Sowing operations:						
3.1	40 kg units	76.337	220.00	8732.95	220.00	8732.95	0.00
3.2	Harvesting, stripping and making of set (m.days)	3.671	350.00	668.12	350.00	668.12	0.00
3.3	Transport	-	-	700.00	-	700.00	0.00
3.4	Sowing of sets (m.days)	4.097	350.00	745.65	350.00	745.65	0.00
4	Interculture and Earthing up:						
4.1	Manual/binding of plants	1.642	1800.00	2955.60	1800.00	2955.60	0.00
4.2	Bullock/tractor	1.859	1000.00	1859.00	1000.00	1859.00	0.00
5	Plant Protection:						
5.1	Weedicides	0.360	700.00	252.00	750.00	270.00	18.00
5.2	Granules	0.240	575.00	138.00	625.00	150.00	12.00
5.3	Sprays	0.275	650.00	178.75	700.00	192.50	13.75
6	Irrigation:						
6.1	Canal	15.19	-	863.00	-	863.00	0.00
6.2	Private tubewell	2.61	700.00	1827.00	700.00	1827.00	0.00
6.3	Private canal (manual labour)	2.43	100.00	243.00	100.00	243.00	0.00
6.4	Labour for irrigation and water course cleaning (m.days)	7.953	350.00	2783.55	350.00	2783.55	0.00
7	Farm Yard Manure:						
7.1	Material	-	-	1800.00	-	1900.00	100.00
7.2	Transport & application	-	-	1500.00	-	1500.00	0.00
8	Fertilizers: (bags)						
8.1	DAP	0.83	3625.00	3008.75	3700.00	3071.00	62.25
8.2	Urea	1.97	1808.00	3561.76	1880.00	3703.60	141.84
8.3	Nitrophos	0.33	2450.00	808.50	2600.00	858.00	49.50
8.4	CAN	0.13	1547.00	201.11	1600.00	208.00	6.89
8.5	Fert. transport and application	3.26	80.00	260.80	80.00	260.80	0.00
9	Mark up @ 15.0 % per annum for 15 months months on item 1 to 8 minus item 6.1	-	-	7061.60	-	7137.39	75.79
10	Land rent for 15 months	-	28000.00	35000.00	29000.00	36250.00	1250.00
11	Average weighted land tax @ Rs 75/acre/annum for 15 months	-	-	94.00	-	94.00	0.00
12	Management charges for 15 months	-	-	2578.00	-	2725.00	147.00
13	Harvesting & stripping (40 kg units)	585.46	13.00	1750.53	13.00	1750.53	0.00
14	Expected escalation in cost of selected items	-	-	2748.00	-	2748.00	0.00
15	Total cost (Items 1 to 14)	-	-	87756.98	-	89634.00	1877.02
16	Yield (40 kg units)	-	-	585.46	-	585.46	0.00
17	Cost of production at farm level: (Rs/40 kgs)						
17.1	Including land rent	-	-	149.89	-	153.10	3.21
17.2	Excluding land rent	-	-	90.11	-	91.18	1.07
18	Marketing expenses: (Rs/40.kgs)						
18.1	Transport, etc.	-	-	14.00	-	14.00	0.00
18.2	Development cess	-	-	0.54	-	0.54	0.00
19	Cost of production at mill-gate: (Rs/40 kgs)						
19.1	Including land rent	-	-	104.65	-	105.72	1.07
19.2	Excluding land rent	-	-	104.65	-	105.72	1.07

ECONOMICS OF SUGARCANE AND COMPETING CROPS AT  
PRICES REALIZED BY THE GROWERS: 2014-15 CROPS

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	Crop day	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	74550	23533	93250	69717	18700	1.25	3.96	237	1943
2	Seed cotton	240	22	55529	18683	57240	38557	1711	1.03	3.06	239	2602
3	Basmati paddy	180	58	46676	20973	40828	19855	-5848	0.87	1.95	227	704
4	IRRI paddy	180	62	41128	17999	33039	15040	-8089	0.80	1.84	184	533
5	Wheat	180	12	39490	14438	41510	27072	2020	1.05	2.88	231	3459
6	Sunflower (spring)	180	22	40792	16768	40400	23633	-392	0.99	2.41	224	1836
7	Seed cotton + wheat	420	34	95019	33122	98750	65628	3731	1.04	2.98	235	2904
8	Seed cotton+sunflower	420	44	96321	35451	97640	62189	1319	1.01	2.75	232	2219
9	Basmati paddy+wheat	360	70	86166	35411	82338	46927	-3828	0.96	2.33	229	1176
10	Basmati paddy+sunflower	360	80	87467	37740	81228	43487	-6240	0.93	2.15	226	1015
11	IRRI paddy + wheat	360	74	80618	32437	74549	42112	-6069	0.92	2.30	207	1007
12	IRRI paddy+sunflower	360	84	81920	34767	73439	38672	-8481	0.90	2.11	204	874

## Sindh

1	Sugarcane	488	71	88853	29138	113355	84217	24502	1.28	3.89	232	1597
2	Seed cotton	240	18	51752	16155	59978	43823	8226	1.16	3.71	250	3332
3	IRRI paddy	180	56	38008	13613	44780	31168	6772	1.18	3.29	249	800
4	Wheat	180	12	37525	13253	40173	26920	2648	1.07	3.03	223	3348
5	Sunflower (spring)	180	22	41316	16318	40400	24083	-916	0.98	2.48	224	1836
6	Seed cotton + wheat	420	30	89277	29408	100151	70743	10874	1.12	3.41	238	3338
7	Seed cotton+sunflower	420	40	93068	29408	100378	70970	7310	1.08	3.41	239	2509
8	IRRI paddy+ wheat	360	68	75533	26866	84953	58087	9420	1.12	3.16	236	1249
9	IRRI paddy+sunflower	360	78	79324	29930	85180	55250	5856	1.07	2.85	237	1092

## Notes for Annex - VII

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2014-15 crops.
2. The data regarding input-output parameters have been adopted from the API's price policy papers for sugarcane, seed cotton, rice paddy and wheat, 2014-15 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 2014-15 crops. To incorporate the escalations in input prices, which occurred during the growing period of 2014-15 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 2014-15 season.
3. Water use has been estimated from the number of irrigations as reported in the cost of production estimates of the respective crops assuming each irrigation of 3 inches and 'rauni' of 4 inches.
4. The following prices as realized by the growers for different crops are adopted for the analysis:
  - 4.1 The support price of Rs 1300 per 40 kgs, as maintained by the government for 2014-15 crop, has been adopted for the current analysis.
  - 4.2 The wholesale market prices of basmati paddy and IRRI paddy during the post-harvest period in major producer area markets have averaged at Rs 1330 and Rs 801 per 40 kgs, respectively. While, the average price of IRRI paddy in Sindh is reported at Rs 844 per 40 kgs.
  - 4.3 The wholesale market prices of seed cotton during the post-harvest months of Aug - Feb 2014-15 in the main producer area markets have averaged at Rs 3000 per 40 kgs in the Punjab and Sindh.
  - 4.4 The price of sunflower 2014-15 crop has been reported hovering around Rs 2050/40 kgs and Rs 2100 for canola.
  - 4.5 The market prices of sugarcane at mill-gate in the major cane producing areas are reported to hover around Rs 180 per 40 kgs in the Punjab and Rs 182 per 40 kgs 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 15 per 40 kgs in Punjab and Rs 14.32 in Sindh

for sugarcane, Rs 40 for seed cotton in Punjab and Sindh, Rs 45 for rice paddy in Punjab and Rs 40 in Sindh, and Rs 30 for wheat and oilseeds.

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

ECONOMIC EFFICIENCY OF RESOURCE USE IN  
IN SUGARCANE PRODUCTION IN PUNJAB  
(Based on import parity prices)

Description	Revenue	Traded Inputs Cost	Domestic Factor Cost	Profit
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----- Rupees per acre -----

**2010-11**

Private Prices	98901	22711	31412	44778
Social Prices	126062	20274	28870	76919
Transfers	-27161	2438	2542	-32141

**2011-12**

Private Prices	83642	29497	42730	11415
Social Prices	93148	26330	39877	26941
Transfers	-9506	3167	2853	-15525

**2012-13**

Private Prices	96076	32892	44094	19089
Social Prices	79353	29365	41044	8944
Transfers	16723	3528	3050	10145

**2013-14**

Private Prices	96076	33384	45775	16916
Social Prices	75351	29713	42670	2968
Transfers	20724	3671	3105	13948

**2014-15**

Private Prices	93250	32818	50495	9936
Social Prices	65964	28813	46532	-9381
Transfers	27285	4005	3963	19317



ECONOMIC EFFICIENCY OF RESOURCE USE  
IN SUGARCANE PRODUCTION IN SINDH  
(Based on import parity prices)

Description	Revenue	Traded Cost	Domestic Factors' Cost	Profits
----- Rupees per acre -----				
<b>2010-11</b>				
Private Prices	133510	27804	37399	68307
Social Prices	169386	25296	32903	111187
Transfers	-35875	2509	4497	-42881
<b>2011-12</b>				
Private Prices	112554	36467	47891	28197
Social Prices	120362	33033	42718	44611
Transfers	-7808	3434	5172	-16414
<b>2012-13</b>				
Private Prices	126412	40905	49602	35905
Social Prices	104131	36926	44109	23097
Transfers	22281	3979	5493	12808
<b>2013-14</b>				
Private Prices	123032	41579	51892	29561
Social Prices	102577	35738	45986	20852
Transfers	20456	5841	5906	8709
<b>2014-15</b>				
Private Prices	121680	41447	58469	21764
Social Prices	91450	35005	51335	5110
Transfers	30231	6442	7135	16654

ECONOMIC EFFICIENCY OF RESOURCE USE  
IN SUGARCANE PRODUCTION IN PUNJAB  
(Based on export parity prices)

Description.	Revenue	Traded Inputs Cost	Domestic Factor Cost	Profit
----- Rupees per acre -----				
<b>2010-11</b>				
Private Prices	98901	22711	31412	44778
Social Prices	104332	20274	28870	55189
Transfers	-5431	2438	2542	-10411
<b>2011-12</b>				
Private Prices	83642	29497	42730	11415
Social Prices	76866	26330	39877	10659
Transfers	6776	3167	2853	757
<b>2012-13</b>				
Private Prices	96076	32892	44094	19089
Social Prices	62941	29365	41044	-7468
Transfers	33135	3528	3050	26557
<b>2013-14</b>				
Private Prices	96076	33384	45775	16916
Social Prices	54322	29713	42670	-18061
Transfers	41753	3671	3105	34977
<b>2014-15</b>				
Private Prices	93250	32818	50495	9936
Social Prices	45393	28813	46532	-29952
Transfers	47857	4005	3963	39889

ECONOMIC EFFICIENCY OF RESOURCE USE  
IN SUGARCANE PRODUCTION IN SINDH  
(Based on export parity prices)

Description	Revenue	Traded Cost	Domestic Factor Cost	Profits
-------------	---------	----------------	----------------------------	---------

----- Rupees per acre -----

**2010-11**

Private Prices	133510	27804	37399	68307
Social Prices	141663	25296	32903	83465
Transfers	-8153	2509	4497	-15158

**2011-12**

Private Prices	112554	36467	47891	28197
Social Prices	100805	33033	42718	25054
Transfers	11749	3434	5172	3143

**2012-13**

Private Prices	126412	40905	49602	35905
Social Prices	84419	36926	46810	683
Transfers	41993	3979	2792	35222

**2013-14**

Private Prices	123032	41579	51892	29561
Social Prices	76767	35738	45986	-4957
Transfers	46265	5841	5906	34518

**2014-15**

Private Prices	121680	41447	58469	21764
Social Prices	65944	35005	50040	-19100
Transfers	55736	6442	8430	40864

**DOMESTIC AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR  
DOMESTIC MARKETS: 2014 AND 2015**

Month	Lahore	Fasilabad	Karachi	Hyderabad	Peshawar	Average
<b>2014</b>						
	----- Rupees per 100 kgs -----					
January	4847	4845	4800	5200	4950	<b>4928</b>
February	4810	4844	4750	5260	5000	<b>4933</b>
March	5042	5070	4800	5375	5300	<b>5117</b>
April	5070	5038	5000	5420	5200	<b>5146</b>
May	4976	5008	4900	5420	5200	<b>5076</b>
June	5219	5199	5000	5090	5300	<b>5127</b>
July	5365	5278	5100	5090	5650	<b>5208</b>
August	5536	5465	5300	5020	5800	<b>5330</b>
September	5762	5761	5800	6350	5850	<b>5918</b>
October	5671	5595	5500	5500	5800	<b>5567</b>
November	5431	5406	5200	5500	5750	<b>5384</b>
December	5280	5270	5100	5450	5300	<b>5275</b>
<b>Average</b>	<b>5251</b>	<b>5232</b>	<b>5104</b>	<b>5390</b>	<b>5158</b>	<b>5251</b>
<b>2015</b>						
January	5095	5136	5000	5150	5400	<b>5156</b>
February	5209	5179	5000	5200	5400	<b>5198</b>
March	5225	5191	5000	5143	5250	<b>5162</b>
April	5520	5482	5200	5368	5400	<b>5394</b>
May	5806	5718	5400	5500	5800	<b>5606</b>
June	5931	5836	5800	5800	5975	<b>5868</b>
<b>Average</b>	<b>5464</b>	<b>5424</b>	<b>5233</b>	<b>5360</b>	<b>5538</b>	<b>5434</b>

- Sources:
1. Agriculture Marketing Information Services, Punjab, Lahore.
  2. Agriculture Marketing Services, Sindh, Huderabad.
  3. Agriculture Marketing Services, Peshawar, KPK.

**AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR DOMESTIC MARKETS:  
2000-01 TO 2014-15 ( 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	6848	6706	6687	6895	6993	6826	10.58
2011-12	5326	5256	5055	5374	5350	5272	-22.75
2012-13	5117	5084	4977	4947	4772	4979	-5.56
2013-14	4942	4949	5050	5314	5113	5074	1.89
2014-15 (Oct-Jun)	5463	5424	5244	5401	5564	5419	6.81

Sources: 1. Agriculture Marketing Information Services, Punjab, Lahore.  
2. Agriculture Marketing Services, Sindh, Hyderabad.  
3. Agriculture Marketing Services, Peshawar, KPK.

AVERAGE INTERNATIONAL PRICES OF SUGAR: 2001-02 to 2014-15 (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
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	4.86	107.23	17.66
2010-11	26.56	585.45	32.29	711.93	5.74	126.49	17.77
2011-12	22.68	499.96	27.54	607.20	4.86	107.23	17.66
2012-13	18.12	399.56	23.96	528.15	5.83	128.58	24.35
2013-14	17.42	384.02	20.96	461.99	3.54	77.97	16.88
2014-15	14.59	321.75	17.64	388.80	3.04	67.06	17.25
October	16.77	369.71	19.46	428.92	2.69	59.21	13.80
November	16.19	356.92	19.08	420.63	2.89	63.71	15.15
December	15.33	337.96	18.05	397.93	2.72	59.96	15.07
January	15.34	338.18	18.04	397.71	2.70	59.52	14.97
February	15.59	343.69	17.43	384.26	1.84	40.56	10.56
March	13.16	290.12	16.55	364.86	3.39	74.74	20.48
April	13.08	288.36	16.66	367.28	3.58	78.92	21.49
May	13.42	295.85	17.36	382.70	3.94	86.85	22.69
June	12.47	274.91	16.10	354.95	3.63	80.04	22.55

Source: International Sugar Organization (ISO), London.

PER CAPITA AVAILABILITY (CONSUMPTION OF SUGAR: 2011-12 TO 2013-14  
(October - September))

S. No	Items	2011-12	2012-13	2013-14
		-----Thousands tonnes-----		
1	Opopening stocks as on 1st October	1109	1394	844
2	Production	4670	5063	5615
3	Imports	7	34	8
4	Export	145	1027	375
5	Closing stocks as on 30th September	1394	844	1197
6	Net availability (item 1+2+3-4-5)	4247	4620	4895
		-----Million-----		
7	Population	187.58	191.31	194.53
		-----Kgs per annum-----		
8	Per capita availability ( consumption)	22.64	24.15	25.16
9	Average per capita availability Average (2011-12 to 2013-14)		23.98	

Note:

a) Population of AJ& K, NAS and Afghanrefuges have also been included.

Sources:

- |                                       |  |
|---------------------------------------|--|
| 1. For stocks and production:         | Pakistan Sugar Mills Association, Islamabad.   |
| 2. For import and export:             | Federal Bureau of Statistics, Karachi.   |
| 3. For population of Pakistan:        | Economic Survey, 2014-15.  |
| 4. For population of AJ&K and Nas:    | Population Census Organization, Islamabad.   |
| 5. For population of Afghan refugees: | Kasmir Affairs and Northern Areas and States and Frontier Regions Division, Government of Pakistan, Islamabad. |

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

## PRICE OF WHITE SUGAR

S.No	Item	June 2015		2014- 15 (Oct-June)		2011-12 to 2013-14	
		US \$ per tonne					
1.	Average fob (London) price	354.95		388.80		532.45	
2.	Freight charges upto Karachi	60		60		60	
3.	C & f cost at Karachi port	415		449		592	
4.	Exchange rate (Rs/\$)	101.8		101.8		101.8	
		Rs per tonne					
5.	C & f cost at Karachi port (Pak rupees)	42242		45688		60311	
6.	Marine insurance @ 0.23 % of c & f cost	97		105		139	
7.	Cif cost at Karachi port	42339		45793		60450	
8.	Landing charges @1% of Cif Value	423		458		605	
9.	L.C opening charges @0.04% of C&f Value	17		18		24	
10.	Bank services charges @0.1% of C&F value	42		46		60	
11.	Provision of shortage & unforeseen losses @0.25% of C&F	106		114		151	
12.	Stevedoring charges	725		725		725	
13.	Clearing & forwarded charges	8		8		8	
14.	Misc: Exp 0.05% of of C&F value	21		23		30	
15.	Wharfage & Weightment	54		54		54	
16.	Importer's profit 2% of C&F value	845		914		1206	
17.	Transport charges for up country	2500		2500		2500	
18.	Incidental charges incurred on imported sugar	4741		4860		5363	
19.	Ex-mill/ market cost of imported sugar	47080		50653		65813	
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
20.	Processing cost of sugar (a)	16007	16007	17222	17222	22376	22376
21.	Value of cane to produce one of sugar (item 19-item 20)	31073	31073	33431	33431	43437	43437
22.	Provincial base sugar recovery (Percent)	9.85	10.21	9.85	10.21	9.85	10.21
23.	Quantity of cane in tonnes required to produce one tonne of sugar ((100/ item 22)	9.79	10.50	9.79	10.50	9.79	10.50
24.	Price of one tonne of sugarcane (item 21/item 23)	3173.94	2959.32	3414.78	3183.88	4436.85	4136.83
25.	Price of 40 kgs of cane	126.96	118.37	136.59	127.36	177.47	165.47

## Sources:

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

## Note

- (a) Ratio of cost of cane to processing cost has been estimated at 66:34 from publication " Cost of Production of Sugar " jointly prepared in 1996 by APCoM and Business & Consultancy Services.



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ANNEX-XVII

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

S.No	Item	June 2015	2014-15 (Oct-June)		During 2011-12 to 2013-14		
		US \$ per tonne					
1.	Average fob (London) price	354.95	388.60		532.45		
2.	Exchange rate (Rs/\$)	101.8	101.8		101.8		
3.	Average fob Karachi price (assuming equivalent to fob London price)	35134	39580		54203		
4.	Transport charges from interior Sindh to port, special packing, inspection transit insurance, loading and unloading, clearing and forwarding and port terminal charges	2000	2000		2000		
5.	Bank commission @ 1.25 % of fob price	452	495		578		
6.	Inspection charges	429	429		429		
7.	Ex-mill price of sugar (item 3 minus items 4 through 6)	33253	36656		51097		
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
8.	Processing cost of sugar (a)	11306	11306	12463	12463	17373	17373
9.	Value of cane to produce one of sugar (item 7-item 8)	21947	21947	24193	24193	33724	33724
10.	Provincial base sugar recovery (Percent)	9.85	10.21	9.85	10.21	9.85	10.21
11.	Quantity of cane in tonnes required to produce one tonne of sugar ((100/ item 10)	9.79	10.50	9.79	10.50	9.79	10.50
12.	Price of one tonne of sugarcane (item 9/ item 11)	2241.79	2090.20	2471.20	2304.10	3444.73	3211.80
13.	Price of 40 kgs of cane	89.67	83.61	98.85	92.16	137.79	128.47

## Notes:

- 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 Agency, Karachi.

## Note

- (a) Ratio of cost of cane to processing cost has been estimated at 68:34 from publication "Cost of Production of Sugar" jointly prepared in 1998 by APCOM and Business & Consultancy Services.

**MIL-GATE PRICES OF SUGARCANE WORKED BACK FROM THE EXPECTED WHOLESALE MARKET PRICES  
OF SUGAR DURING 2014-15**

S.No	Item	WORKED BACK PRICES OF SUGARCANE					
		Rupees per tonne					
1.	Average wholesale market prices of sugar (a)	55000	60000	65000			
2.	Wholesale dealer margin @5% on net price	2434	2655	2876			
3.	Federal excise duty @ 8%	3894	4248	4602			
4.	Net price of sugar (items 1-2-3)	48673	53097	57522			
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
5.	Processing cost of sugar (a)	16549	16549	18053	18053	19558	19558
6.	Value of cane to produce one tonne of sugar (item 4-item 5)	32124	32124	35044	35044	37965	37965
7.	Provincial base sugar recovery (Percent)	9.85	10.21	9.85	10.21	9.85	10.21
8.	Quantity of cane in tonnes required to produce one tonne of sugar ((100/ item 7)	9.79	10.50	9.79	10.50	9.79	10.50
9.	Price of one tonne of sugarcane (item 6/item 8)	3281	3059	3580	3338	3878	3616
10.	Price of 40 kgs of cane	131.25	122.38	143.18	133.50	155.12	144.63

**Note**

- (a) Ratio of cost of cane to processing cost has been estimated at 66:34 from publication "Cost of Production of Sugar" jointly prepared in 1996 by APCOM and Business & Consultancy Services, Islamabad

**Sources:**

- For prices: Annex-VIII.  
For FED: FBR, Islamabad.

**Commercial Sugarcane Varieties Developed and Released through  
Coordinated Sugar Crops Research Program of the PARC**

S. No.	Name of variety	Name of Institute	Year of Release	Maturity	Cane Yield (t/ha)	Sugar recovery (%)
<b>Punjab</b>						
1.	BF-162	AARI, Fsd.	1990	Early	100	10.5
2.	SPSG-26	SRI, Jhang	1991	Early	100	10.2
3.	BF-129	AARI, Fsd.	1996	Mid	100	9.8
4.	CP-43-33	AARI, Fsd.	1996	Early	90	10.8
5.	CP-72-2086	AARI, Fsd.	1996	Early	90	12.0
6.	CP-77-400	AARI, Fsd.	1996	Early	100	12.7
7.	CPF-237	AARI, Fsd.	2000	Early	95	12.5
8.	SPF-213	AARI, Fsd.	2000	Mid	100	11.0
9.	HSF-240	AARI, Fsd.	2002	Early	130	12.5
10.	SPF-234	AARI, Fsd.	2002	Early	100	11.6
11.	SPF-245	AARI, Fsd.	2004	Early	100	11.0
12.	HSF-242	AARI, Fsd.	2006	Early	108	12.4
13.	CPF-243	AARI, Fsd.	2006	Early	102	12.7
14.	NSG-555	SRI, Jhang	2008	Mid	119	10.1
15.	NSG-311	SRI, Jhang	2008	Mid		
16.	CPF-246	AARI, Fsd	2010	Early	105	12.0
17.	CPF-247	AARI, Fsd	2010	Early	105	12.5
<b>Sindh</b>						
18	Ghulabi-95	ARI, Tandojam	1996	Early	200	10.7
19	NIA-98	NIA, Tandojam	1998	Mid	180	10.5
20	Thatta-10	NSCRI, Thatta	2004	Early	180	11.0
21	NIA-2004	NIA, Tandojam	2004	Mid	170	9.5
22	LRK-2001	QAARI, Larkan	2005	Early	200	11.0
<b>KPK</b>						
22.	CPM-13	SCRI, Mardan	1989	Early	70	12.5
23.	CO-1321	SCRI, Mardan	1989	Early	70	12.0
24.	Mardan -92	SCRI, Mardan	1992	Mid	100	12.0
25.	Mardan -93	SCRI, Mardan	1993	Early	100	12.5
26.	CP-77-400	SCRI, Mardan	1996	Mid	80	12.7
27.	Jn-88/1	SBS, Dargai	1996	Early	70	12.7
28.	Abid-96	SBS, Dargai	1996	Early	70	12.5
29.	SN-98	SCRI, Mardan	1998	Early	72	12.2
30.	MCP-421	SCRI, Mardan	2003	Mid	80	12.5
31.	Mardan-2005	SCRI, Mardan	2005	Early	90	12.2
32.	KB-2010	ARS, Bannu	2010	Early		

Source: PARC.

