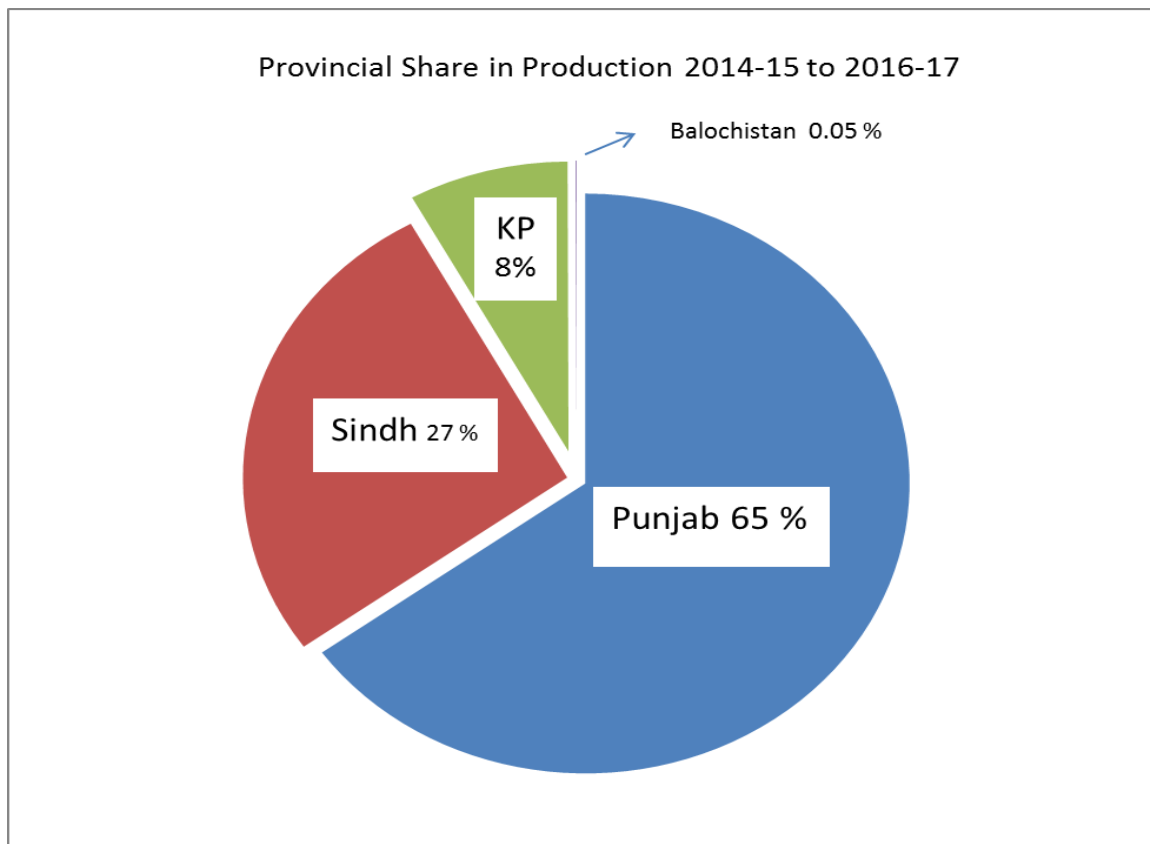




SUGARCANE POLICY ANALYSIS FOR 2017-18 CROP



AGRICULTURE POLICY INSTITUTE
MINISTRY OF NATIONAL FOOD SECURITY AND RESEARCH
GOVERNMENT OF PAKISTAN
ISLAMABAD

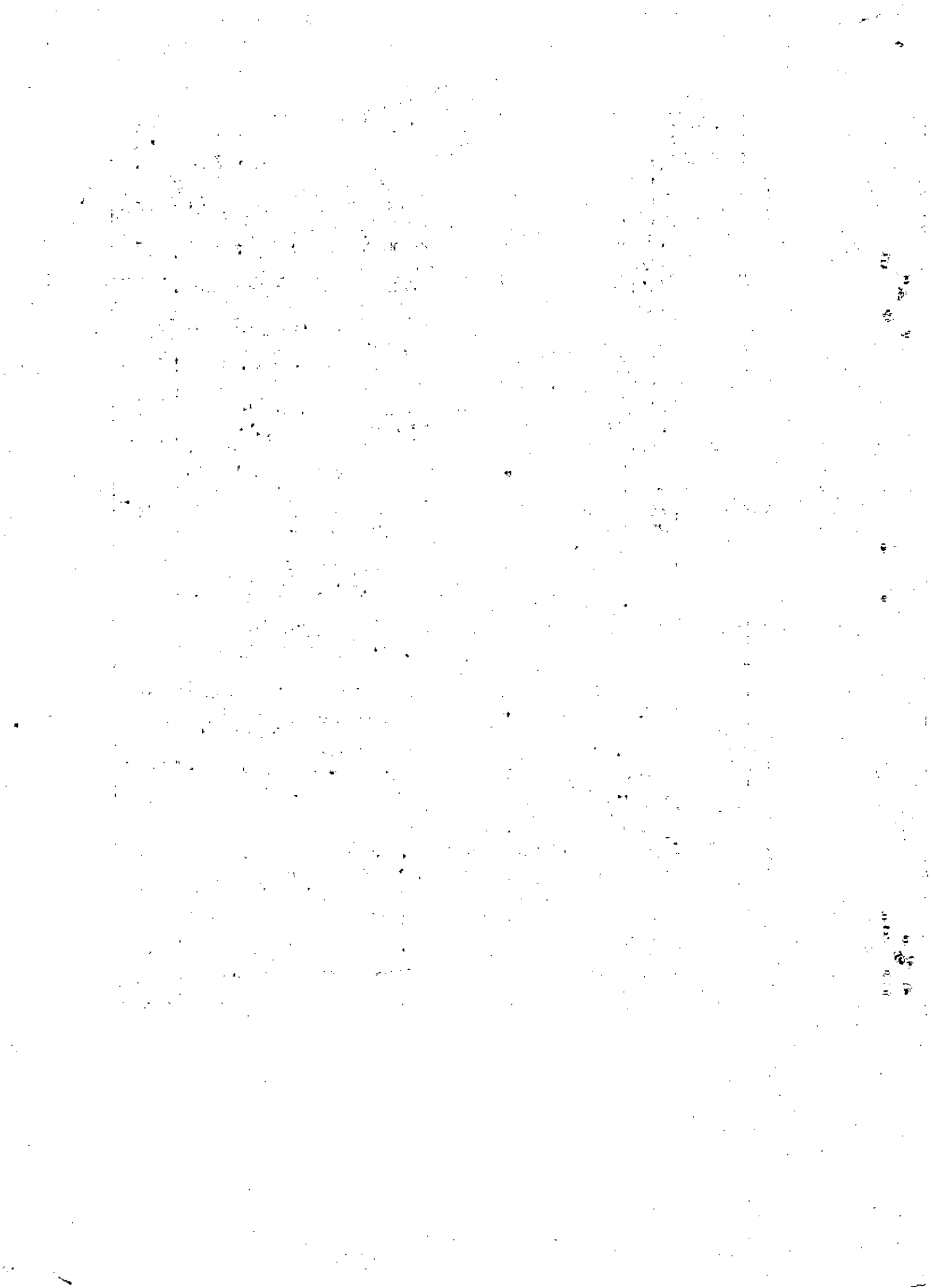
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SUGARCANE POLICY ANALYSIS 2017-18 CROP

EXECUTIVE SUMMARY AND RECOMENDATION

- **Price of Sugarcane for 2017-18 crop**

Sugarcane is the second most important cash crop of Pakistan, provides raw material to the second largest agro-based industry comprising 80 sugar mills to ethanol production and cheap boards industry. The sugar mills also generate electricity and to supply to WAPDA during winter by using the waste material of sugarcane.

2. There are 82 working condition sugar mills in the country with an annual sugar production capacity of 7.5 million tonnes. Capacity utilization is 85-95%. The sugar-crushing season spans from October to March. For 2016-17 crop, the government has fixed the sugarcane price at mill gate @ Rs 180 for Punjab and Rs 182 per 40 kgs for Sindh. However, this price policy was not implemented at the announced price of Rs 172/40 kgs.

- **Likely Price Policy Options**

3. API conducted rigorous analysis for determining Indicative Price for Sugarcane 2017-18 Crop. Results of the analysis are given below:-

Important Determinants of indicative Price Based on	Sugarcane Price at Mill-gate (Rs per 40 kgs)	
	Punjab	Sindh
1. Cost of production of sugarcane	169.22	171.96
2. Sugarcane Price Derived from average wholesale prices of sugar:		
a) Rs 55,000 per ton	125.54	130.55
b) Rs 60,000 per ton	136.95	142.42
c) Rs 65,000 per ton	148.37	154.29
3. Price received by cane growers for 2016-17 crop	180	182
4. Import Parity based on average fob London price of white sugar at US \$ 371.92/ton (Sept 2017)	129.55	134.72
5. Export Parity based on: average fob London price of white sugar at US \$ 371.92/ton (Sept 2017)	94.19	97.95

- **Improving Marketing of Sugarcane**

4. Sugarcane is one of the main cash crops of Pakistan. Due to perishable nature, it has to be processed either into gur/khandsari at the farms or crushed by sugar mills for sugar manufacture. The following problems are being faced by the growers, especially in the years of good harvest.

- **Underweighment**

5. The weighbridges and scales installed at the purchase centers or at mill gate should monitor by the committee consist of district management, mill representative and growers representative.

- **Undue deductions**

6. The sugar mills are making deductions on the plea that poor quality cane with high trash contents is being supplied by the farmers. The growers should be educated for properly cleaning the trash before supply to mills, and the Provincial Cane Commissioners should check against such high undue deductions.

- **Delayed payments**

7. The payments to farmers are generally made within two weeks but as the season progresses to the end, the payments are delayed by months and in some cases by season. There is a need to impose penalties on such late payments.

- **Presence of middlemen**

8. The role of middleman in sugarcane marketing is increasing. In the current scenario, the importance of middleman cannot be denied as it facilitates the marketing transactions between buyers and sellers. The role of middlemen needs to be eliminated by putting restrictions on their involvement through the use of administrative and/ or legal instruments or instruments regularized through rules and regulation.

- **Use of sugarcane cess fund**

9. The sugarcane cess fund should be utilized for research and development of sugarcane crop. Huge amounts of sugarcane cess fund are lying unutilized with the district/provincial governments. It is suggested that suitable portion of amounts of sugarcane cess fund may be used for the improvement of education and health purpose for sugarcane growers.

- **Value-addition and vertical integration in sugar industry**

10. In view of the fluctuating trend in the world prices of sugar and large-scale investments in the domestic sugar industry it is imperative to improve the efficiency of resource use in sugarcane production and its processing. In the wake of fast approaching globalization and WTO requirements the sugar industry of Pakistan which relies on sugar manufacturing only and has not paid much attention to the production of other value added products, would also have to go into value adding business.

- **Improving Productivity**

11. Sugarcane, a high water delta crop, poses serious competition to other important crops: cotton, rice, wheat, etc. Thus, sugarcane area already spanning over one million hectares, given the recurring water shortages and the increasing demand for water from other crops it is of utmost importance to increase the productivity of resource use in agriculture through all the possible means. On the basis of available evidence, there exists a vast scope for the improvement in yield of cane and its sucrose contents through improved crop management as well as its processing.

- **Low plant population**

12. Lack of adequate plant population remains an important factor in low productivity of sugarcane. The use of sugarcane planter may be used for proper and effective sowing of sugarcane.

- **Balanced use of fertilizers**

13. Chemical fertilizers play an important role in enhancing crop productivity but real key for getting maximum returns from the investment on fertilizers is their balanced and timely application. The provincial governments should launch campaigns to educate the growers about the importance of the use of balanced doses of various fertilizers based on proper plant/soil analysis and the timings and methods of use of various fertilizers.

- **Use of press mud/organic matter**

14. Press mud is a waste and by product of sugar industry containing 2 per cent of N, 4 per cent of $P_2 O_5$ and 1 per cent of $K_2 O$. Presently. The press mud is normally used as fuel in brick kilns which the provincial governments need to discourage and promoting its use as organic matter/manure in crop production.

- **Control of diseases**

15. Sugarcane is attacked by a number of diseases. These diseases greatly influence cane yields and sucrose recovery. The Integrated Pest Management (IPM) technology based on the use of cultural methods and biological measures to control sugarcane pests and diseases is better solution as compared to chemical control. Therefore, sugar mills, also being the direct beneficiaries of increased production and improved quality of the produce, need to spearhead the cause of IPM. The Provincial agriculture departments should launch an educational campaign for the growers and the sugar mills on the subject.

Recommendation

16. In view of the problems faced by the growers as well as the sugar industry, the current policy of fixing the cane price by the provincial government needs to be reconsidered. The price of sugarcane as in case of other crops, should be determined by the Federal Government.

17. In view of the relevant factor analyzed in para-3 of this report, The Ministry of National Food Security and Research may recommend the sugarcane price with the consultation of Provincial Governments.

18. 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 Commerce should do extraordinary efforts to promote sugar export. They must help the sugar exporters in exploring new markets for export of sugar.

SUGARCANE POLICY ANALYSIS FOR **2017-18 CROP**

1. INTRODUCTION

Sugarcane is the second most important cash crop of Pakistan, provides raw material to the second largest agro-based industry comprising 80 sugar mills and further provides raw materials to ethanol production and cheap boards industry. The sugar mills also provide electricity to WAPDA during winter by using the waste material of sugarcane.

2. It is also a major source of livestock fodder during winter and provides seasonal employment to millions of rural farming and non-farming population. Sugarcane farming and sugar industry have significantly contributes to rural development.

3. Sugarcane is a tropical crop cultivated mainly in the districts of Jhang, Faisalabad, Sargodha, Kasur, and T.T Singh of Punjab; Hyderabad, Badin and Thatta of Sindh; and Charsadda and Mardan of NWFP.

4. During 2016-17, the production of sugarcane portrayed a very promising picture and reached to historical high of 73.6 million tonnes showing an increase of 12.4 percent over the production of 65.5 million tonnes during 2015 16 and comfortably exceeded the target of 67.5 million tonnes by a considerable margin of 9.0 percent. Its production accounted for 3.4 percent in agriculture's value addition and 0.7 percent in overall GDP. The area cultivated for sugarcane crop reached 1217 thousand hectares compared to last year's area of 1131 thousand hectares showing an increase of 7.6 percent.

5. In view of the importance of the sugarcane and sugar for the economy, the indicative price of sugarcane are annually reviewed by the Agriculture Policy Institute (API), Ministry of National Food Security and Research and provided to provinces for fixation and implementation of price. For the formulation of policy proposals for 2017-18 sugarcane crops, the following steps were taken by the API.

- i) To update the cost of inputs and cultural operations a field survey was conducted in the important sugarcane regions of Punjab and Sindh. During the course of survey detailed discussion were also held with the growers, crop experts and mill management on issues relating to production and marketing of sugarcane.
- ii) Annual meeting of API' Standing Committee on sugarcane was held. The meeting attended by researchers, progressive growers, representative of farmers associations, sugar industry and senior officers of provincial agriculture extension departments. The participants discussed at length issues concerning with cultivation and marketing of sugarcane, current crises of sugar industry and future prospectus. The views expressed in the meeting have been dully considered in formulating proposal contained in this report.
- iii) The data on area, yield, production and prices of sugarcane; domestic as well as world production, demand, stocks, prices and trade of sugar were collected from various relevant sources and analyzed.

6. The sugar sector, at present, is characterized by a number of distortion, and inefficiencies, both in production and processing of sugarcane. There is also a gulf between the growers and sugar industry in perception of problems and prospect of the sector. It is imperative not only to remove the inefficiencies affecting the sector but also to abridge the gulf between industry and farmers. All the stake holders must base their relationship on mutual trust and appreciation of each other's problems for sustained production of sugarcane and sugar. The mill can promote production of sugarcane through research and development efforts and technical guidance to the farmers and the farmers at the same time must appreciate that healthy industry is in their interest as sick industry cannot play effective role in the crop development. It is in the interest of industry as well as the growers to stabilize sugarcane production in the line with not only to meet the domestic requirement simultaneously, to have a comparative advantage in sugar export.

2. SUGARCANE PLANTING AND HARVESTING SEASONS

7. 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 of sugarcane, 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 th February to 3 rd week of March	September
Sindh	1 st February to 15 th March	September to 15 th October
NWFP	15 th February to 3 rd week of March	September
	Harvesting Time	
Punjab, Sindh, KPK	15 th October to 1 st March	

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

3. PROVINCIAL SHARES

8. Provincial shares in area and production of sugarcane are discussed below:

3.1 Area and Production

9. Shares of area and production of sugarcane during the period 2006-07 to 2008-09 and 2014-15 to 2016-17 and changes therein are presented in Table-2 below:

Table-2: Comparison of Provincial Shares in Area and Production of Sugarcane: 2006-07 to 2009-10 and 2014-15 to 2016-17

Country/ Province	Area			Production		
	Average 2006-07 to 2008-09	Average 2014-15 to 2016-17	Change	Average 2006-07 to 2008-09	Average 2014-15 to 2016-17	Change
	----- Percent -----					
Pakistan	100.00	100.00	-	100.00	100.00	-
Punjab	66.84	62.87	-6.0	65.29	65.09	-0.3
Sindh	23.86	27.22	14.1	26.45	26.89	1.7
KPK	9.24	9.85	6.6	8.21	7.97	-2.9
Baluchistan	0.05	0.06	10.3	0.05	0.05	-14.0

Source: Worked out from Annex-I.

10. It is clear from Table-2 that Punjab, Sindh and KP share 62.87, 27.22 and 9.85 percent in area and 65.09, 26.89 and 7.97 percent in production. Share of Punjab has decreased 6.0 percent in area and 0.3 percent in production. Sindh, area and production have increased by 14.1 and 1.7 percent respectively. In KPK, despite of increase in area by 6.6 percent, production has decreased by 2.9 percent. Provincial shares are also depicted in Figures-1 to 4.

4. IMPORTANT SUGARCANE PRODUCING DISTRICTS

11. Sugarcane is a high delta crop. It is grown in irrigated conditions. Districts which grow 100 thousand tonnes 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, Sheikhpora and Lodhran in the Punjab; Badin, Thatta, Nawabshah, Tando Muhammad Khan, Ghotki, N.Feroze, Mirpur Khas, Tando Allahyar, Khairpur, Sanghar, Matiari, Hyderabad, Sukkur, Dadu, and Unerkot from Sindh; Charsadda, Mardan, D.I.Khan, Peshawar, Nowshera, Malakand and Swabi from KPK. These 49 districts; 27 from the Punjab, 15 from Sindh and 7 from KPK collectively account for 99 per cent of the sugarcane's area and production (Annex-II).

Fig - 1 Provincial Share in Area from 2016-07 to 2008-09

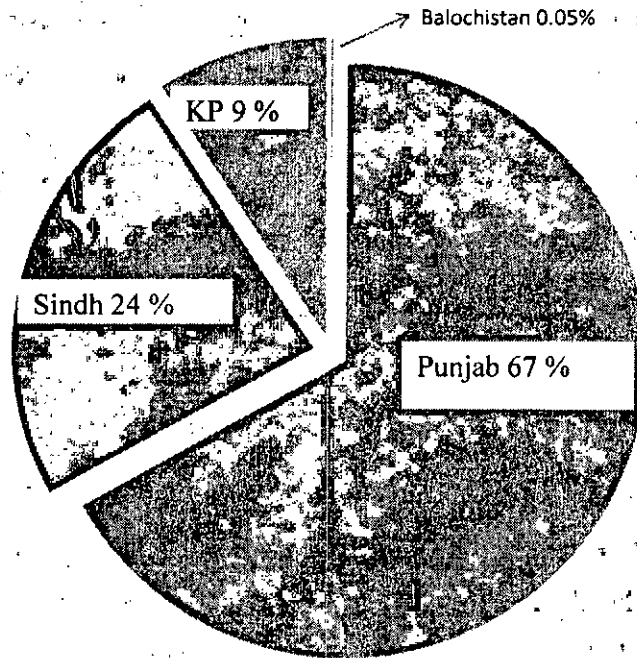


Fig - 2 Provincial Share in Area from 2014-15 to 2016-17

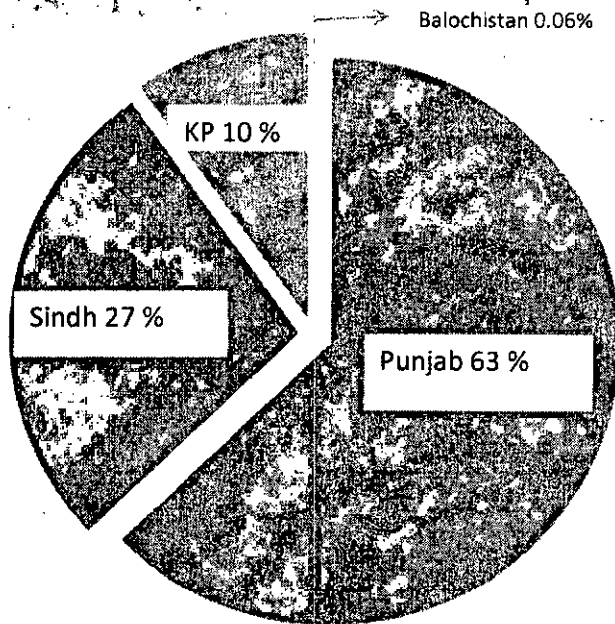
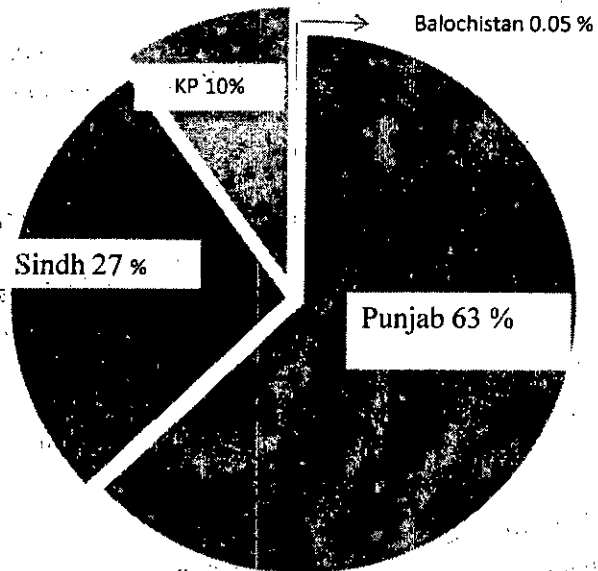
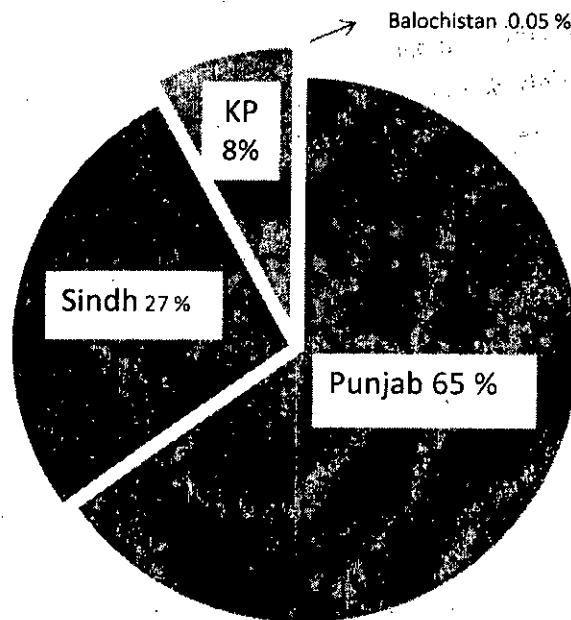


Fig - 3 Provincial Share in Production from 2006-07 to 2008-09**Fig- 4 Provincial Share in Production 2014-15 to 2016-17**

12. However, 24 districts, namely, R.Y.Khan, Faisalabad, Sargodha, Jhang, Muzaffargarh, T.T.Singh, Chiniot, Kasur, Rajanpur, M.B.Din, Bahawalpur, Bhakkar, M.B Din, Ghotki, Badin, Thatta, Nawabshah, Tando Muhammad Khan, N.Feroze, Mirpur Khas, Tando Allahyar, Khairpur, D.I Khan, Charsadda and Mardan collectively produce 79 per cent of the total sugarcane produced in the country.

5. CHANGES IN AREA, YIELD AND PRODUCTION

12. During the decade ending 2016-17 area under sugarcane at country level ranged between 942.08 to 1241.3 thousand hectares (2329.7 to 3067.4 thousand acres).

Production from 49372.9 to 75482.2 thousand tonnes and yield oscillated between 48.6 to 62.0 tonnes per hectare (Annex-II).

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

5.1 Long-term Changes: 2006-07 to 2016-17

14. During the period under discussion sugarcane production increased @ 2.9 per cent per annum mainly due to improvement in yield @ 1.7 per cent and 1.2 per cent per annum expansion in area (Table-3).

Table-3: Average Annual Growth Rate of Area, Yield and Production of Sugarcane: 2006-07 to 2016-17

Country/Province	Area	Yield	Production
	----- Percent per annum -----		
Pakistan	1.2	1.7	2.9
Punjab	0.5	2.3	2.8
Sindh	2.9	0.4	3.4
KPK	1.8	0.5	2.3
Baluchistan	2.6	-1.7	0.8

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

15. Sugarcane production in the Punjab during the period under reference has increased @ 2.8 percent per annum, as a result of 2.3 per cent improvement in yield and 0.5 per cent expansion in area. Sugarcane production in Sindh has increased significantly @ 3.4 per cent due to 2.9 and 0.4 per cent expansion in area and yield.

16. In the KPK sugarcane production is also increased @ 2.3 per cent per annum mainly due to increase in area.

5.2 Short-term Changes: 2015-16 and 2016-17 Crops

17. According to Provincial Agriculture Departments sugarcane production at country level for 2016-17 crop is reported at 75482.2 thousand tonnes reflecting an increase of 15.3 percent over last year's production of 65482.5 thousand tonnes. Increase in production is mainly due to 7.1 per cent improvement in yield and 7.6 percent expansion in area (Table-4).

Table-4: Area, Yield and Production of Sugarcane: 2015-16 and 2016-17 Crops

Country/ Province	Area		Changes	Yield		Changes	Production		Changes
	2015-16	2016-17		2015-16	2016-17		2015-16	2016-17	
	000 ha		Per cent	tonnes per ha		Per cent	000 tonnes		Per cent
Pakistan	1131.6	1217.6	7.6	57.9	62.0	7.1	65482.5	75482.2	15.3
Punjab	705.4	777.8	10.3	59.5	63.8	7.2	41968.2	49613.0	18.2
Sindh	312.8	320.5	2.5	57.5	63.1	9.7	17984.3	20208.9	12.4
KPK	112.7	118.6	5.2	48.8	47.5	-2.7	5498.3	5628.7	2.4
Balochistan	0.7	0.7	0.0	45.3	45.1	-0.3	31.7	31.6	-0.3

Source: Annex-I.

18. Sugarcane production for 2016-17 in the Punjab is reported at 49613 thousand tonnes which shows an increase of 18.2 percent over last year. The incline is mainly due to 10.3 and 3.6 percent increase in area and yield respectively.

19. Production of sugarcane during 2016-17 in Sindh is also increased by 12.4 per cent over the previous year, from 17984 to 20209 thousand tonnes. An escalation is attributed mainly due to 2.5 and 9.7 percent improvement in area and yield respectively.

20. In the KPK production has also increased by 2.4 percent due to increase by 5.2 percent in area however 2.7 percent decrease in yield.

21. Baluchistan production decreased by 0.3 percent is mainly due to decrease of 0.3 percent in yield

6. TARGETS VS ACHIEVEMENTS: 2016-17 CROP

22. The Federal Committee for Agriculture (FCA) has fixed sugarcane production target for 2016-17 crop at 67.535 million tonnes. As per final estimates of the Provincial Agriculture Departments sugarcane production is reported at 75.482 million tonnes (11.8 percent higher than the target) due to 8.2 percent expansion in area and 3.3 percent in improvement in yield (Table-5).

Table-5: Targets and Estimated Achievements of Area, Yield and Production of Sugarcane: 2016-17 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	Tonnes/ha		Per cent	-- 000 tonnes --		Per cent
Pakistan	1124.9	1217.6	8.2	60.0	62.0	3.3	67535.0	75482.2	11.8
Punjab	690.0	777.8	12.7	62.3	63.8	2.4	43000.0	49613.0	15.38
Sindh	320.0	320.5	0.2	59.4	63.1	6.23	19000.0	20208.9	6.36
KPK	114.2	118.6	3.9	48.2	47.5	-1.5	5500.0	5628.7	2.3
Baluchistan	0.7	0.7	0.0	50.0	45.1	-9.8	35.0	31.6	-9.7

Sources:

1. For targets: Targets have been fixed by respective Provincial Agriculture Departments
2. For achievements: Annex-I.

23. In the provinces of the Punjab, Sindh and KPK sugarcane production has surpassed the targets by 15.48, 6.4 and 2.3 percent while in the Balochistan, production has reduced by 9.7 percent against the target.

7. SUGARCANE YIELD AMONG COMPETING COUNTRIES

24. Global sugarcane during 2017 occupied an area of around 25,977 thousand hectares with a total production of 1,841,528 thousand tonnes. The world top 15 producing countries contribute 87.43 per cent of total area and 89.21 per cent of total production as narrated in Table-6 & 7.

Table-6: MAJOR SUGARCANE PRODUCING COUNTRIES AREA OF THE WORLD: 2017 CROP

S.No.	Country	Area (000 ha.)	Per cent share in world area
1	Brazil	10,184	39.21
2	India	4,389	16.90
3	China, mainland	1,371	5.28
4	Thailand	1,368	5.27
5	Pakistan	1,217	4.68
6	Mexico	772	2.97
7	Australia	453	1.75
8	Philippines	437	1.68
9	Indonesia	430	1.66
10	Colombia	397	1.53
11	Cuba	388	1.49
12	Argentina	379	1.46
13	United States of America	366	1.41
14	Viet Nam	281	1.08
15	Guatemala	279	1.07
	Total of 15 countries	22,711	87.43
	World Total	25,977	100.00

Source: World Statistics Year Book, 2017

25. In terms of sugarcane area Brazil is on the top with 10,184 thousand hectares followed by India with 4,389 thousand hectares and China, Thailand with 13,711,368 thousand hectares respectively. Pakistan stands at 5th position in this regard with 5 per cent share.

26. In terms of sugarcane production, Brazil is again on the top position with 759 million tonnes followed by India with 306 million tonnes and China, Thailand with 104, 103 million tonnes respectively. However, Pakistan retains 5th position in sugarcane production (Table-7).

Table-7: MAJOR SUGARCANE PRODUCING COUNTRIES PRODUCTION OF THE WORLD: 2017 CROP

S.No.	Country	Production in (000 tonnes)	Per cent Share in World Area
1	Brazil	758,548	41.19
2	India	306,069	16.62
3	China, mainland	104,404	5.67
4	Thailand	102,946	3.59
5	Pakistan	73,401	3.99
6	Mexico	56,955	1.09
7	Australia	36,561	1.99
8	Colombia	34,638	1.88
9	Guatemala	33,758	1.83
10	United States of America	30,153	1.64
11	Philippines	29,287	1.59
12	Indonesia	21,213	1.15
13	Argentina	19,165	1.04
14	Viet Nam	18,356	1.00
15	South Africa	17,388	0.94
	Total of 15 countries	1,642,844	94.10
	World Total	1,841,528	100.00

Source: World Statistics Year Book, 2016

27. In terms of yield per hectare, Peru lies at the top with 121.25 tonnes per hectare followed by Guatemala 121.01 tonnes per hectare and Senegal, Egypt with 118.01, 112.70 tonnes per hectare respectively. It is an upsetting situation that Pakistan ranks at 50th in terms of yield at 60.32 tonnes per hectare which is far below the international average while India lies at 33 positions with 69.74 tonnes per hectare. However, the world average yield of sugarcane is 70.89 tonnes per hectare Annex-IV).

8. COST OF PRODUCTON

28. Empirical estimation of the production of sugarcane is problematic because of cost of considerable variation in the use level of inputs and management practices,

resulting from the varied agro-climatic conditions and farm systems, under which the crop is raised. Both fresh and ratoon crops with different duration and husbandry practices are grown. Even the fresh crop is cultivated both in autumn and spring season resulting in varying crop duration. Beside practice of inter cropping of other crops with sugarcane makes the estimation of its cost of production complicated.

8.1 Cost of Production of Sugarcane by Province

29. The cost of production of sugarcane for the 2017-18 crop in Punjab and Sindh have been analyzed by adopting the input-output parameters as used in calculating COP estimates for the 2016-17 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 API in the major sugarcane producing areas of Punjab and Sindh during April 2016. The detailed cost estimates are presented in Annexes-V to VI while summary of the results is given in Table-8.

Table-8: Average Farmer Cost of Production of Sugarcane: 2016-17 and 2017-18 Crops

Items	Unit	Cost estimates		Increase in 2017-18 over 2016-17
		2016-17 Crop	2017-18 Crop	
Punjab				
1. Cost of cultivation	Rs/acre	81817	82103	286.27
2. Yield	40 kgs/acre	565.15	600	34.85
3. Cost of production at farm level	Rs/40 kgs	144.77	136.84	-7.93
4. Marketing cost & risk factor	"	30.98	32.38	4.53
5. Cost of production at mill-gate	"	175.75	169.22	-6.52
Sindh				
1. Cost of cultivation	Rs/acre	99206	105755	6548.36
2. Yield	Kgs/acre	676	750	74.00
3. Cost of production at farm level	Rs/40 kgs	146.75	141.01	-5.75
4. Marketing cost & risk factor	"	30.43	30.95	1.00
5. Cost of production at mill-gate	"	177.11	171.96	-5.22

Source: Annexes-V to VI.

Punjab

30. The cost of raising one acre of sugarcane in the Punjab during 2017-18 crop season is likely to be Rs 82103 including land rent table 10. Based on the average yield of 600 maunds (40 kgs) per acre, the cost of production at farm level comes to Rs 136.84 per 40 kgs. Weighing up marketing expenses and risk factor @ Rs 32.38 per 40 kgs, the cost of sugarcane at mill-gate would be Rs.169.22 per 40 kgs, lower by Rs 6.53 (5.22%) than the parallel cost estimates of 2016-17 crop.

- Sindh

31. During 2017-18 crop season, the cost of cultivation of sugarcane in Sindh works out to Rs 105755 per acre, including land rent. The farm level cost of production of sugarcane is estimated at Rs 1141.01 per 40 kgs, based on an average yield of 750 maunds per acre. According for marketing expenses including cane development cess @ Rs 15.32 per kgs, the mill-gate cost of production would be Rs 156.33 per 40 kgs, lower by Rs 4.75 (3.03 percent) than the correspondence cost of Rs 161.07/40 kgs of previous year.

8.2 Cost of Major Operations/Inputs

32. The shares of major operations and farm inputs in the total cost of cultivation of sugarcane for 2016-17 and 2017-18 crops in the Punjab and Sindh are shown in the Table-9.

- Punjab

33. Land rent is the major component of the cost of sugarcane in Punjab for 2017-18 crop, contributing 31 percent. Other major ingredients are: seed & sowing costs 10.74%, fertilizers including FYM (13.26%), land preparation (11.23%) and harvesting and stripping 10.13%.

Sindh

34. In Sindh major components of the cost of cultivation of sugarcane during 2017-18 crop are land rent (31.52%), fertilizer including FYM (10.25%), seed including sowing operation (11.72%), harvesting and stripping (11.35%) and land preparation 9.48%.

Table-9: Cost of Major Operations/Inputs of Sugarcane: 2016-17 and 2017-18 Crops

Input/operation	2016-17 crop	2017-18 crop	Increase/ Decrease
	Rs/acre		Per cent
Punjab			
1. Land Preparation	8353	9225	872
2. Seed and sowing operations	7471	8820	1349
3. Inter-culture and ear thing up	7325	5600	-1725
24. Plant protection	2258	2097	-161
5. Irrigation	366	351	-15
6. Fertilizer including FYM	12475	10891	-1584
7. Land rent	24917	26000	1083
8. Harvesting and stripping	7274	8316	1042
9. Other costs	11328	10803	-525
Total cost	81817	82103	286
Sindh			
1. Land Preparation	10673	10023	-650
2. Seed and sowing operations	13669	14756	1087
3. Inter-culture and ear thing up	4541	4541	0
4. Plant protection	518	510	-8
5. Irrigation	4240	3383	-857
6. Fertilizer including FYM	13964	13841	-123
7. Land rent	26667	33333	6666
8. Harvesting and stripping	9464	12000	2536
9. Other costs	15370	13368	-2002
Total cost	99206	105755	6549

Notes: Others include mark-up, management, land tax, drainage cess and expected escalation in the cost of selected items.

9. COMPARATIVE ECONOMICS OF SUGARCANE AND COMPETING CROPS

35. Farmers, while allocating resources among the competing enterprises, primarily consider a number of fundamental economic factors including the gross cost, gross income, gross margin, net income, output-input ratio, etc.

36. 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 2016-17 crop year. Detail of the analysis is presented for the Punjab and Sindh provinces in Annex-VII. A summary of analysis against various economic indicators is provided in Table-10 and Table-11 and results of the analysis are briefly discussed in the following paragraphs.

Table-10: Economics of Sugarcane and Competing Crops at Prices Realized by the Growers for 2016-17 crop in Punjab Province

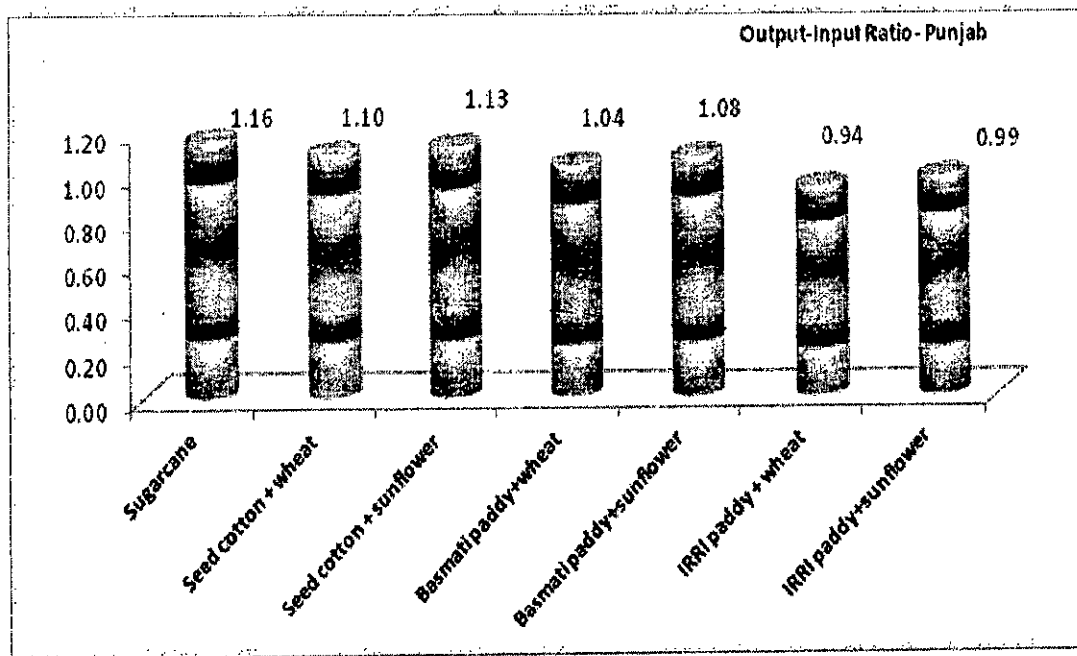
Competing crops/ combinations	Output/input ratio	Gross revenue per		
		Rupee of purchased inputs cost	Day of crop duration	Acre inch of irrigation water used
		----- Rupees -----		
1. Sugarcane	1.16	4.55	237	1943
2. Cotton + wheat	1.10	3.63	245	3030
3. Cotton + sunflower	1.13	3.36	258	2459
4. Basmati + wheat	1.04	2.86	244	1255
5. Basmati + sunflower	1.08	2.69	258	1163
6. IRRI + wheat	0.94	2.75	209	1016
7. IRRI + sunflower	0.99	2.58	223	957

Source: Annex-VII.

Punjab

37. The Table-10 above indicates that sugarcane growers' returns to overall investment remained higher for sugarcane, which performed better than the entire crop combinations. None of the combinations could compete with Sugarcane in terms of returns to purchased inputs. Similarly, Sugarcane also out-competed both Basmati and IRRI combinations in terms of irrigation water. However, cotton + wheat and cotton + sunflower rotations performed better than sugarcane in this indicator. Similarly, in terms of returns to crop duration both cotton and Basmati combinations performed better than sugarcane in Punjab.

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



Sindh

38. Sugarcane growers, in Sindh, have also been largely reported receiving the indicative price during 2016-17. However, in certain parts of the province, the price

received by the farmers was relatively less than the indicative price notified by the provincial government. Based on the indicative price, the analysis presents that Sugarcane returned better than the competing crops, in terms of output-input ratio.

39. In terms of returns to crop duration, sugarcane performed low against cotton + sunflower and IRRI combinations. Similarly, sugarcane performed better than all the crop combinations in terms of returns to purchased inputs, while its performance remained low against cotton combinations in terms of returns to irrigation water. IRRI combinations remained below the sugarcane in terms of returns to irrigation water.

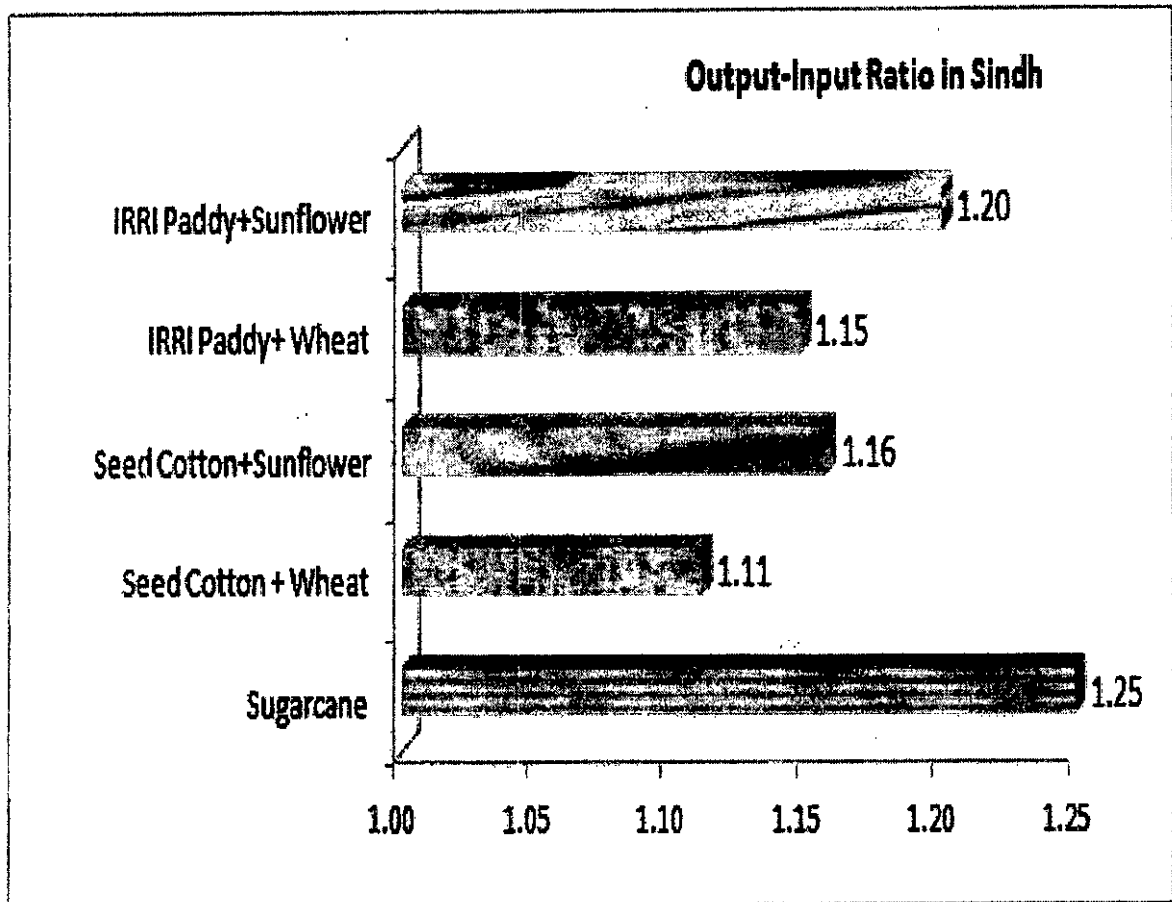
Table-11 : Economics of Sugarcane and Competing Crops at Prices Realized by the Growers for 2016-17 Crop in Sindh

Crop/ crop combination	Output-input ratio	Gross revenue per		
		Rupee of purchased inputs' cost	Day of crop duration	Acres inch of irrigation water used
		----- Rupees -----		
1. Sugarcane	1.25	4.28	232	1597
2. Cotton + wheat	1.11	3.86	231	3331
3. Cotton + sunflower	1.16	4.17	249	2618
4. IRRI + wheat	1.15	3.67	235	1245
5. IRRI + sunflower	1.20	3.54	257	1135

Source: Annex-VII.

9.1 Economics of Sugarcane: Inter Provincial Comparison

40. In view of its longer duration, sugarcane crop in the Sindh province requires more water and other inputs as compared to Punjab.

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

41. The higher yield of Sindh by 19.65 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 i.e 11.64 percent as compared to the Punjab. Similarly, irrigation water is also applied on higher side in Sindh (47.92 percent). The crop duration is longer in Sindh by 23.86 percent as compared to Punjab.

42. Chemical fertilizers are used on higher side in Sindh by 85.71 per cent in nitrogenous and by 14.71 per cent in phosphatic ingredients.

Table-12: Input Use Level and Yield of Sugarcane in Sindh Versus Punjab: 2016-17 Crop

Item	Unit	Sindh	Punjab	Difference of the Sindh province over Punjab (%)
Crop duration	Crop day	488	394	23.86
Irrigation water	Acre inch	71	48	47.92
Purchased inputs other than fertilizer	Rs./ acre	12415	11121	11.64
Fertilizer Use:				
N	Nutrients kg/acre	104	56	85.71
P	"	39	34	14.71
Crop yield	40 kg/ acre	676	565	19.65

10. NOMINAL AND REAL INDICATIVE/MARKET PRICES OF SUGARCANE

43. 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 during 2010-11 to 2016-17. Discussing below indicates the province-wise trends in nominal and real terms.

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

44. The analysis of indicative and market prices of sugarcane for the Punjab province during 2010-11 to 2016-17 is given in the Table-13.

Table-13: Nominal and Real Indicative & Market Prices of Sugarcane Realized by the Growers in the Punjab: 2010-11 to 2016-17

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	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
2015-16	180	180	202.73	88.89	88.89
2016-17	180	180	211.57	85.07	85.07

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's field survey.

Sources:

1. Price Policy Report for Sugarcane by API (various issues).
2. Pakistan Economic Survey, 2016-17.

45. The 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 and 2016-17. During this period, the Consumer Price Index (CPI), the most commonly used measure of inflation in the economy, escalated by 44.46 per cent. A consistent growth is observed in the nominal and real indicative prices of sugarcane upto 2012-13. However, the real prices subsequently declined on an irregular pattern. For the 2016-17, real indicative price of sugarcane works out to be Rs.85.07 per 40 kgs, the lowest price. The real indicative price remained lower than the nominal price since 2010-11, mainly for higher CPI during the period.

46. As far 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 during 2012-14, however increased again to Rs 180 in 2015-16 till 2016-17. However, the real market price conved also a depressing situation which remained below the nominal market price all the way through the period under review.

10.2 Nominal and Real Indicative Prices of Sugarcane in Sindh

47. The nominal and real indicative and market prices of sugarcane in Sindh for the period 2010-11 to 2016-17 are displayed in Table-14 given below:

48. Nominal indicative prices in Sindh increased from Rs 125 per 40 kgs in 2010-11 to Rs 182 per 40 kgs in 2016-17. This counts to 47 per cent increase. Market price usually remained higher than the indicative price except in last three year (2010-11, 2012-13 and 2015-16) when it marginally fell against the indicative price. It proves that indicative price of sugar is not a distortion in the market conditions. The real indicative price of sugarcane during the period under study experienced relatively smooth increasing trend starting from the lowest level of Rs.85.35 per 40 kgs in the base year and the highest level of Rs 98.55 in 2012-13 crops. However, it declined to 86.02 per 40 kgs in the 2016-17. The real market price evidenced same pattern as of real indicative price during the same period.

Table-14: Nominal and Real Indicative & Market Prices of Sugarcane Realized by the Growers in Sindh: 2010-11 to 2016-17

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
2015-16	172	191	202.73	84.94	94.21
2016-17	182	182	211.57	86.02	86.02

Notes:

- * Indicative price of sugarcane at 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, 2016-17.

49. As far as the market price of sugarcane is concerned, it declined gradually from Rs.185 per 40 kgs during 2010-11 to Rs 169 per 40 kgs in 2013-14 but increased again in 2015-16 to Rs 191 only in upper Sindh. However, in 2016-17 again the price decreased as 182 40 kgs, the real market price shows also a depressing situation which remained below the nominal market price throughout the period, under review. It is clear from Table-14 above that the in indicative and real prices of sugarcane are observed stable during the period 2010-11 through 2016-17.

50. It may be observed from the above data that CPI consistently increased during the reference period. Prices have also evidenced a continuous improvement in nominal terms. One striking feature of market prices is that it decreased 4.7 per cent in 2016-17 as compared to 2015-16 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 Sindh in Real Terms

51. 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 price 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. As indicated above, the rising trend in CPI also impacted the real market price of sugarcane in Sindh which recorded at Rs 86.02 per 40 kgs in 2016-17 showing decrease of 32 per cent over the base year. However, nominal indicative price increase in 5.8 per cent against the last year.

52. The real market prices if found in consonance with the nominal market price declining 25 per cent during 2011-12. However, since the nominal indicative price was increased the last year by 23.2 per cent, the corresponding real price improving 11 per cent. During the last year of analysis in 2016-17 both the indicative and market prices improved marginally in real terms.

53. 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 under-mine price actually received by the sugarcane growers. In nutshell indicative price is found to play its envisaged role in stabilizing the sugarcane prices.

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

54. 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).

55. As far as the 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

2015-16 to Rs 191 only in upper Sindh however, in 2016-17 again decreased to Rs182/40 kgs, the real market price shows also a depressing situation which remained below the nominal market price throughout the period, under review. It is clear from Table-15 above that the changes in indicative and real prices of sugarcane is more stable during the period 2010-11 through 2016-17.

56. It may be observed from the above data that CPI consistently increased during the reference period. Nominal prices have also evidences a continuously improvement in nominal terms. One striking feature of market prices is that it increased 5.8 per cent in 2016-17 as compared to 2015-16 which reflects that market is not perfect and the growers may face a higher risk factor for losing returns from their produce. It increased from Rs 172 per 40 kgs in the 2013-14 to Rs 182 per 40 kgs in 2016-17.

11.1 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-15.

Table-15: Impact of Increase in sugar Price on CPI and Household Expenditure

Sugar price	Rise in CPI	Increase in annual expenses on the basis of average per capita sugar availability @ 23.98 kgs per year	
		Per person	Per household
Rs per kg	Per cent	----- Rupees -----	
63.91* Base price			
64	0.0079	2.98	14.934
65	0.0446	47.96	293.8
66	0.0629	71394	448.2
67	0.0812	95392	5973.6
68	0.0995	119.90	747
69	0.1179	143.88	89634
70	0.1545	167.86	1045.8
71	0.1729	191.84	1195.2
72	0.1912	215.82	1344.6

Note: * Price for the month of April 2017 was Rs 63.57 per kg
Average size of household comprises 6.23 members

Source: Pakistan Bureau of statistics (PBS), Islamabad

58. It is evident from the Table-17 that every increase of Rupee 1 per kg over the base price of Rs 63 per kg is expected to raise the CPI by 0.0079 per cent, other things remaining the same. Accordingly, the CPI is likely to increase by 0.05446 and 0.0995 per cent, if sugarcane price is increased by Rs 2 and Rs 5 per kgs.

11.2 Impact on Household Expenditure

59. According to the Household Integrated Economic survey (HIES) during 2015-16 by the PBS, average household in Pakistan consists of 6.23 members. The annual per capita availability of sugar based on the Balance Sheet Method has averaged at 23.98 kgs per annum, 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 Rupee 1 in sugar price over the base level of 63 per kg would raise the CPI by 0.0079 per cent. In addition, the per head and average household expenditure would increase by Rs 23.98 and Rs 149.40 respectively per annum with rise in sugar price by Rupee 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 house expenditure by Rs 298.90 and Rs 747.0 per annum.

12. ECONOMIC EFFICIENCY OF SUGARCANE PRODUCTION IN PAKISTAN¹

12.1 Under Import Situation

12.1.1 No minimal Protection Coefficient (NPC)

60. NPC is the ratio of the market price to the social price of a commodity while social price is the import / export price. It examines the impact of domestic market price of a crop without any consideration to the distortions in the input prices. As a rule of thumb if NPC is greater than one it means that local producers have price protection and if it is less than one it means that domestic producers are implicitly taxed. Implicit taxation to the growers of a particular crop means flow of resources from that particular

¹ Update of this portion is not available from last year, that is why analysis of 2015-16 is included in the policy paper of 2017-18 crop.

crop. It is evident from Table-16 that NPC values for the Punjab province drastically changed during the period 2010-11 to 2013-14. These ranged between 0.78 and 1.28, it implies that sugarcane growers are gaining price protection in Pakistan while they were implicitly taxed in 2010 to 2012. Similar trend remained in the Sindh province.

Table-16: Nominal and Effective Protection Coefficients for Sugarcane in Pakistan

Year	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)	Nominal Protection Coefficient (NPC)	Effective Protection Coefficient (EPC)
	Punjab		Sindh	
2010-11	0.78	0.72	0.78	0.74
2011-12	0.90	0.83	0.93	0.89
2012-13	1.21	1.28	1.20	1.26
2013-14	1.28	1.39	1.21	1.28

Source: Annex-VIII & IX.

12.1.2 Effective Protection Coefficient (EPC)

61. EPC is the ratio of the difference between the revenue and the cost of tradable inputs at the private prices and the difference between the revenue and the tradable inputs cost at social prices. Thus EPC is the indicator of the net incentive and disincentive effects of all policies affecting prices of tradable output and inputs. EPC greater than one means that private profit is higher than it could be without government intervention in the input/output market. In contrast EPC less than one indicates that net effect of policies that net effect of input/output pricing policies is reduction in private profits. In the former case, there is domestically protection to the producers of the commodity while in the later case they are implicitly taxed which discourages domestic production. The above referred Table-18 presents EPC estimates. EPC values for 2010-11 to 2013-14 show significant variations. In 2012-13 EPC value suddenly jumped to the level 1.28 from 0.83 in 2011-12 which further increased to 1.39 in 2013-14. The underlying reason is increase in domestic price of sugarcane in 2012-13 and onward.

12.1.3 Domestic Resource Cost Coefficient

62. DRC is the ratio of the social cost on domestic factors to value added at social prices. If DRC is less than one it implies comparative advantage as the domestic production can save foreign exchange at costs less than the corresponding cost of imports. When DRC is greater than one, it indicates comparative disadvantage in domestic production as in such situations import of a commodity is 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-17. Data on private and social profitability for analysis period are produced in Annex-IX and X.

Table-17: Domestic Resource Cost Coefficient (DRC) for Sugarcane in Punjab and Sindh Provinces

Year	DRC Coefficient (Punjab)	DRC Coefficient (Sindh)
2010-11	0.29	0.27
2011-12	0.63	0.57
2012-13	0.87	0.77
2013-14	0.19	0.82

Source: Annex-X and XI.

63. It is visible from data in the above table that for most of the time Domestic Resource Cost coefficients are substantially below one which indicate Pakistan's comparative advantage in sugarcane production under import situation. In other words domestic resource cost would be less than the corresponding import expenditure. Therefore, it would be an economic proposition to invest in wheat production and marketing at home rather to import.

12.2 Under Export Situation

64. Economic efficiency indicators for sugarcane production in Pakistan under export scenario are presented in Table-18. It may be seen from the NPC and EPC estimates that

almost all of them are above one which imply that resource use efficiency in sugarcane production for export purposes is low the underlying explanation is that export parity price of sugarcane is less than the domestic price of sugarcane.

Table-18: Nominal and Effective Protection Coefficients for Sugarcane in Pakistan

Year	Nominal Protection coefficient (NPC)	Effective Protection coefficient (EPC)	Nominal Protection coefficient (NPC)	Effective Protection Coefficient (EPC)
2010-11	0.96	0.93	0.94	0.92
2011-12	1.10	1.10	1.13	1.15
2012-13	1.56	1.98	1.51	1.78
2013-14	1.77	2.00	1.67	1.85

65. So far as DRCs are concerned, if value of DRC is less than one it indicates that a particular crop has comparative advantage in the respective crop and the vice versa. DRC values under export scenario may also be observed in Table-19. It is clear that here DRC values are higher than one during 2011-12 and 2012-13 which means that for Pakistan export purpose production of sugarcane is not a viable option.

Table-19: Domestic Resource Cost Coefficient (DRC) for Sugarcane in Punjab and Sindh Provinces under Import Scenario

Year	DRC Coefficient (Punjab)	DRC Coefficient (Sindh)
2010-11	0.37	0.34
2011-12	0.83	0.74
2012-13	1.30	1.08
2013-14	1.84	1.35

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

13.1 Domestic Demand, Supply and Stocks

66. The sugar production from 2016-17 (Oct-Sept) crop has been estimated at 7.05 million tons. Adding 1.87 million tons of leftover stocks from 2015-16, the total sugar supply for 2016-17 consumption year is estimated to 8.92 million tons. Based on

average per capita availability of sugar estimated at 20.63 kgs during 2014-16, total domestic requirement for a population of 207.77 million has been worked at 4.29 million tons for 2016-17. Thus, there is 4.62 million tons of surplus sugar available at country level for export during 2016-17. (Table-20, Annex-XII).

Table-20: Domestic Situation of Sugar During 2016-17

S.No.	Items	Data (million)
1.	Opening stocks left over from 2015-16	1.87
2.	Production 2016-17	7.05
3.	Total supply for 2016-17	8.92
4.	Imports	0.00
5.	Exports	0.02
6.	Population	207.77
7.	Requirement	4.29
8.	Likely surplus in 2016-17	4.62

13.2 Behaviour of Sugar Prices in Domestic Market

67. The monthly average wholesale prices of sugar in Karachi, Hyderabad, Lahore, Faisalabad and Peshawar markets during 2016 and 2017 (Jan-June) are presented in Annex-XIII, while for the last 14 years in Annex-XIV.

68. During 2015, average monthly wholesale prices ranged between Rs 5300 per 100 kgs in Hyderabad during January 2016 to Rs 7300 per 100 kgs in Peshawar during October 2016. During 2017 (Jan-June), average monthly wholesale prices ranged between Rs 5175 per 100 kgs in Faisalabad market (June 2017) and Rs 7400 per 100 kgs in Peshawar market (June 2017). The overall average of sugar price at country level ranged between Rs 5533 to Rs 6894 per 100 kgs during 2016-17.

14. WORLD SUPPLY, DEMAND, STOCKS, TRADE AND PRICES OF SUGAR

14.1 Supply, Demand, Stocks and Trade

69. The data on world balance sheet of sugar (raw equivalent) for the period of 2014-15 to 2016-17 are presented in Table-21.

**Table-21: World Balance Sheet of Sugar (Raw Equivalent):
2014-15 to 2016-17 (October-September)**

S.No.	Item	2014-15	2015-16	2016-17	Changes 2016-17 over 2015-16
		----- Million tones -----			
1.	Opening stocks	85.61	87.41	82.35	(-)5.79
2.	Production	169.61	166.50	168.72	(+)1.33
3.	Total supply (1+2)	255.22	253.91	251.07	(-)1.12
4.	Disappearance (consumption)	167.81	171.33	174.91	(+)2.09
5.	Stock adjustment*	0.00	0.23	0.07	
6.	Ending stocks	87.41	82.35	76.23	(-)7.46
7.	Trade (export)	57.58	59.35	57.70	(-)2.78

Note: * Including adjustment for unknown net trade.

Source: Quarterly Market Outlook, International sugar Organization, May 2016.

70. The world sugar production was estimated at 166.50 million tons during 2015-16, 1.80 million tons (2.10 per cent) lower than the last year level of 169.61 million tones. Accounting for the opening stocks of 87.41 million tonnes, global supply of sugar in 2015-16 was reported at 253.91 million tons (0.51 per cent) lower than 2014-15. The world consumption in 2015-16 was estimated at 171.33 million tons, 2.10 per cent higher than the last year level of 167.81 million tons. End year stocks in 2015-16 were estimated at 82.35 million tons, 5.79 per cent lower than last year.

71. According to International Sugar Organization, world sugar production during 2016-17 is forecast at 168.72 million tones, 1.33 percent higher than last year's production. Accounting for the opening stocks of 82.35 million tonnes, global supply of sugar in 2016-17 has projected at 251.07 million tonnes 1.12 percent lower than 2015-16. The world consumption in 2016-17 is projected at 174.91 million tonnes, 2.09 per cent higher than last year. End year stocks are expected to decrease to 76.23 million tonnes. If this forecast becomes true the prices in international market may increase.

14.2 International Prices of Sugar

72. The international prices of raw (fob Caribbean ports) and white (fob London) sugar from 2003-04 to 2016-17 are presented in Annex-XV.

73. The prices of both raw and white sugar have fluctuated widely during the period under review. During 2005-06, the prices of raw sugar averaging at US \$ 327.15 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 of price during the period under review. From 2011-12 prices started decreasing and reached at \$ 307.69 per tonne. However during 2015-16, prices are showing upward trend and reached at \$ 376.40 per tonne during 2016-17. The prices of white sugar during the period under reference have almost followed similar pattern to those of raw sugar.

15. IMPORT AND EXPORT PARITY PRICES OF SUGAR CANE

74. Estimation of import parity price of a commodity is aimed to determine the opportunity cost of resources used in its domestic production while the export parity prices are helpful in ascertaining its competitiveness in international market. Since Pakistan has been importer of sugar in some years and exporters in the others, both the import and export parity prices of sugarcane have been worked out for analyzing price policy options for the next crop season. 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-22.

Table-22: Import/Export Parity Prices of Sugarcane as Worked back from Average fob(London) Prices of Sugar

Average fob London prices of white sugar per tone	Sugarcane prices (Rs/40 kgs)	
	Punjab	Sindh
Import parity		
US \$ 396.54 (June 2017)	141.56	131.99
US \$ 503.78 (Oct.-June)	172.92	161.23
US \$ 433.81 (2013-14 to 2015-16)	152.46	142.15
Export parity		
US \$ 371.92 (Sept 2018)	104.44	97.38
US \$ 464.16 (Oct 2017 to September 2018)	134.31	125.23
US \$ 433.81 (2014-15 to 2016-17)	114.82	107.06

Source Annexes -XVI and XVII.

16. MILL-GATE PRICES OF SUGARCANE BASED ON DOMESTIC WHOLE SALE PRICES OF SUGAR DURING 2016-17 CONSUMPTION YEAR

75. Sugarcane prices have also been estimated from the wholesale prices of sugar during the 2014-15 consumption year and presented in Table-17. This analysis is based on actual sucrose recovery as reported by the PSMA; processing cost of sugar and Federal Excise Duty @ 8 percent. A summary of sugarcane prices estimated under this scenario from various wholesale prices of sugar is presented in Table-23 while the details are given in Annex -XVIII.

Table-23: Sugarcane Prices Estimated from Expected Wholesale Prices of Sugar during 2016-17

Wholesale prices of sugar (Rs /Tonnes)	Sugarcane prices (Rs/40 Kgs)	
	Punjab	Sindh
Rs 60,000	143.18	133.50
Rs 65,000	155.12	144.63
Rs 70,000	167.05	155.75

17. MARKETING OF SUGARCANE

76. Sugarcane is one of the main cash crops of Pakistan and sown on vast areas throughout the country. As it cannot be stored after harvesting, so is to be processed either into gur/khandsari at the farms or crushed by sugar mills for sugar manufacture. So its marketing plays an important role in this respect. For having an upto date information in this respect API conducted an annual field survey in the main sugarcane producing areas.

- Underweighment

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

farmers bringing cane remained unaware about the readings of these scales. The quantity underweighed varied from place to place and for each mill area. The underweighment was reported upto 40 – 50 maunds per trolley load.

- **Undue deductions**

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

- **Delayed payments**

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

- **Presence of middlemen**

80. The role of middleman in sugarcane marketing is increasing, in the current scenario, the importance of middleman cannot be denied as it facilitates the marketing transactions between buyers and sellers. The middleman purchases cane from farmers at less price as compared to mill gate price and pays to the farmers on the spot. Since growers are in need of immediate payments for their sale proceeds, they in order to avoid the delayed payments are compelled to sell their produce at discount rates varying from area to area, In order to improve the situation, the mills may be compelled to make the payments for sale proceeds at the earliest, so that need for selling sugarcane by farmers to

the middleman at discount rate may be minimized. The role of middlemen needs to be eliminated by putting restrictions on their involvement through the use of administrative/legal laws or it should be regularized through rules and regulation.

- Use of sugarcane cess fund

81. The sugarcane cess fund can be utilized for research and development of sugarcane crop. Huge amounts of sugarcane cess fund are lying unutilized with the district/provincial governments, due to lack of proper coordination, planning and decision making. The Provincial Cane Commissioners are mainly responsible for regulating the affairs relating to development, marketing and processing of sugarcane in their respective provinces. Moreover, it is also recommended that unutilized amounts of sugarcane cess fund may be used for the improvement of education and health purpose for sugarcane growers.

18. VALUE-ADDITION AND VERTICAL INTEGRATION IN SUGAR INDUSTRY

82. In view of the falling trend in the world prices of sugar and large-scale investments in the domestic sugar industry it is imperative to improve the efficiency of resource use in sugarcane production and its processing. For improving the productivity in sugar processing the requirement is not only to improve the efficiency but also value addition through vertical integration. In the wake of fast approaching globalization and WTO requirements the sugar industry of Pakistan which relies on sugar manufacturing only and has not paid much attention to the production of other value added products, would also have to go into value adding business.

19. IMPROVING PRODUCTIVITY

83. This demand-led horizontal expansion in cane production has not only resulted in extension of sugarcane cultivation to marginal areas but also aggravated the water shortage. Sugarcane a high water delta crop poses serious competition to other important

crops: cotton, rice, wheat, etc. Thus, sugarcane area already spanning over one million hectares, given the recurring water shortages and the increasing demand for water from other crops and non-farm uses is no more a viable option. With the increasing requirements of other food and cash crops to meet the ever expanding demand from burgeoning population, it is of utmost importance to increase the productivity of resource use in agriculture through all the possible means.

84. On the basis of available evidence, there exists a vast scope for the improvement in yield of cane and its sucrose contents through improved crop management as well as its processing. The progressive cane farmers in Pakistan usually harvest around 40 tonnes of sugarcane per acre while the average farmers do not go beyond 20 - 25 tonnes. The potential of existing cane varieties under optimal conditions of inputs use is 50 tonnes or so. A number of factors/constraints have been identified by the API in this context in consultation with the crop experts and farmers.

19.1 Varietal Development

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

19.2 Land Preparation

86. Sugarcane is generally cultivated after cotton and rice. Being deep rooted crop deep ploughing followed by disc/harrow is necessary to provide better conditions for proper development of root system. High cost of the operation/non-availability of needed equipment on custom hire rates are also a major constraint. The Agriculture Extension

Departments need to launch educational campaigns to apprise the farmers about the proper methods of land preparation for sugarcane cultivation.

19.3 Provision of Seed of Approved Varieties

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

19.4 Low Plant Population

88. Lack of adequate plant population remains an important factor in low productivity of sugarcane. The research on sugarcane has found that even good quality seed does not provide more than 60 per cent germination implying that quantity of seed should be so adjusted to get optimum crop stand and in turn optimum crop yield. In general 80-100 maunds seed of thin and 100-120 maunds of thick varieties of cane is recommended for cultivating one acre. The use of sugarcane planter may be used for proper and effective sowing of sugarcane.

19.5 Balanced Use of Fertilizers

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

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

- **Use of Press Mud/organic Matter**

91. As a result of intensive cropping most of our lands/soils have become deficient in organic matter and in turn possess poor texture. This phenomenon has affected output-input response causing economic losses. Organic matter of these soils can be improved/compensated through adding composts, FYM and adopting green manuring practices but intensive cropping does not allow this. Press mud is a waste and by product of sugar industry containing 2 per cent of N, 4 per cent of P_2O_5 and 1 per cent of K_2O . Presently, the press mud is used as fuel in brick kilns which is a dual loss to the society, firstly through destroying useful nutrients and secondly through causing pollution in the atmosphere. The provincial governments need to discourage burning of press mud as fuel and promoting its use as organic matter/manure in crop production.

- **Plant Protection**

92. It is found that proper inter-culture and hoeing after 60-80 days of crop sowing effectively in eradicating the weeds. However, high cost of labour beside its shortage results in ineffective control of weeds. Use of weedicides to eradicate weeds is the fore strongly advised.

- **Control of diseases**

93. Sugarcane is attacked by a number of diseases. These diseases greatly influence cane yields and sucrose recovery. The most prevalent diseases are red rot, wilt, whip smut, mosaic, and ratoon stunting. Some of these diseases are difficult to identify by farmers, but their attacks cause considerable reduction in yield. Most of the diseases are seed borne. To guard against seed and soil borne diseases the seed treatment with fungicides is necessary. Hot water treatment of seed against diseases like red rot has also been found beneficial and needs to be popularized and the sugar mills can only be affective in this context. The Provincial agriculture departments should launch an educational campaign for the growers and the sugar mills on the subject.

- **Biological control of sugarcane pests**

94. Sugarcane crop is attacked by borers, termites, pyrilla, bugs etc which cause 10-35 per cent loss in production and 0.25 to 1.25 per cent in sucrose recovery. Generally chemical control measures are recommended for protecting the crop from the above mentioned pests/insects. The Integrated Pest Management (IPM) technology based on the use of cultural methods and biological measures to control sugarcane pests and diseases is better solution as compare to chemical control.

95. The identification of species of trichograma and other parasites/predators for controlling sugarcane pests is no doubt a good achievement of research but exploitation of real benefits of this technology needs artificial rearing of parasites/predators of sugarcane pests on commercial scale and their adoption by the growers. The public sector institutions do not have sufficient resources for this task, Therefore, sugar mills, also being the direct beneficiaries of increased production and improved quality of the produce, need to spearhead the cause of IPM. Various cultural practices in controlling the pests and in the distribution and adoption of biological control techniques.

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6. Syed Riaz Ali Shah, Assistant Chief
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Director General
Agriculture Policy Institute
Government of Pakistan
Islamabad

**PROVINCE-WISE AREA, PRODUCTION AND YIELD OF SUGARCANE
IN PAKISTAN : 2005-06 TO 2016-17**

YEAR	PUNJAB	SINDH	KPK	BALUCHISTAN	PAKISTAN
AREA ----- 000 hectares -----					
2006-07	711.8	214.7	101.8	0.5	1028.8
2007-08	827.2	308.8	104.8	0.5	1241.3
2008-09	666.5	263.9	98.2	0.8	1029.4
2009-10	607.4	233.9	100.8	0.7	942.8
2010-11	672.2	226.4	88.4	0.6	987.6
2011-12	761.2	189.7	105.9	0.7	1057.5
2012-13	767.7	253.7	106.7	0.7	1128.8
2013-14	756.8	297.6	117.4	0.7	1172.5
2014-15	710.6	316.7	112.5	0.7	1140.5
2015-16	705.4	312.8	112.7	0.7	1131.6
2016-17	777.8	320.5	118.6	0.7	1217.6
YIELD ----- Tonnes per hectare -----					
2006-07	52.7	58.4	45.6	50.6	53.2
2007-08	48.7	60.9	45.7	56.2	51.5
2008-09	48.5	50.4	44.9	47.4	48.6
2009-10	51.6	57.7	44.7	50.9	52.4
2010-11	55.8	60.8	45.6	51.3	56.0
2011-12	56.3	56.9	44.2	44.0	55.2
2012-13	56.0	62.9	44.7	45.0	56.5
2013-14	57.7	61.7	45.7	46.0	57.5
2014-15	57.8	52.5	45.4	45.1	55.1
2015-16	59.5	57.5	48.8	45.3	57.9
2016-17	63.8	63.1	47.5	45.1	62.0
PRODUCTION ----- 000 Tonnes -----					
2006-07	37542.0	12529.2	4645.1	25.3	54741.6
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	30.8	58396.4
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	41074.3	16613.8	5107.0	31.6	62826.7
2015-16	41968.2	17984.3	5498.3	31.7	65482.5
2016-17	49613.0	20208.9	5628.7	31.6	75482.2

Sources: Agricultural Statistics of Pakistan, NFS&R, Islamabad.

**PROVINCE-WISE AREA ,PRODUCTION AND YIELD OF SUGARCANE
IN PAKISTAN : 2005-06 TO 2016-17**

YEAR	PUNJAB	SINDH	KPK	BALUCHISTAN	PAKISTAN
AREA ----- 000 acres -----					
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	2.0	2543.7
2009-10	1500.9	578.0	249.1	1.7	2329.7
2010-11	1661.1	559.5	218.4	1.5	2440.4
2011-12	1881.0	468.8	261.7	1.7	2613.2
2012-13	1897.1	626.9	263.7	1.7	2789.4
2013-14	1870.1	735.4	290.1	1.7	2897.4
2014-15	1756.0	782.6	278.0	1.7	2818.3
2015-16	1743.1	773.0	278.5	1.7	2796.3
2016-17	1922.0	792.0	293.1	1.7	3008.8
YIELD ----- Tonnes per acre -----					
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	47.38	48.62
2009-10	51.57	57.74	44.72	50.86	52.37
2010-11	55.76	60.81	45.59	51.33	56.00
2011-12	56.35	56.87	44.23	44.00	55.22
2012-13	55.99	62.93	44.71	45.00	56.48
2013-14	57.75	61.70	45.67	46.00	57.54
2014-15	57.80	52.46	45.40	45.14	55.09
2015-16	59.50	57.49	48.79	45.29	57.87
2016-17	63.79	63.05	47.46	45.14	61.99
PRODUCTION ----- 000 Tonnes -----					
2006-07	92769.6	30960.8	11478.5	62.5	135271.3
2007-08	99599.7	46441.4	11841.5	69.4	157952.0
2008-09	79803.1	32876.1	10893.8	93.7	123666.6
2009-10	77404.4	33373.0	11139.4	88.0	122004.8
2010-11	92618.9	34018.0	9959.2	76.1	136672.2
2011-12	105992.4	26658.8	11575.3	76.1	144302.7
2012-13	106212.3	39453.9	11787.6	77.8	157531.6
2013-14	107996.4	45375.4	13248.5	79.6	166699.9
2014-15	101498.2	41054.2	12619.8	78.1	155250.3
2015-16	103707.1	44440.8	13586.8	78.3	161813.0
2016-17	122598.1	49938.0	13909.0	78.1	186523.2

Sources: Agricultural Statistics of Pakistan, NFS&R, Islamabad.

DISTRICT- WISE AREA, YIELD AND PRODUCTION OF SUGARCANE
AVERAGE OF 2014-15 TO 2016-17

AN/ IEX-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
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PUNJAB

1	R.Y.Khan	138.82	10661.72	15.82	76.80
2	Faisalabad	102.17	5648.92	8.38	55.29
3	Sargodha	60.37	3028.43	4.49	50.16
4	Muzaffargarh	44.89	2781.33	4.13	61.96
5	Jhang	49.40	2749.21	4.08	55.65
6	T.T.Singh	39.89	2291.39	3.40	57.44
7	Chiniot	41.18	2245.09	3.33	54.52
8	Rawalpindi	30.16	2219.77	3.29	73.59
9	Kasur	31.77	1634.95	2.43	51.45
10	Bahawalpur	21.62	1413.92	2.10	65.41
11	Bhakkar	22.73	1238.86	1.84	54.50
12	M.B.Din	21.91	1039.76	1.54	47.45
13	Vehari	16.74	998.49	1.48	59.63
14	Bahawalnagar	13.38	778.39	1.16	58.16
15	Layyah	13.80	751.24	1.11	54.45
16	Nankana Sahib	14.35	748.15	1.11	52.12
17	Okara	19.51	645.74	0.96	47.80
18	D.G.Khan	7.68	466.49	0.69	60.72
19	Khanawal	6.97	437.27	0.65	62.75
20	Khusab	7.67	371.43	0.55	48.45
21	Sahiwal	6.00	297.28	0.44	49.57
22	Hafizabad	5.73	256.13	0.38	44.72
23	Multan	3.63	184.92	0.27	50.92
24	Sheikhupura	2.65	135.75	0.20	51.29
25	Mianwali	2.51	124.65	0.18	49.60
26	Lodhran	1.96	122.68	0.18	62.73
27	Pakpattan	2.23	113.18	0.17	50.85
28	Gujrat	2.09	88.13	0.13	42.19
29	Gujranwala	1.68	64.03	0.10	38.22
30	Narowal	1.68	54.42	0.08	32.48
31	Sialkot	1.25	39.45	0.06	31.53
32	Lahore	0.41	20.89	0.03	50.51
33	Jhelum	0.41	15.69	0.02	37.93

KHYBER PAKHTUNKHWA

1	D.I.Khan	27.93	1523.56	2.26	54.55
2	Charsadda	31.29	1429.42	2.12	45.68
3	Mardan	31.38	1384.10	2.05	44.11
4	Peshawar	9.36	474.94	0.70	50.76
5	Nowshera	5.02	255.23	0.38	50.84
6	Malakand	4.87	186.65	0.28	38.32
7	Swabi	2.09	80.04	0.12	38.27
8	Bannu	0.66	25.83	0.04	39.27
9	Khyber AG.	0.69	15.77	0.02	22.85
10	Lakki Marwat	0.24	9.37	0.01	39.18
11	Mohmand AG.	0.25	7.37	0.01	29.98
12	Tank	0.23	4.56	0.01	19.63
13	Kohat	0.13	4.48	0.01	34.48
14	Haripur	0.11	3.34	0.00	31.20
15	F.R.D.I.Khan	0.09	2.17	0.00	22.90
16	Bunir	0.06	1.70	0.00	26.19
17	D.Ir Lower	0.05	1.37	0.00	28.43
18	F.R.Peshawar	0.02	0.47	0.00	30.01
19	Hangu	0.01	0.44	0.00	32.56
20	F.R.Bannu	0.08	0.29	0.00	3.78
21	Mansehra	0.01	0.19	0.00	23.81

Sub Total	731.23	43667.13	64.81	58.72	Sub Total	114.56	5411.29	8.03	47.23
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SINDH

1	Ghotki	46.25	2719.56	4.04	58.80
2	Thatta	35.28	2089.96	3.10	59.24
3	Badin	43.31	2007.10	2.98	46.34
4	Nawabshah	31.72	1906.79	2.83	60.11
5	Tando Muhammad I	23.52	1473.74	2.19	61.60
6	N.Feroze	21.40	1241.83	1.84	58.04
7	Tando Allahyar	20.46	1238.23	1.84	60.52
8	Mirpurkhas	19.24	1228.50	1.82	63.84
9	Khalipur	21.40	1212.72	1.80	56.68
10	Matlari	14.64	926.88	1.38	63.33
11	Sanghar	14.81	882.92	1.31	59.61
12	Sukkur	6.81	396.17	0.59	58.21
13	Hyderabad	6.45	368.85	0.55	57.17
14	Dadu	5.93	314.95	0.47	53.14
15	Unarkot	2.25	116.75	0.17	51.96
16	Tharparikar	0.79	44.28	0.07	56.09
17	Larkana	0.69	37.57	0.06	54.36
18	Jamshoro	0.66	31.11	0.05	46.99
19	Shikarpur	0.43	21.26	0.03	49.94
20	Jacobabad	0.18	6.39	0.01	34.62
21	Shadadkot	0.07	3.28	0.00	45.19
22	Kashmore	0.00	0.14	0.00	47.92

BALUCHISTAN

1	Sibi	0.61	29.29	0.04	47.92
2	Lasbela	0.05	2.30	0.00	51.21

Sub Total	316.69	18268.98	27.11	57.69	Sub Total	0.66	31.60	0.05	48.19
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Pak Total	1163.16	67378.00	100.00	57.83
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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

ANNEX-IV

YIELD PER HECTARE OF MAJOR SUGARCANE PRODUCING COUNTRIES IN THE WORLD:2017 CROP

S.No.	Country	Yield (tonnes)ha	S.No.	Country	Yield (tonnes)ha
1	Peru	121.25	26	Burundi	74.69
2	Guatemala	121.01	27	Brazil	74.48
3	Senegal	118.01	28	Mauritius	74.31
4	Egypt	112.70	29	Mexico	73.78
5	Malawi	107.66	30	Mali	72.52
6	Chad	103.04	31	Kenya	70.18
7	Zambia	102.59	32	Sierra Leone	69.78
8	Burkina Faso	100.54	33	India	69.74
9	Eswatini	96.14	34	Uganda	67.54
10	Nicaragua	96.02	35	Philippines	66.95
11	Portugal	88.37	36	Mozambique	66.85
12	El Salvador	88.07	37	Japan	66.75
13	French Polynesia	87.23	38	South Africa	65.74
14	Colombia	87.16	39	Viet Nam	65.29
15	Honduras	83.31	40	Costa Rica	64.47
16	United States of America	82.41	41	Guadeloupe	64.07
17	Ecuador	81.64	42	China, Taiwan Province of	63.72
18	Iran (Islamic Republic of)	80.74	43	Myanmar	63.52
19	Australia	80.63	44	Panama	63.28
20	Côte d'Ivoire	79.39	45	Haiti	63.16
21	Zimbabwe	78.11	46	Venezuela (Bolivarian Republic of)	62.07
22	Sudan	78.06	47	Gabon	61.96
23	China, mainland	76.15	48	French Guiana	61.82
24	RÅ©union	75.28	49	Lao People's Democratic Republic	60.65
25	Thailand	75.24	50	Pakistan	60.32
World average					70.89

Source: World statistics year book 2017

AVERAGE FARMER COST OF PRODUCTION OF SUGARCANE IN PUNJAB DURING 2016-17 AND 2017-18

Sr. No.	Operations / inputs	Average no. of operations /acre	2016-17 crop		2017-18 crop		Change in 2017-18 over 2016-17
			Rate per unit	Cost per acre	Rate per unit	Cost per acre	
1	Land preparation:						
	1.1 Deep ploughing	0.476	1500	714	1400	666	-47.60
	1.2 Rotavator	0.152	1600	243	1500	228	-15.20
	1.3 Ploughing	7.847	650	5101	650	5101	0.00
	1.4 Planking	3.309	350	1158	325	1075	-82.73
	1.5 Laser levelling	0.561	650	365	1800	1010	645.15
2	Seed bed preparation:						
	2.1 Ploughing/ furrow making	0.467	650	152	650	152	0.00
	2.2 Planking	0.193	350	34	325	31	-2.41
	2.3 Trench/Ridge making						
	2.3.1 Manual	0.106	350	18.55	400	21	2.65
	2.3.2 Tractor	0.700	650	228	650	228	0.00
	2.4 Bund making						
	2.4.1 Manual (M.day)	1.655	350	290	400	662	372.38
	2.4.2 Tractor	0.158	650	51	650	51	0.00
3	Seed and Sowing operations:						
	3.1 40 kg units	6.578	195	641			
	3.2 Manas	10.640	950	5054	1000	5320	266.00
	3.3 Harvesting, stripping (m.days) and making of sets	4.786	350	839			-839.30
	3.4 Transport (Contract)	80.0		400			-400.00
	3.5 Sowing of sets (m.days)	0.781	350	137			-136.68
	3.6 Contract sowing including harvestin stripping and transport			400		3500	3100.00
4	Irrigation:						
	4.1 Canal/Scarp tubewell	8.900		250.00		250.00	0.00
	4.2 Private Tubewell	4.440	1100	4884	694	3082	-1801.75
	4.3 Mixed	2.160	250	540	150	324	-216.00
5	Labour for irrigation and water course cleaning (m. days)	4.880	350	1701	400	1944	243.00
6	Interculture and Earthing up:						
	6.1 Manual/blnding of plants	0.609	1400	853	1300	792	-60.90
	6.2 With tractor	2.008	700	1406	650	1305	-100.40
7	Plant Protection including application charges:						
	7.1 Weedicides	0.124	650	81	650	81	0.00
	7.2 Granules	0.120	600	72	600	72	0.00
	7.3 Sprays	0.305	700	214	650	198	-15.25
8	Farm yard manure including transport: and application (50%)						
	8.1 Material cost	2		1500	1525	1525	25.00
	8.2 Transport & application cost			1300	1050	2100	800.00
9	Fertilizers: (bags)						
	9.1 DAP	1.280	3700	4736	2500	3200	-1536.00
	9.2 Urea	1.730	1875	3244	1400	2422	-821.75
	9.3 Nitrophos	0.350	2650	928	2500	675	-52.50
	9.4 SSP	0.010	967	10	1125	11	1.58
	9.5 CAN	0.010	1609	16	1625	16	0.16
	9.6 SOP	0.070	4900	343	3780	265	-78.40
	9.7 Gypsum	0.440	200	88	200	88	0.00
10	Fert. transport and application	3.890	80	311	100	389	77.80
11	Gross cost (Rs./acre)						
12	Farm Investment (Item 1 to 10 minus 4.1)			38049		36734	-1314.50
13	Mark up @ 12.0 % per annum for 13 months on Item 1 to 10 minus Item 8.1			6183		4775	-1407.48
14	Land rent for 13 months		23000	24917	24000	26000	1083.33
15	Average weighted land tax @ Rs 131/acre/ annum for 13 months			43.00		143.00	0.00
16	Management charges for 13 months			2362.0		2909.4	547.40
17	Harvesting & stripping (40 kg units)		13.0	7273	14.0	8316	1042.52
18	Expected escalation in cost of selected items			2640.0		225.0	335.00
19	Total cost (Items 1 to 15)			81817		82105	286.27
20	Yield (40 kg units)			565.15		600.00	34.85
21	Cost per 40 kgs at farm level:						
	21.1 including land rent	Rs/40kgs		144.77		136.84	-7.93
	21.2 excluding land rent	Rs/40kgs		100.68		93.51	-7.18
22	Marketing expenses: (Rs/40 kgs)						
	22.1 Transport, etc.			14.00		16.00	2.00
	22.2 Development cess			1.00		1.00	0.00
23	Cost of Production (Rs per 40 kgs) at millgate:						
	23.1 including land rent			159.77		153.84	-5.93
	23.2 excluding land rent			115.68		110.51	-5.18
24	Provision for Risk Factor (Rs per 40 kgs)			15.98		15.38	
25	Cost of Production (Rs per 40 kgs) at millgate:						
	25.1 including land rent			175.75		169.22	-6.52
	25.2 excluding land rent			131.66		125.89	-5.77

AVERAGE FARMER COST OF PRODUCTION OF SUGARCANE IN SINDH DURING 2016-17 & 2017-18

Sr. No.	Operations / inputs	Average no. of operations /acre	2016-17 crop		2017-18 crop		Change in 2017-18 over 2016-17
			Rate per unit	Cost per acre	Rate per unit	Cost per acre	
	Land preparation						
1	1.1 Deep ploughing	0.523	1500	784.50	1500	784.5	0.00
	1.2 Ploughing	5.606	1100	6166.60	1000	5606.0	-560.60
	1.3 Planking	1.577	325	512.53	325	512.5	0.00
	1.4 Levelling	0.972	1200	1166.40	1000	972.0	-194.40
2	Seed bed preparation:						
	2.1 Ploughing	1.136	1100	862.22	1000	783.8	-78.38
	2.2 Planking	1.340	325	300.50	325	300.5	0.00
	2.3 Trench/Ridge making:						
	2.3.1 Manual (m.days)	0.074	400	20.42	400	20.4	
	2.3.2 Tractor (hrs)	0.174	1100	132.07	1000	120.1	-12.01
	2.4 Bund making:						
	2.4.1 Manual (M. days)	0.403	400	111.23	400	111.2	0.00
	2.4.2 tractor (hrs)	0.812	1100	616.31	1000	812.0	195.69
3	Seed and Sowing operations:						
	3.1 40 kg units	64.118	190	8405.87	201	8892.5	486.66
	3.2 Ghuntas	0.685	5000	2363.25	5000	2363.3	0.00
	3.3 Contract sowing	1.000	3000	3000.00	3500	3500.0	500.00
4	Interculture and Earthing up:						
	4.1 Manual	1.762	1500	2643.00	1500	2,643	0.00
	4.2 Bullocks/ tractor	1.725	1100	1897.50	1100	1,897.5	0.00
5	Plant protection with appl						
	5.1 Weedicides	0.300	650	195.00	625	187.5	-7.50
	5.2 Granules	0.245	560	137.20	560	137.20	0.00
	5.3 Sprays	0.265	700	185.50	700	185.50	0.00
6	Irrigation						
	6.1 Canal	20.880		181.87		181.87	0.00
	6.2 Private tubewell	2.450	700	1715.00	350	857.50	-857.50
	6.3 Labour for irrigation and water course cleaning (m.days)	5.859	400	2343.60	400	2343.60	0.00
7	Farm yard manure						
	7.1 Material cost		1800	2000.00	2000	2000.0	0.00
	7.2 Transport and application cost		1200	1000.00	1000	1000.0	0.00
8	Fertilizers: (bags)						
	8.1 DAP	1.512	2500	3780.00	2500	3780.00	0.00
	8.2 Urea	3.625	1400	5075.00	1400	5075.00	0.00
	8.3 Nitrophos	0.376	2100	789.60	2100	789.60	0.00
	8.4 CAN	0.239	1600	382.40	1600	382.40	0.00
	8.5 SOP	0.085	5200	442.00	3750	318.75	-123.25
	8.6 Fert. transport and application	5.829	85	495.47	85	495	0.00
9	Farm Investment (Item 1 to 8 minus 6.1)			47523		46872	-651.29
10	Mark up @ 12.0 % per annum for 16 months on item 1 to 10 minus item 6.1 months			9505		7499	-2005.13
11	Land rent for 16 months		20000	26667	25000	33333	6666.67
12	Land tax @ Rs 200/acre/annum for 16 months			266.67		265.67	0.00
13	Drainage Cess			24.00		24.00	0.00
14	Management charges for 16 months			2907.00		2909.40	2.40
15	Harvesting and stripping (40 Kg units)	676	14	9464	16	2000	2535.72
16	Expected escalation in the cost of selected items			2668		2668.00	0.00
17	Total cost (items 1 to 15)			99206		103755	6548.36
18	Yield (40 kg units)			676		750.00	74.00
19	Cost per 40 kgs at farm level:						
	19.1 including land rent			146.75		141.01	-5.75
	19.2 excluding land rent			107.31		96.56	-10.75
20	Marketing expenses: (Rs/40 kgs)						
	20.1 Transport, etc.			14.00		15.00	1.00
	20.2 Development cess			0.32		0.32	0.00
21	Cost of Production (Rs per 40 kgs) at millgate:						
	21.1 including land rent			161.07		156.33	-4.75
	21.2 excluding land rent			121.63		111.83	-9.75
22	Provision for Risk Factor (Rs per 40 kgs)			16.11		15.63	
23	Cost of Production (Rs per 40 kgs) at millgate:						
	23.1 including land rent			177.18		171.96	-5.22
	23.2 excluding land rent			137.73		127.51	-10.22

**ECONOMICS OF SUGARCANE AND COMPETING CROPS AT
PRICES REALIZED BY THE GROWERS: 2016-17 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 inchesRupees per acre.....					RatioRupees.....		
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	80588	20483	93250	72767	12662	1.16	4.53	237	1943
2	Seed Cotton	240	22	53846	17471	58950	41479	5104	1.09	3.37	246	2680
3	Basmati Paddy	180	58	44106	19846	43802	23956	-303	0.99	2.21	243	755
4	IRRI Paddy	180	62	39583	16476	31152	14676	-8432	0.79	1.89	173	502
5	Wheat	180	12	40225	10905	44063	33158	3837	1.10	4.04	245	3672
6	Sunflower (spring)	180	22	41976	14710	49240	34531	7264	1.17	3.35	274	2238
7	Seed Cotton + Wheat	420	34	94071	28376	103013	74637	8941	1.10	3.63	245	3030
8	Seed Cotton+Sunflower	420	44	95822	32180	108190	76010	12368	1.13	3.36	258	2459
9	Basmati Paddy+Wheat	360	70	84331	30751	87865	57114	3534	1.04	2.86	244	1255
10	Basmati Paddy+Sunflower	360	80	86082	34555	93042	58487	6961	1.08	2.69	258	1163
11	IRRI Paddy + Wheat	360	74	79808	27380	75214	47834	-4594	0.94	2.75	209	1016
12	IRRI Paddy+Sunflower	360	84	81559	31185	80392	49206	-1168	0.99	2.58	223	957

Sindh

1	Sugarcane	488	71	90685	26492	113355	86863	22660	1.25	4.28	232	1597
2	Seed Cotton	240	18	49907	14107	55575	41468	5667	1.11	3.94	232	3087
3	IRRI Paddy	180	56	36429	12089	43277	31189	6849	1.19	3.58	240	773
4	Wheat	180	12	37298	10998	41363	30364	4064	1.11	3.76	230	3447
5	Sunflower (spring)	180	22	40579	14050	49160	35110	8581	1.21	3.50	273	2235
6	Seed Cotton + Wheat	420	30	87205	25105	96937	71832	9732	1.11	3.86	231	3231
7	Seed Cotton+Sunflower	420	40	90487	25105	104735	79630	14248	1.16	4.17	249	2618
8	IRRI Paddy+ Wheat	360	68	73727	23087	84640	61553	10913	1.15	3.67	235	1245
9	IRRI Paddy+Sunflower	360	78	77008	26139	92437	66298	15430	1.20	3.54	257	1185

Notes for Annex - VII

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2016-17 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, 2016-17 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 2016-17 crops. To incorporate the escalations in input prices, including fertilizers which occurred during the growing period of 2016-17 crops:

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

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

- 4.1 The minimum guaranteed price of wheat at Rs 1300 per 40 kgs, as maintained by the government for 2015-16 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 1320 and Rs 801 per 40 kgs, respectively. While, the average price of IRRI paddy in Sindh is reported at Rs 713 per 40 kgs.
- 4.3 The wholesale market prices of seed cotton during the post-harvest months of Sep - Feb 2016-17 in the main producer area markets have averaged at Rs 2626 per 40 kgs in the Punjab and Rs 2461 in Sindh.
- 4.4 The price of sunflower 2016-17 crop has been reported hovering around Rs 2050/40 kgs and Rs 2375 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 Sindh, and Rs 35 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.

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

Description	Revenue	Traded Cost	Domestic Factor Cost	Profits
-----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 RESOURCES USE IN SUGARCANE
PRODUCTION IN SINDH**
(Based on import parity prices)

Description	Revenue	Traded Cost	Domestic Factor Cost	Profits
-----Rupees per acre-----				
2010-11				
Private Prices	133510	27804	37399	68307
Social Prices	169386	25296	32903	111187
Transfers	-35875	2509	4497	-42881
2011-12				
Private Prices	112554	36467	47891	28197
Social Prices	120362	33033	42718	44611
Transfers	-7808	3434	5172	-16414
2012-13				
Private Prices	126412	40905	49602	35905
Social Prices	104131	36926	44109	23097
Transfers	22281	3979	5493	12808
2013-14				
Private Prices	129032	41579	51892	29561
Social Prices	102577	35738	45986	20852
Transfers	20456	5841	5906	8709
2014-15				
Private Prices	121680	41447	58469	21764
Social Prices	91450	35005	51335	5110
Transfers	30231	6442	7135	16654

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

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

**ECONOMIC EFFICIENCY OF RESOURCES 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

PER CAPITA AVAILABILITY (CONSUMPTION OF SUGAR: 2013-14 TO 2015-16
(October - September)

S. No	Items	2013-14	2014-15	2015-16
		-----Thousands tonnes-----		
1	Opening stocks as on 1st October	844	1197	319
2	Production	5615	5331	5115
3	Imports	8	14	11
4	Export	735	580	398
5	Closing stocks as on 30th September	1197	1362	1886
6	Net availability (item 1+2+3-4-5)	4535	4600	3161
		-----Million-----		
7	Population	195.43	199.12	202.89
		-----Kgs per annum-----		
8	Per capita availability (consumption)	23.21	23.10	15.58
9	Average per capita availability Average (2013-14 to 2015-16)		20.63	

Note:

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

Sources:

1. For stocks and production:
2. For import and export:
3. For population of Pakistan:

Pakistan Sugar Mills Association, Islamabad.
Federal Bureau of Statistics, Karachi.
Economic Survey, 2016-17.

**DOMESTIC AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR
DOMESTIC MARKETS: 2016 AND 2017**

Month	Lahore	Fasilabad	Karachi	Hyderabad	Peshawar	Average
2016						
	----- Rupees per 100 kgs-----					
January	5453	5713	5400	5300	5800	5533
February	6935	5800	5800	5800	6250	6117
March	5874	5800	5900	5800	6300	5935
April	6100	6188	5950	5850	8500	6518
May	6076	6208	6100	6150	6300	6167
June	6127	6208	6100	6200	6500	6227
July	6111	6515	6500	6400	7000	6505
August	6867	6700	6800	6800	7100	6853
September	6950	6700	6900	6700	7000	6850
October	6781	6788	6800	6800	7300	6894
November	6665	6738	6800	6700	7200	6821
December	5904	5835	6200	6100	6375	6083
Average	6320	6266	6271	6217	6802	6375
2017						
January	6011	6068	6150	6100	6400	6146
February	6000	6040	6100	6100	6200	6088
March	5925	5539	5700	5650	5750	5713
April	5774	5508	5700	5700	5550	5646
May	5676	5309	5650	5500	5500	5527
June	5550	5175	5300	5400	7500	5785
Average	5823	5607	5767	5742	6150	5818

- Sources:
1. Agriculture Marketing Information Services, Punjab, Lahore.
 2. Bureau of Supply and Prices, Sindh, Karachi.
 3. Agriculture Marketing Services, Peshawar, KPK.

**AVERAGE WHOLESALE PRICES OF SUGAR IN MAJOR DOMESTIC MARKETS:
2001-02 TO 2015-16 (October- September)**

Year	Lahore	Fasilabad	Karachi	Hyderabad	Peshawar	Average	Increase(+) decrease(-) in average price over
	----- Rupees per 100 kgs-----						Percent
2002-03	1939	1906	1892	1872	1972	1916	-
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	1.39
2014-15	5726	5634	5463	5529	5564	5583	10.04
2015-16	5694	5632	5562	5691	5678	5651	1.22
2016-17 (Oct-Jun)	6032	5889	6044	6006	6419	6049	7.04

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: 2003-04 to 2016-17 (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
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	13.96	307.69	17.19	378.98	3.23	71.29	18.81
2015-16	16.56	370.19	20.89	460.45	3.23	71.29	18.81
2016-17	17.07	376.40	20.76	464.16	3.68	87.75	17.75

Source: International Sugar Organization (ISO), London.

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

PRICE OF WHITE SUGAR

S.No	Item	Jun 2017		2016-17 (Oct-Jun)		During 2013-14 to 2015-16	
US \$ per tonne							
1.	Average fob (London) price	396.54		503.78		433.81	
2.	Freight charges upto Karachi	60		60		60	
3.	C & f cost at Karachi port	457		564		494	
4.	Exchange rate (Rs/\$)	104.60		104.60		104.60	
Rs per tonne							
5.	C & f cost at Karachi port (Pak rupees)	47754		58971		51653	
6.	Marine insurance @ 0.23 % of c & f cost	110		136		119	
7.	Cif cost at Karachi port	47864		59107		51771	
8.	Landing charges @1% of Cif Value	479		591		518	
9.	L.C opening charges @0.04% of C&F Value	19		24		21	
10.	Bank services charges @0.1% of C&F value	48		59		52	
11.	Provision of shortage & unforeseen losses @0.25% of C&F	119		147		129	
12.	Stevedoring charges	725		725		725	
13.	Clearing & forwarded charges	8		8		8	
14.	Misc: Exp 0.05% of of C&F value	24		29		26	
15.	Wharfage & Weightment	54		54		54	
16.	Importer's profit 2% of C&F value	955		1179		1033	
17.	Transport charges for up country	2200		2200		2200	
18.	Incidental charges incurred on imported sugar	4631		5017		4765	
19.	Ex-mill/ market cost of Imported sugar	52495		64124		56536	
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
20.	Processing cost of sugar (a)	17848	17848	21802	21802	19,722	19222
21.	Value of cane to produce one of sugar (Item 19-Item 20)	34647	34647	42322	42322	37314	37314
22.	Provincial base sugar recovery (Percent)	9.78	10.16	9.78	10.16	9.78	10.16
23.	Quantity of cane in tonnes required to produce on 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)	3538.97	3299.67	4322.97	4030.65	3811.44	3553.71
25.	Price of 40 kgs of cane	141.56	131.99	172.92	161.23	152.46	142.15

Sources:

- i) For average fob (London) price: Annex XV.
- 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.

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

S.No	Item	Jun 2017		2016-17 (Oct-Jun)		During 2013-14 to 2015-16	
		US \$ per tonne					
1.	Average fob (London) price	396.54		503.78		433.81	
2.	Exchange rate (Rs/\$)	104.60		104.60		104.60	
3.	Average fob Karachi price (assuming equivalent to fob London price)	41478		52695		45377	
4.	Transport charges from interior Sindh to port, special packing, inspection transit insurance, loading and unloading, clearing and forwarding and port terminal charges	1800		1800		1800	
5.	Bank commission @ 1.25 % of fob price	518		659		567	
6.	Inspection charges	429		429		429	
7.	Ex-mill price of sugar (item 3 minus items 4 through 6)	38731		49808		42580	
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
8.	Processing cost of sugar (a)	13168	13168	16935	16935	14477	14477
9.	Value of cane to produce one of sugar (item 7-item 8)	25562	25562	32873	32873	28103	28103
10.	Provincial base sugar recovery (Percent)	9.78	10.16	9.78	10.16	9.78	10.16
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)	2611.05	2434.50	3357.82	3130.77	2870.58	2676.48
13.	Price of 40 kgs of cane	104.44	97.38	134.31	125.21	114.82	107.06

Notes:

- i) For average fob (London) price: Annex XV.
- ii) For incidentals and duties: Trading Corporation of Pakistan, Karachi.
- iii) 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 1996 by APCoM and Business & Consultancy Services.

**MIL-GATE PRICES OF SUGARCANE WORKED BACK FROM THE EXPECTED WHOLESALE MARKET PRICES
OF SUGAR DURING 2016-17**

S.No	Item	WORKED BACK PRICES OF SUGARCANE					
		-----Rupees per tonne-----					
1.	Average wholesale market prices of sugar (a)	60000	65000	70000			
2.	Wholesale dealer margin @5% on net price	2655	2876	3097			
3.	Federal excise duty @ 8%	4248	4602	4956			
4.	Net price of sugar (items 1-2-3)	53097	57522	61947			
		Punjab	Sindh	Punjab	Sindh	Punjab	Sindh
5.	Processing cost of sugar (a)	18053	18053	19558	19558	21062	21062
6.	Value of cane to produce one tonne of sugar (item 4-item 5)	35044	35044	37965	37965	40885	40885
7.	Provincial base sugar recovery (Percent)	9.94	10.65	9.94	10.65	9.94	10.65
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)	3580	3338	3878	3616	4176	3894
10.	Price of 40 kgs of cane	143.18	133.50	155.12	144.63	167.05	155.75

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-XIV
For FED: FBR, Islamabad.

