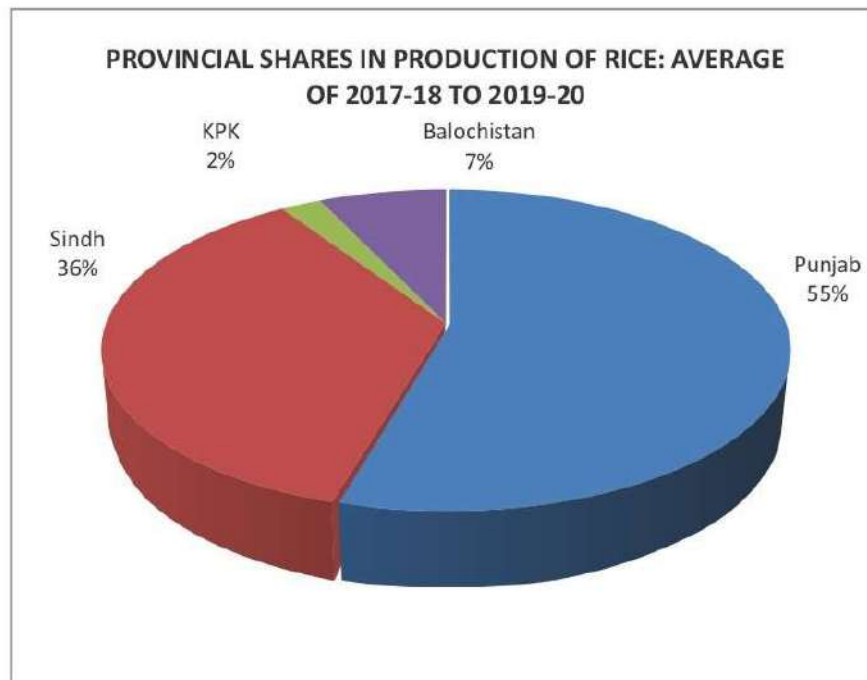




RICE PADDY POLICY ANALYSIS FOR 2020-21 CROP



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ACRONYMS AND ABBREVIATIONS

API	Agriculture Policy Institute
BMR	Balancing Modernization Replacement
COP	Cost of Production
CPI	Consumer Price Index
DR	Dokri Research
DRC	Domestic Resource Cost
E&M	Economics and Marketing
ECC	Economic Coordination Committee of the Cabinet
EPC	Effective Protection Coefficient
FAO	Food and Agriculture Organization
FAQ	Fair Average Quality
FCA	Federal Committee on Agriculture
FOB	Free on Board
FMI	Farm Machinery Institute
FSC&RD	Federal Seed Certification and Registration Department
FYM	Farm Yard Manure
GAP	Good Agriculture Practices
GST	General Sales Tax
IPM	Integrated Pest Management
IRRI	International Rice Research Institute
KS	Kala Shah Kaku
NFS&R	M/o National Food Security and Research
NARC	National Agricultural Research Centre
NIAB	Nuclear Institute for Agriculture and Biology
NPC	Nominal Protection Coefficient
PARC	Pakistan Agricultural Research Council
PASSCO	Pakistan Agricultural Storage and Services Corporation
PBS	Pakistan Bureau of Statistics
PSC	Punjab Seed Corporation
RRI	Rice Research Institute
SSC	Sindh Seed Corporation
WBPH	White Back Plant Hopper
WTO	World Trade Organization

RICE POLICY ANALYSIS FOR 2020-21 CROP

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Findings

1. Area and Production

- Rice production at the country level during the decade ending 2019-20 has grown @ 2.7% per annum owing to 1.5% expansion in area and 1.2% improvement in yield.
- At the country level production of rice from 2019-20 crop is estimated at 7.450 million tonnes which is higher by 2.9% against the 2018-19 production. In Punjab, production in 2019-20 increased by 4.1%, which mainly happened due to 6.6% increase in area of the crop.
- In Sindh, production of rice from 2019-20 crop improved by 0.2% primarily due to 12.4% increase in area of the crop as the yield declined by 1.8%.
- Shares of the Punjab, Sindh and Khyber Pakhtunkhwa in production of rice during the period 2017-18 to 2019-20 average at 54.5%, 36.2% and 9.3%, respectively.

2. Domestic Prices

- Monthly average wholesale market prices of basmati paddy in Punjab during the post-harvest season of 2019-20 ranged between Rs. 1974 and Rs. 2475/ 40 Kg.
- In Sindh, monthly average wholesale market prices of IRRI paddy in major rice producing area markets ranged between 1105 and Rs. 1400 per 40 Kg.

3. Cost of Production

- Net cost of cultivation of basmati paddy in Punjab for 2020-21 crop (inclusive land rent) is estimated at Rs. 57,618 per acre. Based on this estimate the cost per 40 Kg at the market level approximates to Rs. 1746.
- The cost of cultivation of IRRI paddy in Sindh for 2020-21 crop is estimated at Rs. 46343 per acre. Adding to this Rs 55/40 Kg as marketing cost, market level cost of production of IRRI paddy in Sindh comes to Rs. 982 per 40 kgs. Main factors explaining these relatively lessor increase in cost of production estimates are reduction in fertilizer prices.

4. Economics of Rice Paddy and Competing Crops

- Resource allocation among competing enterprises is primarily guided by economic considerations as reflected in their gross cost, gross income, gross margin, net income, output-input ratio, etc. Rice, a major 'kharif' crop, competes with cotton for land, water and other farm resources in the areas where cultivation of both crops is technically feasible.
- Basmati's performance in Punjab in terms of returns to overall investment has been slightly lower than seed cotton. However, in terms of crop duration Basmati has performed better than seed cotton. IRRI paddy in Punjab also could not perform against seed cotton in any of the economic indicators analyzed and cotton out-competed the earlier comprehensively, except crop duration.
- In Sindh, IRRI paddy farming has shown slightly better results in terms of returns to overall investment against seed cotton. In context of indirect competition with sugarcane, the economic position of IRRI with wheat and cotton rotations are healthier than sugarcane in terms of returns to crop duration.

5. Real Prices

- Nominal market price of basmati paddy increased by 23.7% in 2019-20 against the previous year.
- In real terms, the market price of basmati paddy in the Punjab exceeded the base year price throughout the period since 2015-16.
- Both nominal and real market prices of IRRI paddy in Sindh remained higher than the base year level.

6. World Situation

- World production of rice in 2020-21 projected stood at 505 million tonnes which is 1.6% higher than the previous year 2019-20 and 1.4% high than the 2018-19 production (498 Mill. Tonnes).
- Global trade in rice reported at 42 million tonnes in 2019-20 is projected to increase to 45 million tonnes in 2020-21.

7. Export Parity Prices

- On the basis of fob Karachi price of basmati during June 2020 export parity price of basmati paddy at the mill gate is estimated at Rs.2771 per 40 kgs and for IRRI-6 paddy at 1780 per 40 kgs.

8. Economic Efficiency

- Economic efficiency of resources used in rice production has been evaluated by estimating Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC) and Domestic Resource Cost (DRC).
- Basmati growers in Pakistan are implicitly taxed as NPC estimates have been less than one during the period 2015-16 through 2019-20. Similarly EPC value for basmati paddy in Punjab also remained less than one during the referred period.
- In case of IRRI rice in Sindh, NPCs and EPCs for the period 2018-19 and 2019-20 remained less than one showing some implicit tax to the IRRI growers in Sindh.
- DRC indicates the opportunity cost of domestic resources used in the production of a commodity. The DRC less than one indicates a commodity system having comparative advantage and vice versa.
- DRCs for basmati rice have been less than one during the period under review implying that Pakistan has comparative advantage in basmati production.
- DRCs for IRRI paddy in Sindh remained less than one during the period under review (2015-16 and 2016-17 exceptions), indicating comparative advantage for Sindh in IRRI rice for export.

9. World Comparison

- According to 2019 data, Pakistan stands at number 11 in rice area and ranks 10th in terms of production in the world. But in yield, it is far behind other rice producing countries and holds 57th position in the world.
- India is the largest grower of rice in the world with 44.5 million hectares followed by China with 30.2 million hectares and Indonesia cultivating 16.0 million hectares rice.
- In global production of rice, China is on the top with 212.129 million tonnes followed by India with 172.580 million tonnes and Indonesia at 3rd position with 83.037 million tonnes in the world.
- In terms of yield, Australia tops with 10,386 kgs/hectare followed by Egypt with 8827 and USA at 3rd position with 8621 kg/hect while Pakistan claim 3844 Kg/ hect. This indicates that efficient use of resource is directly needed through improvement in productivity.

10. Policy Options

- Based on the analysis of relevant factors covered in the main text of this Report, likely indicative price policy options for rice paddy 2020-21 crop are presented below:

Basis		Worked back price of Rice paddy at mill-gate
		(Rs./40 Kg)
A.	Export parity prices based on actual Fob (Karachi) prices of Pakistani basmati and IRRI rice: i) Basmati	2771
		2909
	ii) IRRI	1780
		1667
B.	Domestic market price of rice paddy during Nov-Dec 2019-20 i) Basmati Punjab ii) IRRI-6 Sindh	2255
		1274
C.	Cost of production at market level for 2020-21 Crop i) Basmati (Punjab) ii) IRRI (Sindh)	1746
		982

Recommendations

In view of the analysis of different factors bearing on price of Basmati and IRRI rice paddy, comments of the participants of API committee meeting on rice paddy, farmers' feedback assembled through the field survey held for paddy 2020-21 crop policy by the API staff, following suggestions are given for consideration and announcing of indicative price and improving productivity and marketing of the commodity.

a. Indicative price of rice paddy for 2020-21 crop

- In view of increase in cost of production of paddy, it is suggested that the Government may consider announcement of indicative price of Basmati and IRRI paddy with a reasonable profit margin to sustain the crop.
- Minimize the prices of pesticides by withdrawing GST on pesticides.
- Give subsidy on fertilizer particularly Urea and DAP, to subside inflationary effect.

- In view of importance of free market and involvement of private sector, actual incentive to paddy growers should come through free play of market forces.

b. Improving productivity

- Government policy for promoting role of ‘service providers’ may be strengthened for wide spread of appropriate production technology in rice cultivation.
- For promoting use of certified seed of rice, Provincial Seed Councils should be taken on board.
- Laser land levelers may be subsidized to promote its use. This may significantly reduce cost of production of the crop.
- Concerted efforts are required to develop rice varieties suitable for dry cultivation.
- Monitoring role of Provincial Department of Agriculture (Extension) for curbing adulteration in pesticides needs to be invigorated.
- Portable dryers may be subsidized to ensure supply of quality rice in the market.
- Price of certified seed, both local and imported, must be closely monitored and controlled.
- Role of Department of Agriculture (Extension) may be strengthened for promoting balanced use of fertilizer.

c. Improving quality and marketing

- Par boiled steaming technology of rice may be encouraged under supervision of qualified technician for standardizing quality of rice.
- Performance of Provincial Crop Reporting Service (CRS) needs to be enhanced by providing mini threshers (portable) for measuring yield of rice paddy.
- Under WTO Rules, considerable subsidy is permissible for undertaking research. It is suggested to advance more funds for evolving new hybrid varieties of rice.

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Director General

RICE POLICY ANALYSIS FOR 2020-21 CROP

INTRODUCTION

1. Rice plays an important role in Pakistan's agrarian economy. It is second staple food of the country. It also makes significant contribution in the foreign exchange earnings of the country. Rice industry is an important source of employment and income for rural people.

2. Rice accounts for 3.1% of the value added in agriculture and 0.6% of GDP. Area under rice during 2019-20 was 3.034 million hectares. Rice production in the country consists of Basmati, IRRI and 'Other' varieties. All these cumulatively turned out 7.410 million tonnes during 2019-20¹. All of these varieties have sufficient export and domestic consumption demand of the local population.

3. Though rice is cultivated in all of the four provinces at varying levels of production Basmati is long grain aromatic variety mainly produced in Punjab while Sindh leads in coarse (IRRI) varieties. The crop also provides feed for livestock in the form of rice straw and husk. It is also used as a raw material in the manufacturing industry.

4. Rice production was at its lowest ebb (4.823 million tonnes) during 2010-11. Since 2010-11, rice production has increased in a fluctuating manner and stood at 7.450 million tonnes in 2017-18. During 2019-20, rice was cultivated on an area of 3034 thousand hectares, 8.0% higher than the last year's area of 2810 thousand hectares. Country production stood at 7410 thousand tonnes against the target of 7431.7 thousand tonnes, showing a shortfall of 0.29% against the target, however, slightly higher than the 2018-19 production by 2.9%. This production turnover happened mainly due to increase in area by 8.0% and yield by 0.75% over the previous year..

5. Policy initiatives are required to sustain rice exports through investment in research, pest eradication, storage, improvement in yield, develop varieties of international demand and GAP (Good Agriculture Practice) certification at farm level. These efforts would help gain new markets around the globe.

6. This report covers different aspects of the paddy including production and exports. Necessary quantitative analysis is conducted on each aspect to draw important implications for making price policy suggestions for the 2020-21 crop.

7. Section-1 'Introduction' is preceded by summary of findings and recommendations. Section-2 gives sowing and transplanting time of rice (paddy) in Pakistan. Performance of the 2019-20 crop is reviewed in Section-3 while Section-4 is on domestic demand, supply and price situation of rice, which is followed by Section-5 presenting cost of production of rice (paddy) for 2020-21 crop. Section-6 of the report is on economics of rice (paddy) and

¹ Economic Survey of Pakistan, 2019-20.

competing crops. Paddy prices in real/ nominal terms are analyzed in Section-7. It covers prices for both basmati and IRRI varieties. Section-8 deals with world supply, demand, stocks, trade and international prices of milled rice. Analysis regarding rice export from Pakistan during 2018-19 is presented in Section-9 of the report. Section-10 is assigned to analyze and describe economic efficiency in rice production in Pakistan. Next section-11 gives rice yield among competing countries. Yield potential of domestic varieties of rice is assessed in Section-12. Section-13 casts on availability of improved seed of rice (paddy) during 2019-20 and the last Section-14 is attributed to acknowledgement of technical input for various sections of API.

2. SOWING AND TRANSPLANTING TIME OF RICE PADDY

8. Rice crop in Pakistan is mostly sown by transplanting of seedlings raised in nurseries. Direct seeding is also practiced but on a limited scale. Sowing time of nurseries and transplanting differ by variety and region. The recommended sowing time of nurseries and their transplanting in various regions are given in **Table-1**.

Table-1: Sowing Times of Rice Crop in Pakistan

Province	Variety	Time for	
		Sowing nursery	Transplanting
Punjab	Super Basmati	20 May to 7 June	20 June to 7 July
	Other Basmati	1 June to 20 June	1 July to 31 July
	IRRI	20 May to 7 June	20 June to 7 July
Sindh			
Upper Sindh	IRRI-6, Sada Hayat	8 May to 15 June	8 June to 15 July
	DR-82/92	23 May to 30 June	23 June to 31 July
	DR-83	16 June to 15 July	16 July to 15 August
Lower Sindh	IRRI-6, Sada Hayat	16 April to 15 May	16 May to 15 June
	DR-82/92	8 May to 22 June	8 June to 22 July
	DR-83	1 June to 7 July	1 July to 8 August
KPK			
Plains	All varieties	1 May to 31 May	1 June to end of June
Hilly areas	All varieties	1 May to 20 May	3 rd week of May to end of June
Balochistan	All varieties	20 May to 30 June	20 June to 30 July

Sources:

- For Punjab: Rice Research Institute, Kala Shah Kaku
- For Sindh: Rice Research Institute, Dokri, Sindh
- For KPK and Balochistan: Rice Coordinator, NARC, Islamabad

3. REVIEW OF 2019-20 CROP

3.1 Provincial Shares in Area and Production of Rice (Paddy)

9. During the period (2017-18 to 2019-20), average annual production of rice worked out at 7.355 million tonnes from average area of 2.915 million hectares (7.203 million acres) (Table-2). Variety-wise break-up of rice production shows that Punjab having best suited agro climatic conditions in production of basmati rice is the sole producer of basmati rice in the country. In total, production of IRRI rice is contributed; Punjab, Sindh, and Balochistan contributed 19.8%, 46.9% and 33.3.3% respectively. In 'Other' varieties category, shares of Punjab, Sindh and KP are 24.9%, 69.5% and 5.5%, respectively.

10. Provincial shares of Punjab, Sindh, KP and Balochistan in area under rice crop are 66.0%, 26.2%, 2.2% and 5.6% respectively. Basmati accounts for 52.0% while IRRI and 'Others' varieties carried 19.7% and 28.3% of the total area.

Table-2: Province Wise Average Share in Area and Production of Rice: 2017-18 to 2019-20 Crops

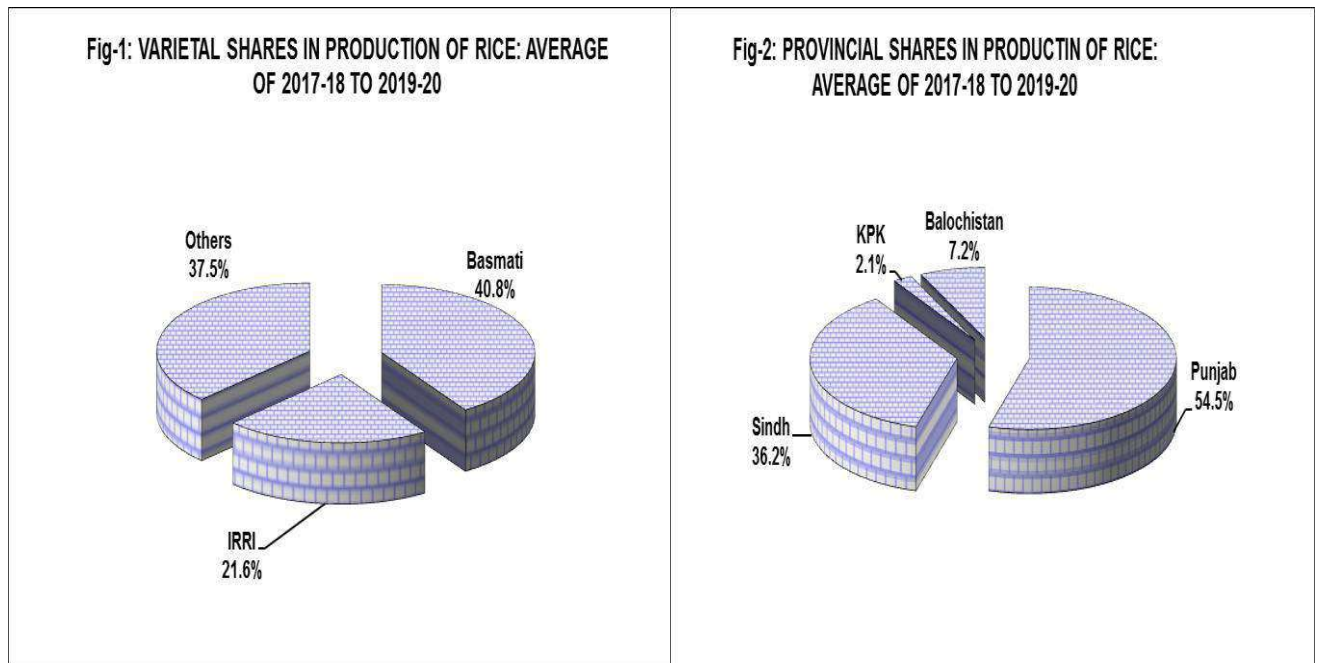
Variety	Pakistan		Punjab	Sindh	KPK	Balochistan
<i>Area (000 hectares)</i>		%	-----%-----			
Total	2915.0 (7203.3)	100.0	66.0	26.2	2.2	5.6
Basmati	1517.1 (3749.0)	52.0	100.0	-	-	-
IRRI	573.6 (1417.7)	19.7	20.9	50.8	-	28.3
Other	824.2 (2036.7)	28.3	34.9	57.4	7.6	-
<i>Production (000 tonnes)</i>		%	-----%-----			
Total	7354.9	100.0	54.5	36.2	2.1	7.2
Basmati	3003.3	40.8	100.0	-	-	-
IRRI	1590.6	21.6	19.8	46.9	-	33.3
Other	2761.1	37.5	24.9	69.5	5.5	-

Note:

- Figures in parenthesis are thousand acres

Source:

- Worked out from data in Annex-I



3.2 Overtime Changes in Area, Yield and Production of Rice

11. Area under rice crop during the period between 2009-10 and 2019-20 ranged between 2.309 and 3.034 million hectares (Annex-I) which in acre units ranged between 5.705 and 7.498 million acres (Annex-1A). During the same period production oscillated between 4.823 and 7.450 million tonnes (Annex-I) while yield during this period fluctuated between 2039 and 2568 kg per hectare. Long and short term changes in area, yield and production of rice are discussed below:

3.3 Long Term Changes (Growth Rates): 2009-10 to 2019-20

12. During the decade ending 2019-20, production of rice at country level is estimated to have increased @ 2.7% per annum as a cumulative effect of increase in yield @ 1.2% and area @ 1.5%. These data are given in Table-3.

- Punjab

13. Annual growth of rice production in Punjab during the period 2009-10 to 2019-20 remained 1.6% as a result of 0.9% per annum increase in yield and 0.7% per annum in area. Production of basmati rice during the same period increased by 3.9% per annum mainly due to 2.4 and 1.5% per annum increase in area and yield respectively. Production of IRRI rice, during the reference period decreased by 4.0% annually, due to 3.5% decrease in area and 0.5% decrease in yield. Production of varieties in 'Other' category increased @ 8.5% per annum mainly due to expansion in area @ 5.3% and 3.0% improvement in yield.

- **Sindh**

14. In Sindh, where only coarse rice varieties are cultivated, rice production during the period under reference is estimated to have increased @ 4.3% annually due to 4.2% growth in area and 0.1% rise in yield.

Table-3: Average Annual Growth Rate of Area, Yield and Production of Rice: 2009-10 to 2019-20

Country/Province	Variety	Area	Yield	Production
		-----Per cent per annum-----		
Pakistan	All varieties	1.5	1.2	2.7
	Basmati	2.4	1.5	3.9
	IRRI	-3.5	-0.5	-4.0
	Others	5.3	3.0	8.5
Punjab	All varieties	0.7	0.9	1.6
	Basmati	2.4	1.5	3.9
	IRRI	-6.4	0.7	-5.8
	Others	-2.2	0.4	-1.9
Sindh	All varieties	4.2	0.1	4.3
	IRRI	-3.8	-3.5	-7.2
	Others	15.0	1.4	16.6
KPK	All varieties	3.3	3.7	7.1
Balochistan	All varieties	1.2	5.8	7.1

Note:

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

- **KPK**

15. In KPK, production of rice during the referred period also increased i.e. 7.1% per annum due to only surge in area and yield @ 1.2 and 5.8% per annum respectively.

- **Baluchistan**

16. In Balochistan, rice production during the period under reference has recorded positive growth rate 7.1% due to also increase in area @ 1.2% and rise in yield @ 5.8% per annum.

3.4 Short Term Changes (Growth Rates): 2018-19 to 2019-20

17. According to the Final estimates, rice production estimated at 7.413 million tonnes in 2019-20 is 2.9% higher than last year production of 7.202 million tonnes (Table-4). The production increased mainly due to increase in area by 8.0% however, yield has decreased by 4.7%. Changes in area, yield and production by province and by variety in 2019-20 in relation to 2018-19 are given in Table-4.

- **Punjab**

18. In Punjab, overall production of rice shows 4.1% increase during 2019-20 as compared with 2018-19. Rise in production occurred mainly due to 6.6% increase in area. Production of basmati increased by 10% due to 12.8% increase in area however, yield decreased by 2.5%. IRRI varieties show decrease of 33.8% due to reduction both in area and yield by 31.8% and 2.9% respectively. Production of 'Other' rice decreased in 2019-20 by 1.7% due to 7.2% decrease in area though 5.9% increase in yield.

- **Sindh**

19. In Sindh, overall production of rice increased slightly in 2019-20 by 0.2% mainly due to area increase of 12.4% however, yield has decreased by 10.8% against the last year. Production of IRRI variety decreased by 21.3% mainly due to 0.6% and 20.8% decrease in area and yield respectively against the last year. Production of 'Other' rice increased in 2019-20 by 9.3% over the previous year. The reason is area expansion by 20.4% but yield decrease by 9.2%.

Table-4: Area, Yield and Production of Rice by Variety: 2018-19 and 2019-20 Crop

Country/ Pakistan	Area		Change	Yield		Change	Production		Change
	2018-19	2019-20		2018-19	2019-20		2018-19	2019-20	
	000 hectares		%	Kgs/hectare		%	000 tonnes		%
Pakistan	2810.0	3034.2	8.0	2563.0	2443.2	-4.7	7201.9	7413.1	2.9
Basmati	1473.0	1662.0	12.8	2002.2	1951.9	-2.5	2949.2	3244.0	10.0
IRRI	549.1	515.6	-6.1	2933.0	2650.5	-9.6	1610.5	1366.6	-15.1
Others	787.9	856.6	8.7	3353.5	3271.5	-2.4	2642.2	2802.5	6.1
Punjab	1904.0	2029.1	6.6	2089.8	2042.1	-2.3	3979.0	4143.7	4.1
Basmati	1473.0	1662.0	12.8	2002.2	1951.9	-2.5	2949.2	3244.0	10.0
IRRI	133.6	91.1	-31.8	2627.2	2552.1	-2.9	351.0	232.5	-33.8
Others	297.4	276.0	-7.2	2282.4	2417.4	5.9	678.8	667.2	-1.7
Sindh	690.2	775.8	12.4	3725.0	3321.0	-10.8	2571.0	2576.5	0.2
IRRI	262.0	260.3	-0.6	2906.1	2301.6	-20.8	761.4	599.1	-21.3
Others	428.2	515.5	20.4	4226.1	3835.7	-9.2	1809.6	1977.4	9.3
KPK	62.3	65.1	4.5	2468.7	2425.5	-1.7	153.8	157.9	2.7
Balochistan	153.5	164.2	7.0	3245.0	3258.2	0.4	498.1	535.0	7.4

Source: Annex-I

- **KPK**

20. In KPK, rice production during 2019-20 increased by 2.7% due to area increase of 4.5% though yield decrease of 1.7% compared with the last year.

- **Baluchistan**

21. In Balochistan, where IRRI variety is grown, production in 2019-20 crop increased by 7.4% mainly due to increase in area by 7.0% and yield increased by 0.4% against the last year.

4 TARGETS VS ACHIEVEMENTS OF 2019-20 CROP

22. Federal Committee on Agriculture (FCA) fixed area target for 2019-20 rice crop at 2.877 million hectares and production target at 7.432 million tonnes in its Meeting of October, 2019 held at Islamabad. So far as 2019-20 crop achievements are concerned, Provincial Agriculture Departments have reported its final estimate of area at 3.034 million hectares is higher than the respective target by 5.5% and production at 7.413 million tonnes which is slightly lower than the respective targets by 0.2% (Table-5).

Table-5: Targets and Estimated Achievements of Area, Yield and Production of Rice: 2019-20 Crop

Country/ Province	Area		Deviation from Target	Yield		Deviation from Target	Production		Deviation from Target
	Target	Achieve- Ment		Target	Achieve- Ment		Target	Achieve- Ment	
	000 hectares		%	kgs per hectare		%	000 tonnes		%
Pakistan	2876.9	3034.2	5.5	2583.2	2443.2	-5.4	7431.7	7413.1	-0.2
Punjab	1869.0	2029.1	8.6	2140.2	2042.1	-4.6	4000.0	4143.7	3.6
Sindh	770.0	775.8	0.8	3519.5	3321.0	-5.6	2710.0	2576.5	-4.9
KPK	62.9	65.1	3.5	2348.4	2425.5	3.3	147.7	157.9	6.9
Balochistan	175.0	164.2	-6.2	3280.0	3258.2	-0.7	574.0	535.0	-6.8

Sources:

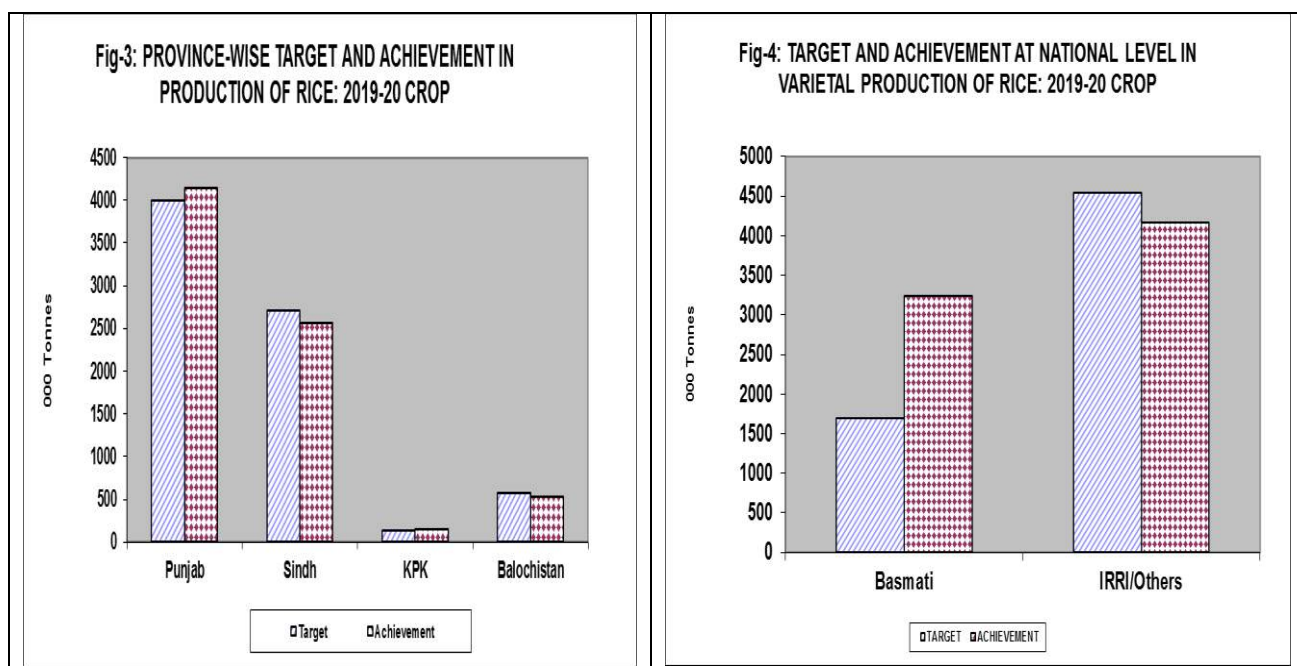
1. For targets: Minutes of the Federal Committee on Agriculture (FCA) Meeting held in October, 2019 in Islamabad
2. For achievements: Derived from Annex-I

23. Area and production targets of the 2019-20 crop by province wise presented in Table-5. In Punjab area target remained exceed by 8.6%, in Sindh by 0.8%, in KPK by 3.5% but in Balochistan area remained short by 6.2%. Productions of Sindh and Balochistan were less than the target by 4.9% and 6.8% respectively. However, Punjab and KPK production exceeded the target by 3.6% and 6.9% respectively. So far as yield targets for 2019-20 rice crop are concerned, these were not achieved except KPK. In Punjab yield declined the target by 4.6%, in Sindh by 5.6% and in Balochistan by 0.7%. In KPK yield target could be achieved and it was high by 3.3%.

5. IMPORTANT RICE PRODUCING DISTRICTS

24. Districts based on 2017-18 to 2019-20 average production (with varietal break-up) are arranged in descending order in Annex-II. Districts producing more than 50 thousand tonnes of rice include Gujranwala, Sheikhpura, Okara, Hafizabad, Sialkot, Nankana Sahib, Bahawalnagar, Pakpattan, Kasur, Jhang, Narowal, M.B. Din, T.T. Singh, D.G. Khan, Chiniot, Vehari, Lahore, Khanewal, Muzaffargarh, Multan, Sahiwal, Gujrat, Sargodha, and Faisalabad from Punjab; Badin, Larkana, Jacobabad, Shikarpur, Kashmore, Qamber, Thatta, Dadu and Tando Muhammad Khan from Sindh and Jafarabad and Nasirabad from Balochistan. These 35 districts collectively produced 95.2% of total production of rice in the country. Main basmati producing districts which contribute about 72.5% of total basmati in the country are Sheikhpura, Hafizabad, Sialkot, Nankana Sahib, Gujranwala, Okara, Jhang, Pakpattan,

Narowal, Bahawalnagar, M.B. Din, and T.T. Singh, While 59.1% of total IRRI rice production is contributed by Okara, Larkana, Thatta, Nasirabad and Jafarabad. These districts are above 100 thousand tonnes producer (Annex-II).



6. DOMESTIC DEMAND, SUPPLY OF RICE AND PRICES OF RICE PADDY

6.1 Domestic Demand and Supply of Rice

25. Based on annual per capita availability of rice averaging at 13.47 kgs during the period 2016-17 to 2018-19 (Annex-III), the domestic consumption requirement in 2019-20 for population of 218.00 million has been estimated at 2937 thousand tonnes. According to second estimate the country has produced 7211 thousand tonnes rice during 2019-20 crop. After deduction of 433 thousand tonnes for the seed and wastage allowance @ 6 per cent of the production, the net available rice for consumption and trade comes to 6778 thousand tonnes, hence Pakistan has an export surplus of 3841 thousand tonnes during 2019-20.

6.2 Domestic Prices of Basmati Rice Paddy

26. During current season 2019-20, the farmers of Basmati paddy have fetch a good price of their produce. The wholesale markets prices of basmati supper paddy in major markets in collar area (area designated/suitable for aromatic basmati rice) has been presented Table-6. The price of basmati super paddy ranged between Rs 1974 per 40 kgs in Hafizabad market during November 2019 and Rs 2475 per 40 kgs in Gujranwala market during December 2019. The season average prices of basmati super (paddy) in the Punjab have ranged between Rs 2037 and Rs 2372 per 40 kgs.

Table-:6 Monthly Average Wholesale Prices of Basmati Super (Paddy) in Major Producer Area Markets of the Punjab: Nov-Dec, 2019-2020 crop

S.No	Markets	Nov	Dec	Average
		-----Rs per 40kgs-----		
1	Chiniot	2151	2134	2143
2	Sargodha	2277	2329	2303
3	Hafizabad	1974	2100	2037
4	Sheikhupura	2236	2425	2331
5	Gujranwala	2269	2475	2372
6	M.B. Din	2276	2433	2355
7	Nankana Sahib	2250	2235	2243
Average		2205	2304	2255

Source: Directorate of Agriculture (E&M) Punjab, Lahore.

6.3 Domestic Prices of Kainat Paddy

27. The data regarding wholesale price of extra-long and pearl white kainat paddy in main producing area markets of Punjab is presented in Table-7. The price of kainat paddy has also followed the prices of basmati paddy. The farmers have received highest prices during the last five years. The price of Kainat paddy ranged between Rs 1948 per 40 kgs in Sheikhupura market during November 2019 and Rs 2261 per 40 kgs in Pakpattan market during January 2020. The season average prices of Kainat (paddy) in the Punjab have ranged between Rs.1980 and Rs.2187 per 40 kgs.

Table-:7 Monthly Average Wholesale Prices of Kainat (Paddy) in Major Producer Area Markets of the Punjab: Nov 2019 to Jan 2020

S.No	Markets	Nov	Dec	Jan	Average
		-----Rs per 40kgs-----			
1	Pakpattan	2204	2097	2261	2187
2	Sargodha	1982	1969	2032	1994
3	Bahawalnagar	2112	2019	2109	2080
4	Hafizabad	1968	1992	-	1980
5	Sheikhupura	2126	2138	-	2132
6	Nankana Sahib	2141	2124	-	2133
7	Vehari	2081	2072	2100	2084
8	Burewala	2122	1983	2125	2077
9	Arifwala	2092	2077	2209	2126
10	Okara	2140	2102	2142	2128
11	R.Y Khan	2100	2107	2100	2102
Average		2097	2097	2026	2135

Source: Directorate of Agriculture (E&M) Punjab, Lahore.

28. The average wholesale market prices of IRRI Paddy in Sindh (Table-8) have ranged between Rs 1105 per 40 kgs in Hyderabad market during November 2019 to Rs 1400 per 40 kgs in Badin and markets during January 2020. The seasonal average during 2019-20 crop ranged between Rs 1135 to Rs 1357 per 40kgs.

Table-:8 Monthly Average Wholesale Prices of IRRI-6 Paddy in Major Producer Area Markets of Sindh during November 2019 to January 2020

S.No	Markets	Nov	Dec	Jan	Average
		-----Rs per 40kgs-----			
1	Badin	1350	1400	1300	1350
2	T.M.Khan	1220	1300	-	1260
3	Hyderabad	1105	1150	1150	1135
4	Thatta	1250	1300	-	1275
5	Dadu	1250	1200	1200	1217
6	Larkano	1350	1300	1280	1310
7	Shikarpur	1350	1300	1250	1300
8	Jacobabad	1200	1110	1175	1162
9	Kashmore	1325	1385	1360	1357
10	Kambar	1150	1230	1300	1227
	Average	1255	1268	1252	1259

Source: Market Committees, Sindh.

7. COST OF PRODUCTION OF RICE PADDY

29. Cost of production (COP) is one of the important factors in making price suggestion for farm commodities. However, its estimation involves a number of conceptual problems and practical difficulties. In this regard wide variations in the inputs use level, technology adoption and diverse farming practices resulting in varying yield levels are worth mentioning.

30. Cost of production estimates for Punjab and Sindh for various varieties groups of rice paddy for the 2020-21 crop have been updated by adapting the input-output parameters as used in the Price Policy Report for Rice Paddy 2019-20 crop in conjunction with the latest prices and rates of different inputs and cultural operations collected from main rice producing districts of Punjab and Sindh provinces. The prices of inputs and custom hiring rates of field operations were updated with the information provided by the participants in the API meeting held at Islamabad and annual field survey conducted by the API teams in the important rice growing areas of Punjab and Sindh during Jan-Feb 2020. COP estimates for rice paddy for the Punjab and Sindh are detailed in Annex-IV to V, while summary of these is shown in Table-8.

7.1 Average farmer expected cost of production of rice paddy for 2020-21 crop against 2019-20

31. Expected cost of production estimates of basmati for Punjab and IRRI for Sindh in 2020-21 and 2019-20 are summarized and presented in the Table-8.

- Punjab

• Basmati Paddy

32. According to analysis presented in the above referred table, net cost of growing one acre of basmati paddy at the current inputs prices and hiring rates of different cultural operations prevailing in Punjab during 2020-21 crop year is anticipated at Rs 57618 inclusive land rent. Based on the average yield of 1363 kg per acre, farm level cost of production

works out to Rs 1691 per 40 kg. Adding marketing cost @ Rs 55 per 40 kg, cost of production till harvest and disposal in the market or at the Sheller would be Rs 1746 per 40 kg - more by Rs 62 per 40 kgs than the last year corresponding cost estimated at 1683 per 40 kg.

- **Sindh**

* **IRRI Paddy**

33. In Sindh, net cost of cultivation for one acre of IRRI/ hybrid paddy during 2020-21 crop year is expected to cost Rs 46343 inclusive land rent. Based on 2018-19 average yield of 2000 kg per acre – as reported by the farmers during the API field survey, cost of production at farm level would be Rs 927 per 40 kg. Including marketing expenses @ Rs 55 per 40 kg, the cost of production to deliver at Sheller/ market would be Rs 982 per 40 kgs, against Rs 945/ 40 kg in 2019-20 - more by Rs 37 per 40 kgs.

34. Main factors behind these changes are increased in diesel price during 2020, increased in fertilizer prices i.e DAP from Rs 3600 to Rs 4100 and labour cost from Rs 500 to Rs 525 per day.

Table-9: Average Farmers' Cost of Production of Rice Paddy: 2019-20 and 2020-21 Crops

Item	Unit	Cost estimate		Change in 2020-21 over 2019-20 [3]=[2]-[1]
		2019-20 crop [1]	2020-21 crop [2]	
Punjab (Basmati)				
1. Net cost of cultivation including land rent	Rs/acre	55658	57618	1959
2. Yield	Kgs/acre	1363	1363	0
3. Cost of production at farm gate	Rs/40 kgs	1633	1691	57
4. Marketing cost i.e. loading, transport, Commission	“	50	55	5
5. Cost of production at market level	“	1683	1746	62
Sindh (IRRI)				
1. Net cost of cultivation including land rent	Rs/acre	44750	46343	1593
2. Yield	Kgs/acre	2000	2000	0
3. Cost of production at farm gate	Rs/40 kgs	895	927	32
4. Marketing cost i.e. loading, transport, commission etc.	“	50	55	5
5. Cost of production at market level	“	945	982	37

Source: Annex-V to VII

Notes: Figures in last column may show slight difference due to rounding of decimals in column [1] and column [2].

7.2 Cost of Major Operations/Inputs

35. Break-up of costs of various field operations and farm inputs in the gross cost of cultivation of rice paddy in Punjab and Sindh during 2019-20 and expected in 2020-21 (with respective changes) over the previous year are presented in Table-10.

- **Punjab**

Basmati

36. In Table-10 cost of production of paddy is consolidated under broader headings rather than individual items. Analysis is presented for Punjab and Sindh provinces for basmati and IRRI varieties. The data comprise major operations/ inputs of cost of production of paddy. It helps us identify where policy support can be more beneficial to paddy growers.

37. Figures in parenthesis in Table-10 show respective percentages. It may be seen from the data that major component of the cost of basmati paddy production is land rent (23%). Next higher item is irrigation expenditure (19%) followed by fertilizer inclusive farm yard manure (FMY) (16%). Expenditure on irrigation mainly comes from tube well water which supplements the canal water. Fertilizer carries 16% of the gross cost and thus is a crucial item in the cost of production estimate. All other cost items carry lesser weight in the gross cost of production of paddy.

- **Sindh**

IRRI

38. For IRRI paddy grown in Sindh, again land rent is the major cost component (30%), followed by fertilizer inclusive farm yard manure (farm yard manure) (17%), Nursery/uprooting and transplanting (15%) and land preparation (13%). It needs to be noted that in all of the three categories land rent, land preparation and fertilizer emerges as major components of the cost of production of paddy. Thus these may be suggested for giving subsidy etc for minimizing cost of production of this crop.

39. Last column of the above referred Table indicates overtime increase or decrease in the cost of production of basmati and IRRI varieties against the last year. The data identify potential inputs and cultural operations whose cost may be reduced by providing subsidy to minimize cost of production of paddy. It may be assessed from the data that irrigation expenditure, land preparation costs and fertilizer cost may be reduced by subsidizing electricity for agricultural tube wells, removing GST on fertilizer and reducing price of diesel.

40. Resource allocation among competing enterprises is primarily guided by economic considerations as reflected in their gross cost, gross income, gross margin, net income, output-input ratio, etc. Rice, a major 'kharif' crop, competes with cotton for land, water and other farm resources in the areas where cultivation of both crops is technically feasible. The coarse and fine varieties of rice may also compete among themselves. Rice also faces indirect competition from sugarcane, an annual crop, which occupies the land over the year.

41. The economics of rice and competing crops has been analyzed in terms of input-output prices paid and received by the growers for the 2019-20 crops. A summary of the relevant economic indicators emerging from the analysis is presented in Table- for the Punjab and Table- for Sindh. Also, the Output-Input ratios have been graphically presented in Fig-5 and Fig-6 for both the provinces. Details of the analysis are provided in Annex-VII.

Table-10: Cost of major operations/inputs of rice paddy: 2019-20 and 2020-21 crops

Operations/inputs	2019-20	2020-21	Change in 2020-21 over 2019-20
	Crop	Crop	
(Rs/acre)			
Punjab (Basmati)			
1. Land preparation	8640(14)	8789(14)	149
2. Nursery, uprooting and transplanting	6000(10)	6800(11)	800
3. Weeding	1244(2)	1323(2)	79
4. Plant protection	1000(2)	1250(2)	250
5. Irrigation	11896(19)	12451(19)	555
6. Fertilizer including FYM	9938(16)	10085(16)	-533
7. Land rent	15000(24)	15000(23)	
8. Harvesting and threshing etc	2816(5)	3000(5)	184
9. Others	5125(8)	5321(8)	147
10. Gross cost	61658(100)	64018(100)	1631
Sindh (IRRI)			
1. Land preparation	5850(12)	6500(13)	650
2. Nursery/uprooting and transplanting	6700(14)	7300(15)	600
3. Weeding	1200(2)	1260(3)	60
4. Plant protection	944(2)	979(2)	35
5. Irrigation	3346(7)	3520(7)	175
6. Fertilizer including FYM	8611(18)	8778(17)	242
7. Land rent	15000(31)	15000(30)	
8. Harvesting and threshing etc	2000(4)	2250(4)	250
9. Others	4800(10)	4756(9)	-39
10. Gross cost	48450(100)	50343(100)	1972

Notes: Others' include cost of bund making, mark-up, management, land tax, land revenue and drainage cess.

- Figures in parenthesis are percent shares in total cost of cultivation.
- Rounding off figures may result in slight differences

8. ECONOMICS OF RICE PADDY AND COMPETING CROPS

- Punjab

42. Basmati's performance in Punjab in terms of returns to overall investment has been slightly lower than seed cotton. Similarly, in terms of purchased inputs and irrigation water, Basmati's returns to farmer for the farm investment were much lower than the cotton. However, in terms of crop duration Basmati has performed better than seed cotton.

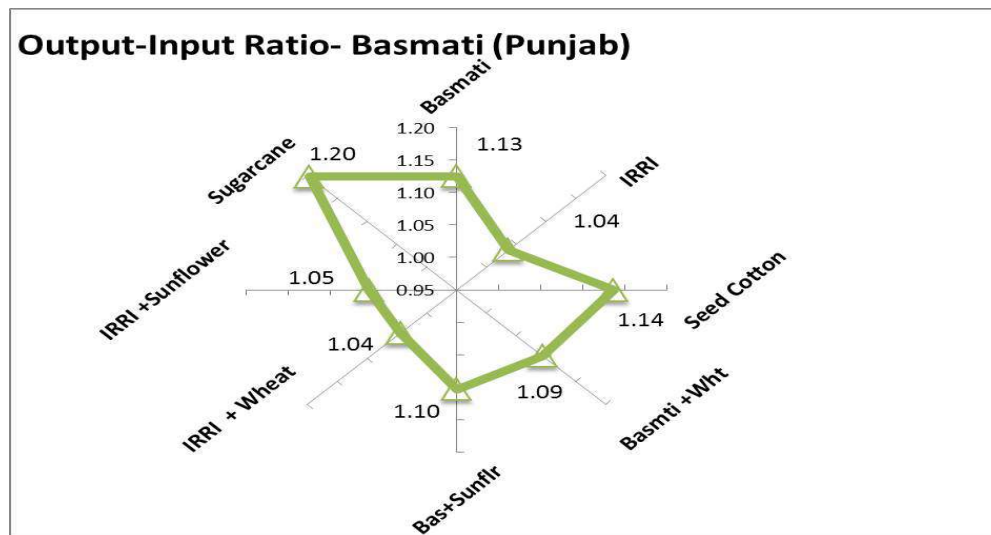
43. IRRI paddy in Punjab also could not perform against seed cotton in any of the economic indicators analyzed and cotton out-competed the earlier comprehensively, except crop duration. Not only that both Basmati and IRRI paddy were out performed by seed cotton, the IRRI even hardly could gain break-even point and its returns to overall investment i.e output-input ratio, were slightly above than 1, which indicates that farmer's costs have slightly met in cultivating IRRI paddy.

Table-11: Economics of Rice and Competing Crops at Prices Realized by the Growers in the Punjab: 2019-20 Crops

Crop/crop combination	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of crop duration	acre-inch of irrigation water used
		----- Rupees -----		
1. Basmati paddy	1.13	2.28	393	1220
2. IRRI paddy	1.04	2.32	373	1084
3. Seed Cotton	1.14	3.40	346	3777
4. Basmati+wheat	1.09	2.67	338	1738
5. Basmati+sunflower	1.10	2.55	351	1579
6. IRRI+wheat	1.04	2.71	328	1596
7. IRRI+sunflower	1.05	2.58	341	1461
8. Sugarcane	1.20	3.51	353	2898

Source: Annex-VII.

44. In case of indirect competition, the Basmati combinations with Wheat and Sunflower though show better returns however still lag far behind sugarcane in terms of output-input ratio. Sugarcane, based on the market price received by the farmers, has performed much



better against the earlier in terms of all the indicators including purchased inputs and irrigation water.. IRRI combinations remained considerably

Fig-5: Output-input Ratio in Punjab for Basmati Paddy

lower in respect of all the economic indicators analyzed. However, the IRRI combination with Wheat gained a marginal edge over Sunflower combinations in terms of returns to purchased inputs.

- **Sindh**

45. In Sindh, IRRI paddy farming has shown slightly better results in terms of returns to overall investment against seed cotton. However, in the rest of the economic criteria remained below.

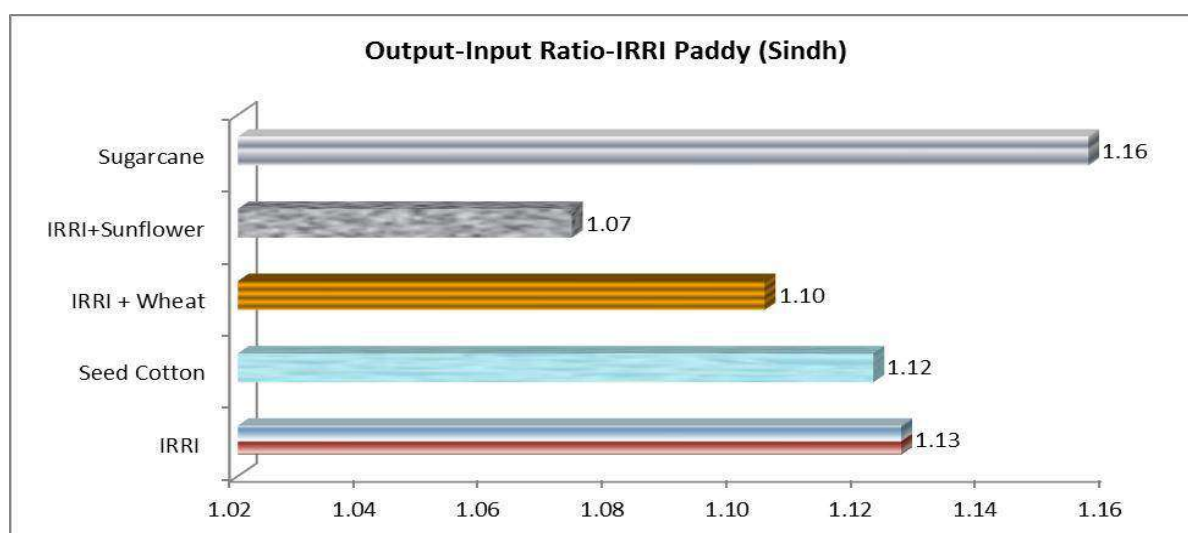


Fig-6: Output-input Ratio in Sindh for IRRI Paddy

Table-12: Economics of IRRI Paddy and Competing Crops at Prices Realized by the Growers in Sindh: 2019-20 Crops

Crop/crop combination	Output-input ratio	Gross revenue per		
		rupee of purchased inputs cost	day of crop duration	acre-inch of irrigation water used
----- Rupees -----				
1. IRRI paddy	1.13	3.20	333	1071
2. Seed Cotton	1.12	3.31	378	5042
3. IRRI+wheat	1.10	3.29	314	1664
4. IRRI+sunflower	1.07	3.01	274	1266
5. Sugarcane	1.16	3.430.	261	1792

Source: Annex-VII.

46. In context of indirect competition with sugarcane, the economic position of IRRI+wheat rotation is healthier than sugarcane in terms of returns to crop duration. However, the performance of IRRI + sunflower combination has been considerably lower to the sugarcane in terms of overall investment and the remaining indicators accept crop duration. An identical situation of this combination is depicted against the IRRI+Wheat combination, lagging behind all the economic criteria analyzed.

9. NOMINAL AND REAL MARKET PRICES OF BASMATI AND IRRI PADDY: 2015-16 to 2019-20

47. To analyze the overtime changes in the purchasing power of basmati (Punjab) and IRRI paddy (Sindh), the nominal and real market prices of rice paddy for the period 2015-16 to 2019-20 crops were deflated by the Consumer Price Index (CPI), the most common measures of inflation in the economy. The results are given in Table-13 and also depicted in Figs-7 and 8.

Table-13: Nominal and Real Market Prices of Basmati and IRRI-6 Paddy: 2015-16 to 2019-20

Crop year	Nominal Market Prices		Consumer Price Index (CPI)	Real Market Prices	
	Basmati (Punjab)	IRRI-6 (Sindh)		Basmati	IRRI-6
1	2	3	4	5=(2/4)*100	6=(3/4)*100
	Rs per 40 kgs		2015-16=100	Rs per 40 kgs	
2015-16	1320	713	100.00	1320	713
2016-17	1557	832	104.81	1485	793
2017-18	1604	898	109.72	1462	818
2018-19	1834	1121	116.35	1576	963
2019-20	2268	1225	130.33	1740	940

Note: The market prices are the average wholesale prices prevailed during the post-harvest season in the main producer area markets of the Punjab for basmati and of Sindh for IRRI paddy.

Sources: i) Economic Survey of Pakistan, 2019-20.
ii) CPI 2007-08 base year series converted into base year 2015-16.
iii) Directorate of Agriculture, (E&M), Lahore, Punjab.
iv) Directorate of Agriculture Farms and Major Crops Development, Hyderabad, Sindh.

48. It is important to note from the above analysis that due to increasing trend of general inflation in the economy, the gap between nominal and real prices, both of Basmati and IRRI paddy is widening every year. It shows the deterioration of the purchasing power of the commodity overtime in real terms. Variety-wise detail of basmati and IRRI paddy is discussed in the following paragraphs.

9.1 Basmati Paddy (Punjab)

49. The data in Table-13 reveals that the nominal market price of Basmati paddy has evidenced 72 per cent overall increase against the base year during the period under review while its real value improved by only 32 per cent. The major reason for this slow increasing trend in the real purchasing power of the crop is the 30.33 per cent general inflation observed in the economy during the same period.

50. For the entire period under review, the real market price remained above the base year level consecutively up to now. The nominal market prices likely much higher in 2019-20 at the rate 24 per cent as compared to the last year. The year 2019-20 was relatively both for the rice growers as they did fetch highest real prices of Rs 1740 per 40 kgs.

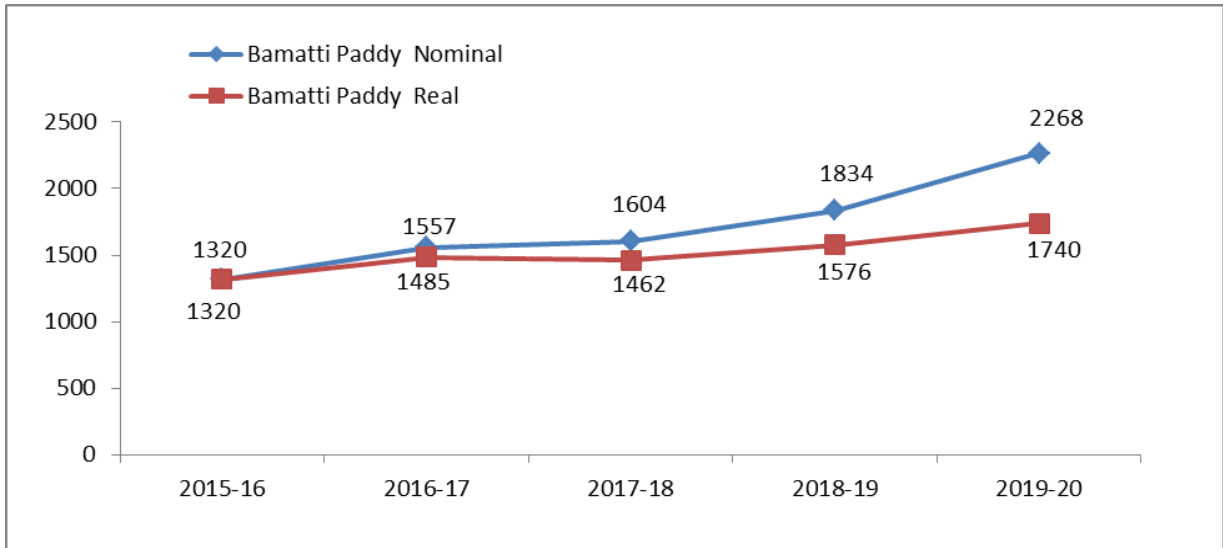


Fig-7: Nominal and Real Market price of Basmati Paddy in the Punjab: 2015-16 to 2019-20

9.2 IRRI Paddy (Sindh)

51. It may be seen from Table-12, that the nominal market price of IRRI paddy in Sindh averaging at Rs 713/- per 40 kgs during the post-harvest season of 2015-16 has increased to Rs 1225/- per 40 kgs in 2019-20, indicating overall increase of 72 per cent. For the rise in CPI by 30.33 per cent, the consequent increase in the real market price of IRRI paddy is estimated at 32 per cent from Rs 713/- in base year to Rs 940/- per 40 kgs in 2019-20.

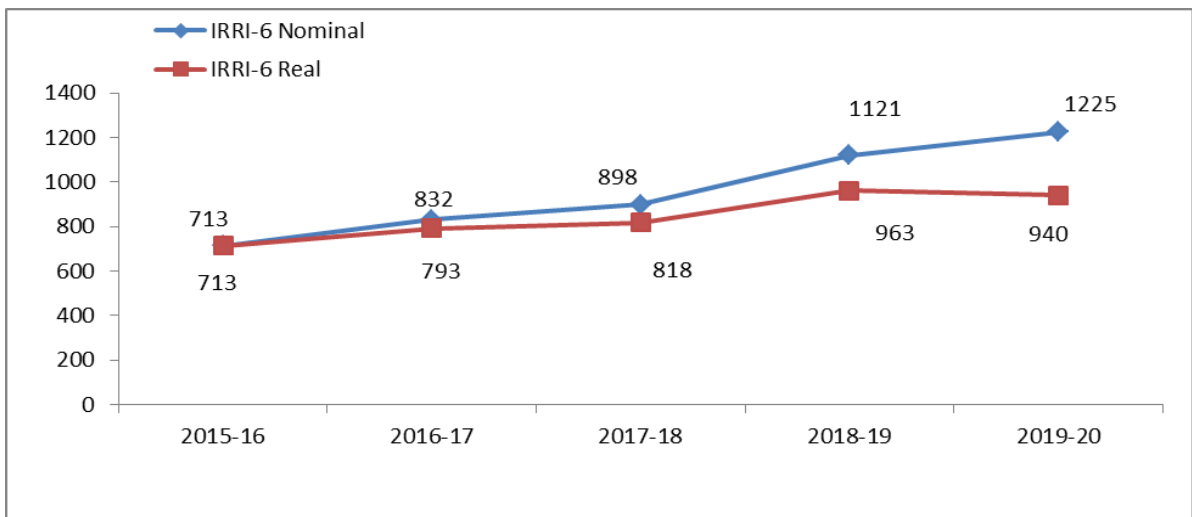


Fig-8: Nominal and Real Market price of IRRI-6 Paddy in the Sindh: 2015-16 to 2019-20

52. The data also reveal that during the whole period in question, the real market prices of IRRI paddy remained above the base year level of Rs.713/- per 40 kg. However, during, 2019-20, the real IRRI prices slightly decrease over last year by 2.38 per cent. The real value of the crop remained higher to base year level throughout the period under review.

10. WORLD SUPPLY, DEMAND, STOCKS, TRADE AND PRICES SITUATION OF MILLED RICE

10.1 World Supply, Demand, Stocks, and Trade

53. The estimated and projected statistics of production, consumption, stocks and trade of rice from 2018-19 to 2020-21 is presented in Table-14.

54. The world production of rice in 2019-20 is estimated at 497 million tonnes, only 1 million less than year 2018-19, accounting for the opening stocks of 175 million tonnes, total supply works out at 672 million tons, 9 million tonnes higher than previous year due to higher opening stocks.

55. Rice production in 2020-21 is projected to slightly increase to 505 million tonnes, 8 million tonnes higher than in 2019-20 forecast. With the addition of opening stocks of 177 million tonnes, total supply would be at 682 million tonnes, a significant increase of 10 million tonnes during 2020-21. The global consumption is projected to increase from 495 million tonnes in 2019-20 to 500 million tonnes in 2020-21. Resultantly, the end year stocks are projected to increase further from 177 million tonnes to 181 million tonnes during 2020-21. The global trade in rice reported at 42 million tonnes in 2019-20 is projected to slightly increase to 45 million tonnes in 2020-21.

Table-14: World Supply, Demand, Stocks and Trade in Rice: 2018-19 to 2020-21

S.No	Item	2018-19	2019-20 Estimated	2020-21 Projected
		-----Million tones-----		
1.	Opening stocks	165	175	177
2.	Production	498	497	505
3.	Total supply (Items 1+2)	663	672	682
4.	Consumption/disappearance	487	495	500
5.	Closing stocks	175	177	181
6.	Trade	43	42	45

Source: International Grains Council, August 2020.

11. RICE EXPORT FROM PAKISTAN

56. Pakistan is one of the largest exporters of rice with an average of 10.24 per cent share in global rice market during 2019-20. During 2017-18 to 2018-19, Pakistan has fetch 2.9 per cent price of rice from international market and received US\$ 17.30 million as compared to last year's value of US \$ 1780 million during the same period, this decrease in price is mainly due to course rice 39.38 per cent inspite of 8.94 per cent increase in basmati rice. However the huge decrease in course has offset the increase of fine variety. Region wise export of rice during 2017-18 and 2018-19 are given in Table-15.

57. The region-wise statistics revealed bulk of the basmati rice export were destined to Asian countries (50 per cent) followed by American countries (40.16 per cent), African countries by (31.49 per cent) Oceania (22.88 per cent) and CIS countries (14.90 per cent) respectively. While basmati rice during 2017-18 over 2018-19 has decreased in Europe (17.0 per cent).

**Table-15 PER CENT CHANGE IN EXPORT OF BASMATI AND COARSE RICE
2017-18 OVER 2018-19**

Region	Basmati Rice	Coarse Rice	Basmati Rice	Coarse Rice	Basmati Rice		Coarse Rice	
	Quantity..		Value		2017-18	2018-19	2017-18	2018-19
	----- Per cent Change -----							
Asia	50.84	16.85	40.39	9.44	39.09	50.15	35.19	44.53
Oceania	22.88	-43.92	7.27	-60.51	2.57	2.69	0.09	0.06
Europe	-17.00	45.57	-21.89	104.77	42.88	30.27	0.96	1.52
Africa	31.49	-17.68	24.72	-17.57	5.33	5.96	53.79	47.95
America	40.16	-18.51	15.12	-15.28	4.78	5.70	3.49	3.08
CIS	14.90	-59.08	2.57	-60.23	5.35	5.23	6.47	2.87
Total	17.56	-7.65	8.94	-39.38	100.00	100.00	100.00	100.00

Source: Annex-X

58. As far as coarse rice is concerned, overall export of coarse rice has decreased by 7.65. The decreased observed in Oceania, CIS, Africa America, and CIS countries by 43.92, 17.68, 18.51, and 59.08 per cent respectively. However the increased perceived in Asian countries by 16.85 per cent, the second largest importer during period under review and in Europe by 45.57 per cent

12. EXPORT PARITY PRICES OF RICE (PADDY)

59. To ascertain export competitiveness of Pakistani rice in the international market export parity prices have been calculated on the basis of actual export prices of both fine and coarse rice. The details of these calculations are given in Annexes—VII to IX, a summary is given in Table-16.

Table-16: Export Parity Prices of Basmati and IRRI Paddy

Items	June 2020	2019-20	Average 2018-2020
A) Export Parity Price Of Basmati Paddy			
i) Average fob Karachi prices (US\$/ton)	847.95	888.32	970.11
ii) Exchange Rate (Rs/US\$)	167.39	167.39	167.39
iii) Average fob Karachi prices (Rs/40Kgs)	5678	5948	6495
iv) Mill-gate price of 40 Kgs paddy	2771	2909	3188
B) Export Parity Price Of IRRI Paddy			
i) Average fob (Karachi) prices (US\$/ton)	450.12	422.69	419.56
ii) Exchange Rate (Rs/US\$)	167.39	167.39	167.39
iv) Average fob Karachi prices (Rs/40Kgs)	3014	2830	2809
iv) Mill-gate price of 40 Kgs paddy	1780	1667	1654

Source: Annexes-VII to IX.

13. ECONOMIC EFFICIENCY IN RICE PRODUCTION

60. Economic efficiency in rice production has been evaluated by estimating most frequently used economic parameters i.e Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC) and Domestic Resource Cost Coefficient (DRC). To assess the impact of price policy changes on rice producers and Pakistan's comparative advantage in rice production, the analysis is conducted from 2015-16 till 2019-20. NPC, EPC and DRC estimates are produced in Table-17 and background analyses given in Annex-XI to Annex-XII.

13.1 Nominal Protection Coefficient (NPC) under Export Situation

61. NPC is a measure of protection or taxation to the producers of a crop in lieu of open market price of the crop. In this calculation open market price is numerator while social price is denominator. By definition, social price is the export parity price minus marketing cost incurred in shifting the commodity from farm gate to the market.

62. NPC, EPC and DRC coefficients are separately calculated for Basmati and IRRI varieties of rice and produced in Table-17.

63. It is observed from the data given in Table-16 that for Basmati grown in Punjab, NPC values have been drastically fluctuating during the reference period. It indicates unstable domestic and international prices of basmati paddy.

Table-17: Economic Efficiency Coefficients for Rice in Pakistan under Export Situation

Province/ Year	NPC	EPC	DRC	US \$ 1= Pak Rs	Domestic Resources Spent (Rs) to earn Forex worth US\$ 1
Punjab					
Basmati					
2015-16	0.42	0.30	0.81	104.24	84.69
2016-17	0.59	0.52	0.52	104.68	54.30
2017-18	0.54	0.50	0.34	109.84	37.42
2018-19	0.65	0.59	0.40	156.30	63.26
2019-20	0.79	0.74	0.46	167.39	77.67
Sindh					
IRRI					
2015-16	1.30	1.49	1.54	104.24	160.69
2016-17	1.64	1.91	1.25	104.68	130.48
2017-18	1.21	1.25	0.75	109.84	81.94
2018-19	0.76	0.71	0.43	156.30	67.00
2019-20	0.79	0.74	0.46	167.39	77.67

Source: Annex-XI and XII.

64. The decisive rule is that if NPC is smaller than one, local producers get price less than the corresponding export parity price and thus are implicitly taxed and vice versa.

65. For IRRI paddy grown in Sindh NPC coefficients have been continuously above one during the period under study except in 2018-19 and 2019-20. It means that on the whole, IRRI paddy growers are protected through the output price policy which induces producers for promoting the crop.

13.2 Effective Protection Coefficient (EPC) under Export Situation

66. Effective Protection Coefficient unlike NPC includes both input and output prices in its calculation. Thus it captures cumulative effect of both input costs and price of the crop on respective growers. In EPC calculation, difference of the crop revenue and traded inputs cost at private price is numerator and difference of the crop revenue and traded inputs cost at social price is denominator. However, it needs to be mentioned that EPC does not consider all input costs rather considers only traded inputs costs – those inputs which are purchased with cash. These are seed, fertilizer, tube well water, machinery (tractor etc). As a general principle if EPC is greater than one, producers of the crop are protected and if it is less than one they are implicitly taxed. In the former situation farmers are induced to produce more while in the later situation development of the crop is discouraged.

67. It is understood from EPC values for Basmati paddy produced in Table-17 that produce prices of basmati have not been consistent with input prices in Pakistan. These have been highly fluctuating during the reference period. EPC values mentioned in the referred table indicate that basmati growers in Punjab remained implicitly taxed because EPCs were less than one during last five years.

68. EPC values for IRRI paddy in Sindh mentioned in the referred table indicate that IRRI growers in Sindh remained implicitly taxed because EPCs were less than one during last three years.

69. The above analysis implies that input output pricing policy in Pakistan favours IRRI growers more than the basmati growers which may increase its production in future.

13.3 Domestic Resource Cost Coefficient (DRC)

10 Basmati paddy

70. Domestic Resource Cost Coefficient (DRC) is a measure of opportunity cost of domestic resources used per unit of the value added in production of a crop. DRC value less than one indicates a country's comparative advantage in a particular commodity and the vice versa. In this calculation numerator is the total non-traded inputs expenditure at social prices and denominator is difference of the crop revenue and the traded inputs cost at social prices. As a principle, if DRC coefficient is greater than one, country does not have comparative advantage in the concerned crop and if it is less than one, it has comparative

advantage in that crop. In other words, the crop is efficiently produced in that particular country and cost of resources employed in its production is less than its import cost.

71. DRC values for Basmati and IRRI are also produced in **Table-17**. It is observed from the data in this Table that DRC coefficient for basmati paddy in Punjab and IRRI in Sindh (2015-16 and 2016-17 exception for Sindh) has been always less than one during the analysis period which indicates Pakistan's comparative advantage for Basmati in Punjab and for IRRI in Sindh.

13.4 Cost of Earning Foreign Exchange

72. It is already mentioned that DRC coefficient is a measure of the opportunity cost of the domestic resources (family labour, interest on capital, management charges, canal water charges, etc) used in production of a crop. Thus DRC coefficient may be used to determine cost of foreign exchange earning in terms of domestic resources. The foreign exchange earning cost estimates are derived from the analysis produced in Table-17.

73. It is observed from column 6 in the referred table that we spend less to earn forex through Basmati than IRRI because cost of domestic resources to earn one dollar are consistently less in Basmati than IRRI. Furthermore, these costs are relatively more stable and consistent in Basmati than IRRI paddy.

14. RICE YIELD AMONG COMPETING COUNTRIES

74. Globally by rice crop during **2019** occupied an area of 167.133 million hectares with total production of 521.33 million tonnes. The world top 27 producing countries contribute 95.11% of total area and 96.14% of total production (Annex-XIII).

75. In terms of rice **area**, India is on the top with 44.500 million hectares followed by China with 30.189 million and Indonesia with 15.995 million hectares. Pakistan lies at 11th number in this regard.

76. In terms of rice **production**, China is on the top with 141.419 million tonnes followed by India with 115.053 million and Indonesia with 55.358 million tonnes. And, Pakistan lies at 10th position in rice production of the world.

77. In terms of **yield** per hectare, Australia lies at the top with 6924 kgs per hectare followed by Egypt with 5884 and USA with 5747 kgs per hectare. It is very amazing situation that **Pakistan** ranks at 57th in terms of yield while **India** falls at 56th position (Annex-XIV). It implies that there is a lot of potential to raise rice productivity per hectare in Pakistan.

15. MAJOR RICE VARIETIES WITH YIELD POTENTIAL IN PAKISTAN

78. In Pakistan, rice is an important food and cash crop. It is the 2nd most important source of cash for the paddy growers. It also earns billion of rupees through its export. The

yield potential of rice of different varieties sown in Punjab and Sindh are presented in Table-18.

79. Pakistan is a major rice exporting country in the World. However, the national yield at the farm level is low despite that tremendous potential exists there. According to the Provincial Agriculture Departments, based on last three years (2017-18 to 2019-20) average yield of rice paddy of different varieties of Punjab and Sindh, is 802 kgs per acre for Basmati, 1061 kgs for IRRI and 969 kgs for “others; in the Punjab. In Sindh, average yield level of IRRI paddy is 1039 kgs per acre and 1646 kgs for other varieties. These yields are much below than the available potential. To meet the ever growing domestic food and export requirements for foreign exchanges, there is a need to make solid efforts to achieve the available yield potential. Yield potential of important rice varieties is presented in Table-18.

Table-18: Major Rice Varieties with Yield Potential

Variety	Yield Potential of Rice Paddy		Share in the total area of rice paddy
	(Maund/acre)	(Kg/acre)	(%)
Punjab			
a) Basmati			
Basmati-385	55	2600	6.05
Super Basmati	65	2600	70.72
b) IRRI			
IRRI-6	80	3200	4.86
Niab- IRRI-9	80	3000	1.95
KS-282	100	3200	2.28
Sindh			
a) IRRI-8			
IRRI-8	80	3200	80
IRRI-6	70	2800	
DR-82	70	2800	
DR-83	50-55	2100	
IRRI-92	70	2800	
Khanewal 95	50-55	2100	
Sada Hayat	60-65	2500	
Shaheen	80	3200	
Lateefy (Aromatic)	40	1600	
b) In Pipe Line			
DR-57	80	3200	
DR-58	85	3400	
DR-65 (Aromatic)	40-45	1700	

Sources:

- Nuclear Institute for Agriculture & Biology (NIAB), Faisalabad
- Rice Research Institute (RRI), Dokri Sindh

16. IMPROVED SEED AVAILABILITY OF RICE PADDY

80. Seed is deemed as a nucleus of plant and plays a vital role in increasing the yield, thus it is necessary to use quality seed of the recommended varieties. In a self-pollinated crop like rice, experts recommend that at least 20% area of rice should be brought under fresh certified seed every year.

81. In order to review the overtime progress regarding coverage of quality seed, the annual gross and replacement of certified seed of rice and its availability during the period from 2014-15 to 2019-20 is presented in Annex-XVI.

82. It may be seen in Annex-XVI that supply of certified seed shows an irregular trend. Availability of certified seed at the country level during the referred period augmented and remained approximately 44.226 thousand tonnes in 2019-20 less by 32.56% than the available certified seed (65.578 thousand tonnes) during 2018-19.

83. Varietal breakup of the supply of certified seed of rice both in public and private sectors for the crop year 2019-20 is presented in the Table-19.

Table-19: Variety wise Certified Seed of Paddy Supplied by Public and Private Sectors for 2019-20 Crop

Province/variety	Seed availability			Area sown	Seed requirement	Seed enough for area
	Public sector	Pvt. Sector	Total			
	(Tonne)			000 hac.	(Tonne)	
Punjab	2161.0	38805.4	40966.4	2029.1	29121.5	140.7
Basmati (Fine)	1253.8	17118.9	18372.7	1662.0	19944.0	92.1
IRRI & others	907.2	21686.5	22593.7	367.1	9177.5	246.2
Sindh (IRRI+others)	177.5	2177.5	2355.0	775.8	19395.8	12.1
KPK (IRRI + other)	200.0	495.0	695.0	65.1	1627.5	42.7
Balochistan (IRRI)	0.0	210.0	210.0	164.2	4105.0	5.1
All Pakistan						
Basmati	1253.8	17118.9	18372.7	1662.0	19944.0	92.1
IRRI +other	1284.7	24569.0	25853.7	1372.2	34305.8	75.4
Total	2538.5	41687.9	44226.4	3034.2	54249.8	81.5

Source:

- FSC&RD, Islamabad

84. Provincial variety-wise data presented in the above Table show that in all provinces, the major source of supply of certified seed was private sector. Share of the private sector in total seed availability is: Punjab (95%), Sindh (92%), Khyber Pakhtunkhwa (71%), Balochistan 100% and at country level 94%. Thus concluded that certified seed of paddy was available to meet 81.52% of the total requirement in the country. The supply of certified seed needs to be increased to ensure paddy growers' access to certified seed.

II. ACKNOWLEDGEMENT

85. In preparing this Report, following officers and officials have put a lot of effort and hard work which is appreciated.

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1	Hussain Ali Turi	Deputy Chief
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**AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE:
2009-10 TO 2019-20**

Year	PUNJAB				SINDH			KP Total (Others)	Baloch Total (IRRI)	Pakistan			
	Basmati	IRRI	Others	Total	IRRI	Others	Total			Basmati	IRRI	Others	Total

AREA

----- Thousand hectares -----

2009-10	1414.0	218.9	298.6	1931.5	518.9	188.8	707.7	53.8	190.1	1414.0	927.9	541.2	2883.1
2010-11	1333.8	182.5	250.5	1766.8	274.7	86.5	361.2	46.1	191.2	1333.8	648.4	383.1	2365.3
2011-12	1121.0	183.3	409.9	1714.2	405.3	230.5	635.8	50.1	171.1	1121.0	759.7	690.5	2571.2
2012-13	995.1	210.0	506.3	1711.4	331.6	179.5	511.1	48.8	37.5	995.1	579.1	734.6	2308.8
2013-14	1192.6	189.4	426.9	1808.9	426.8	318.7	745.5	55.3	179.5	1192.6	795.7	800.9	2789.2
2014-15	1320.0	196.7	361.0	1877.7	423.4	358.1	781.5	56.9	174.3	1320.0	794.4	776.0	2890.4
2015-16	1254.1	183.3	342.8	1780.2	357.1	362.7	719.8	64.7	174.8	1254.1	715.2	770.2	2739.5
2016-17	1352.8	145.3	238.4	1736.5	333.4	417.1	750.5	67.0	170.0	1352.8	648.7	722.5	2724.0
2017-18	1416.4	134.8	289.7	1840.9	351.6	476.7	828.3	61.6	169.8	1416.4	656.2	828.0	2900.6
2018-19	1473.0	133.6	297.4	1904.0	262.0	428.2	690.2	62.3	153.5	1473.0	549.1	787.9	2810.0
2019-20	1662.0	91.1	276.0	2029.1	260.3	515.5	775.8	65.1	164.2	1662.0	515.6	856.6	3034.2

YIELD

----- kgs per hectare -----

2009-10	1751	2431	2362	1922	3331	3677	3423	1903	3393	1751	3131	2775	2387
2010-11	1773	2443	2287	1915	3347	3594	3406	1701	683	1773	2307	2512	2039
2011-12	1685	2491	2272	1912	3570	3528	3555	1890	3089	1685	3202	2663	2396
2012-13	1767	2607	2316	2032	3471	3860	3608	1922	3205	1767	3140	2667	2398
2013-14	1725	2625	2171	1924	3013	4177	3511	2024	3275	1725	2980	2959	2437
2014-15	1771	2559	2237	1943	2743	4164	3394	2302	3277	1771	2815	3131	2423
2015-16	1817	2514	2223	1967	2925	4214	3574	2377	3276	1817	2906	3173	2483
2016-17	1866	2696	2344	2001	2789	4152	3546	2361	3262	1866	2892	3389	2514
2017-18	1989	2689	2482	2117	2498	4137	3441	2394	3261	1989	2735	3428	2568
2018-19	2002	2627	2282	2090	2906	4226	3725	2469	3245	2002	2933	3353	2563
2019-20	1952	2552	2417	2042	2302	3836	3321	2425	3258	1952	2651	3272	2443

PRODUCTION

----- Thousand tonnes -----

2009-10	2475.4	532.2	705.4	3713.0	1728.2	694.2	2422.4	102.4	645.0	2475.4	2905.4	1502.0	6882.8
2010-11	2365.2	445.8	573.0	3384.0	919.4	310.9	1230.3	78.4	130.6	2365.2	1495.8	962.3	4823.3
2011-12	1889.1	456.6	931.3	3277.0	1447.1	813.0	2260.1	94.7	528.6	1889.1	2432.3	1839.0	6160.4
2012-13	1758.1	547.4	1172.5	3478.0	1151.0	692.9	1843.9	93.8	120.2	1758.1	1818.6	1959.2	5535.9
2013-14	2057.1	497.2	926.7	3481.0	1286.1	1331.2	2617.3	111.9	587.9	2057.1	2371.2	2369.8	6798.1
2014-15	2337.2	503.3	807.5	3648.0	1161.5	1491.1	2652.6	131.0	571.2	2337.2	2236.0	2429.6	7002.8
2015-16	2279.2	460.8	762.0	3502.0	1044.6	1528.2	2572.8	153.8	572.7	2279.2	2078.1	2444.0	6801.3
2016-17	2524.4	391.8	558.8	3475.0	929.8	1731.8	2661.6	158.2	554.5	2524.4	1876.1	2448.8	6849.3
2017-18	2816.6	362.5	718.9	3898.0	878.3	1972.2	2850.5	147.5	553.8	2816.6	1794.6	2838.6	7449.8
2018-19	2949.2	351.0	678.8	3979.0	761.4	1809.6	2571.0	153.8	498.1	2949.2	1610.5	2642.2	7201.9
2019-20	3244.0	232.5	667.2	4143.7	599.1	1977.4	2576.5	157.9	535.0	3244.0	1366.6	2802.5	7413.1

Note:- The varieties of basmati grown in the KPK are of different characteristics than those in the Punjab, therefore, area and production of basmati varieties of this province have not been included with data of basmati of Punjab. Instead data of all varieties of rice in the KPK have been included under "Others" in the province as well as on overall basis. Rice grown in Balochistan has been considered as of IRRI variety as variety-wise breakup is not available.

Sources

1. For 2009-10 to 2017-18, Rice Paddy Policy Analysis for Crop of API, M/o NFS&R Islamabad.
2. For 2018-19 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2019-20 : Final estimates of Punjab, Sindh, KPK and Balochistan provided by concerned Provincial Agriculture Departments.

**AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE:
2009-10 TO 2019-20**

Year	PUNJAB				SINDH			KH. PUKH Total (Others)	Baloch. Total (IRRI)	Pakistan			
	Basmati	IRRI	Others	Total	IRRI	Others	Total			Basmati	IRRI	Others	Total

AREA

----- Thousand acres -----

2009-10	3494.1	540.9	737.9	4772.9	1282.3	466.5	1748.8	132.9	469.8	3494.1	2292.9	1337.4	7124.4
2010-11	3296.0	451.0	619.0	4365.9	678.8	213.8	892.6	113.9	472.5	3296.0	1602.3	946.7	5844.9
2011-12	2770.1	453.0	1012.9	4236.0	1001.5	569.5	1571.1	123.8	422.8	2770.1	1877.3	1706.2	6353.6
2012-13	2459.0	518.9	1251.1	4229.0	819.4	443.6	1263.0	120.6	92.7	2459.0	1431.0	1815.3	5705.3
2013-14	2947.0	468.0	1054.9	4470.0	1054.7	787.5	1842.2	136.7	443.6	2947.0	1966.3	1979.1	6892.4
2014-15	3261.9	486.1	892.1	4640.0	1046.3	884.9	1931.2	140.6	430.7	3261.9	1963.0	1917.6	7142.5
2015-16	3099.0	453.0	847.1	4399.1	882.4	896.2	1778.6	159.9	431.9	3099.0	1767.3	1903.2	6769.5
2016-17	3342.9	359.1	589.1	4291.1	823.9	1030.7	1854.6	165.6	420.1	3342.9	1603.0	1785.4	6731.3
2017-18	3500.1	333.1	715.9	4549.0	868.8	1178.0	2046.9	152.2	419.6	3500.1	1621.5	2046.1	7167.7
2018-19	3639.9	330.1	734.9	4705.0	647.4	1058.1	1705.6	153.9	379.3	3639.9	1356.9	1947.0	6943.8
2019-20	4107.0	225.1	682.0	5014.1	643.2	1273.9	1917.2	160.9	405.8	4107.0	1274.1	2116.8	7497.9

YIELD

----- kgs per acre -----

2009-10	708	984	956	778	1348	1488	1385	770	1373	708	1267	1123	966
2010-11	718	989	926	775	1354	1454	1378	688	276	718	934	1016	825
2011-12	682	1008	919	774	1445	1428	1439	765	1250	682	1296	1078	970
2012-13	715	1055	937	822	1405	1562	1460	778	1297	715	1271	1079	970
2013-14	698	1062	878	779	1219	1690	1421	819	1325	698	1206	1197	986
2014-15	717	1035	905	786	1110	1685	1374	932	1326	717	1139	1267	980
2015-16	735	1017	900	796	1184	1705	1446	962	1326	735	1176	1284	1005
2016-17	755	1091	949	810	1129	1680	1435	956	1320	755	1170	1372	1018
2017-18	805	1088	1004	857	1011	1674	1393	969	1320	805	1107	1387	1039
2018-19	810	1063	924	846	1176	1710	1507	999	1313	810	1187	1357	1037
2019-20	790	1033	978	826	931	1552	1344	982	1319	790	1073	1324	989

PRODUCTION

----- Thousand tonnes -----

2009-10	2475.4	532.2	705.4	3713.0	1728.2	694.2	2422.4	102.4	645.0	2475.4	2905.4	1502.0	6882.8
2010-11	2365.2	445.8	573.0	3384.0	919.4	310.9	1230.3	78.4	130.6	2365.2	1495.8	962.3	4823.3
2011-12	1889.1	456.6	931.3	3277.0	1447.1	813.0	2260.1	94.7	528.6	1889.1	2432.3	1839.0	6160.4
2012-13	1758.1	547.4	1172.5	3478.0	1151.0	692.9	1843.9	93.8	120.2	1758.1	1818.6	1959.2	5535.9
2013-14	2057.1	497.2	926.7	3481.0	1286.1	1331.2	2617.3	111.9	587.9	2057.1	2371.2	2369.8	6798.1
2014-15	2337.2	503.3	807.5	3648.0	1161.5	1491.1	2652.6	131.0	571.2	2337.2	2236.0	2429.6	7002.8
2015-16	2279.2	460.8	762.0	3502.0	1044.6	1528.2	2572.8	153.8	572.7	2279.2	2078.1	2444.0	6801.3
2016-17	2524.4	391.8	558.8	3475.0	929.8	1731.8	2661.6	158.2	554.5	2524.4	1876.1	2448.8	6849.3
2017-18	2816.6	362.5	718.9	3898.0	878.3	1972.2	2850.5	147.5	553.8	2816.6	1794.6	2838.6	7449.8
2018-19	2949.2	351.0	678.8	3979.0	761.4	1809.6	2571.0	153.8	498.1	2949.2	1610.5	2642.2	7201.9
2019-20	3244.0	232.5	667.2	4143.7	599.1	1977.4	2576.5	157.9	535.0	3244.0	1366.6	2802.5	7413.1

Note:- The varieties of basmati grown in the KPK are of different characteristics than those in the Punjab, therefore, area and production of basmati varieties of this province have not been included with data of basmati of Punjab. Instead data of all varieties of rice in the KPK have been included under "Others" in the province as well as on overall basis. Rice grown in Balochistan has been considered as of IRRI variety as variety-wise breakup is not available.

Sources

1. For 2009-10 to 2017-18, Rice Paddy Policy Analysis for Crop of API, M/o NFS&R Islamabad.
2. For 2018-19 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2019-20 : Final estimates of Punjab, Sindh, KPK and Balochistan provided by concerned Provincial Agriculture Departments.

DISTRICT-WASE PRODUCTION OF RICE BY VARIETY: AVERAGE OF 2017-18 TO 2019-20

"000"tonnes

S.No	Province/ District	Basmati	IRRI	Others	Total	Percent	S.No	Province/ District	Basmati	IRRI	Others	Total	Percent
Punjab							KPK						
1	Gujranwala	209.2	0.0	291.0	500.1	6.8	1	D.I.Khan	-	-	30.9	30.9	0.4
2	Sheikhupura	317.4	0.0	51.3	368.7	5.0	2	Dir Lower	-	-	22.6	22.6	0.3
3	Okara	186.2	127.0	45.9	359.0	4.9	3	Kurram AG.	-	-	20.9	20.9	0.3
4	Hafizabad	261.6	0.0	52.6	314.2	4.3	4	Swat	-	-	16.7	16.7	0.2
5	Sialkot	227.5	0.0	25.8	253.3	3.4	5	Dir Upper	-	-	14.5	14.5	0.2
6	Nankana Sahib	225.3	0.0	22.5	247.8	3.4	6	Malakand	-	-	11.1	11.1	0.2
7	Bahawalnagar	124.5	16.2	36.4	177.1	2.4	7	Bajour AG.	-	-	7.4	7.4	0.1
8	Pakpattan	134.3	16.1	6.2	156.6	2.1	8	Chitral	-	-	4.5	4.5	0.1
9	Kasur	66.1	13.9	66.4	146.3	2.0	9	Bannu	-	-	4.3	4.3	0.1
10	Jhang	142.9	0.0	1.4	144.3	2.0	10	Mansehra	-	-	4.3	4.3	0.1
11	Narowal	130.1	0.0	1.7	131.8	1.8	11	Battagram	-	-	3.8	3.8	0.1
12	M.B.Din	110.4	0.0	17.9	128.2	1.7	12	Mardan	-	-	3.4	3.4	0.0
13	T.T.Singh	106.8	0.0	0.0	106.8	1.5	13	Shangla	-	-	3.4	3.4	0.0
14	D.G.Khan	6.1	87.8	0.0	93.9	1.3	14	Swabi	-	-	1.0	1.0	0.0
15	Chiniot	73.1	4.9	14.0	92.0	1.3	15	Lakki Marwat	-	-	0.7	0.7	0.0
16	Vehari	70.0	4.3	0.0	74.3	1.0	16	Peshawar	-	-	0.7	0.7	0.0
17	Lahore	45.5	0.0	24.9	70.4	1.0	17	Tank	-	-	0.6	0.6	0.0
18	Khanewal	67.7	0.0	0.7	68.5	0.9	18	Bunir	-	-	0.5	0.5	0.0
19	Muzaffargarh	46.8	16.8	4.4	68.1	0.9	19	Hangu	-	-	0.5	0.5	0.0
20	Multan	52.3	8.3	7.2	67.7	0.9	20	Orakzai AG	-	-	0.5	0.5	0.0
21	Sahiwal	62.3	0.0	0.7	63.0	0.9	21	Charsadda	-	-	0.2	0.2	0.0
22	Gujrat	54.6	0.0	7.2	61.9	0.8	22	Nowshera	-	-	0.1	0.1	0.0
23	Sargodha	55.6	0.0	5.6	61.2	0.8	23	Kohistan	-	-	0.1	0.1	0.0
24	Faisalabad	55.6	0.0	3.6	59.2	0.8	24	F.R.D.I.Khan	-	-	0.1	0.1	0.0
25	Khushab	47.3	0.0	0.0	47.3	0.6	25	N.Waziristan	-	-	0.1	0.1	0.0
26	R.Y.Khan	35.5	3.1	0.0	38.7	0.5	26	Kohat	-	-	0.1	0.1	0.0
27	Bahawalpur	25.8	1.7	0.0	27.5	0.4							
28	Lodhran	25.7	0.0	0.0	25.7	0.3							
29	Layyah	19.8	0.0	1.0	20.8	0.3							
30	Rajanpur	3.0	15.4	0.0	18.5	0.3							
31	Mianwali	11.3	0.0	0.0	11.3	0.2							
32	Jhelum	2.3	0.0	0.0	2.3	0.0							
33	Bhakkar	0.8	0.0	0.0	0.8	0.0							
	Sub Total	3003.2	315.4	688.3	4006.9	54.5		Sub Total	0.0	0.0	153.1	153.1	2.1
Sindh							Balochistan						
1	Badin	-	84.0	390.1	474.1	6.4	1	Jaffarabad	-	302.8	-	302.8	4.1
2	Larkana	-	131.5	256.8	388.2	5.3	2	Nasirabad	-	219.7	-	219.7	3.0
3	Jacobabad	-	37.6	335.7	373.2	5.1	3	Khuzdar	-	2.9	-	2.9	0.0
4	Shikarpur	-	94.4	254.5	348.9	4.7	4	Turbat	-	2.2	-	2.2	0.0
5	Kashmore	-	62.0	234.7	296.7	4.0	5	Awaran	-	0.6	-	0.6	0.0
6	Qambar	-	99.2	186.3	285.6	3.9	6	Jhal Magsi	-	0.5	-	0.5	0.0
7	Thatta	-	159.8	84.9	244.7	3.3	7	Dera Budghti	-	0.2	-	0.2	0.0
8	Dadu	-	63.8	122.3	186.0	2.5	8	Sibi	-	0.1	-	0.1	0.0
9	T.M.Khan	-	13.4	51.3	64.7	0.9							
10	Hyderabad	-	0.6	3.2	3.9	0.1							
	Sindh Total	-	746.3	1919.7	2666.0	36.2		Balochistan Total	-	529.0	-	529.0	7.2
								Pakistan Total	3003.2	1590.6	2761.1	7355.0	100.0

Notes: 1. Data have been arranged in descending order on the basis of total production of rice in each district.
2. Percentage share calculated on the basis of country total.
3. Rounding may result in slight differences in figures.

Source: Respective Provincial Agriculture departments

PER CAPITA AVAILABILITY CONSUMPTION OF RICE: 2016-17 to 2018-19

S.No	Items	2016-17	2017-18	2018-19
		-----Thousands tonnes-----		
	Production	6849	7450	7202
2	Deduction for seed, feed and wastage @ 6 percent for production	411	447	432
3	Export	3523	4097	4120
4	Net availability	2915	2906	2650
		-----Millions-----		
5	Population	205.90	209.54	213.78
		-----Kgs-----		
6	Per capita availability (consumption)	14.16	13.87	12.40
7	Average per capita availability			
	Average (2016-17 to 2018-19)		13.47	

Sources:

- 1 For Imports and Exports:
- 2 For Population of Pakistan:

Federal Bureau of Statistics, Karachi.
Economic Survey, 2019-20.

Average farmer cost of production of Basmati paddy in Punjab: 2019-20 and 2020-21 crops

S. No	Operation/input	Unit	Avg. no of operation/acre	Rate/	Cost/	Rate/	Cost/	Change in 2020-21 over 2019-20
				unit	acre	unit	acre	
				2019-20		2020-21		
			Rs.....Rs.....			
1	Land preparation							
	1.1 Dry ploughing	No. of ploughings/ acre	3.000	800.0	2400	825.0	2475	75
	1.2 Dry planking	No. of plankings/ acre	0.300	400.0	120	412.5	124	4
	1.3 Wet ploughing	No. of ploughings/ acre	3.000	1200.0	3600	1200.0	3600	0
	1.4 Wet planking	No. of plankings/ acre	2.000	600.0	1200	600.0	1200	0
	1.5 Rotavator	No. of ploughings/ acre	0.400	1050.0	420	1100.0	440	20
	1.6 Levelling	Tractor Hours./ acre	1.000	900.0	900	950.0	950	50
2	Seed							
	2.1 Cost of nursery	Rs./ acre			1500		1800	300
	2.2 Cost of nursery uprooting, transport and planting	Rs./acre			4500		5000	500
3	Labour for bund making	M. day/ acre	0.984	500	492	550	541	49
4	Weeding							
	4.1 Manual	No./ acre	1.150	500	575	550	633	58
	4.2 Weedicides	No. of applications/ acre	1.000	669	669	690	690	21
	4.3 Pesticides spray	"	1.000	1000	1000	1250	1250	250
5	Irrigation							
	5.1 Canal	Rs./ acre			95.72		95.72	0
	5.2 Private tube well	No. of irrigations/acre	10.000	875	8750	900	9000	250
	5.3 Labour used for irrigation & water course cleaning	M. days/ acre	6.100	500	3050	550	3355	305
6	FYM @ 25% of the actual cost including transport & application	No. of trolleys	1.340	2600	871	2750	921	50
7	Fertilizer							
	7.1 DAP	No. of bag/ acre	1.000	3740	3740	3600	3600	-140
	7.2 Urea	"	2.000	1850	3700	1900	3800	100
	7.3 NP	"	0.060	2525	152	2590	155	4
	7.4 Zinc sulphate	"	0.840	860	722	1000	840	118
	7.5 Potash	"	0.070	3500	245	3600	252	7
	7.6 Fertilizer transport & application	Rs./ bag	3.970	128	508	130	516	8
8	Traded inputs cost (Item 1 to 7)	Rs/ acre			39210		41238	2028
9	Mark up on investment @ 14.5 % for 6 months on item 8-item 5.1	"			2843		2990	147
10	Harvesting, threshing etc	Rs/ acre			2816		3000	184
11	Management charges for 6 months	Rs/ acre			1719		1719	0
12	Land rent for 6 months	Rs./acre/annum		30000	15000	30000	15000	0
13	Land revenue, local rate, panchotra etc	"			5		5	0
14	Average land tax @ Rs 132 acre/ annum	"		132	66	132	66	0
15	Gross cost (item 1 to 15)	Rs./ acre			61658		64018	2359
16	Value of paddy straw	Rs./acre			6000		6400	400
17	Net cost of cultivation (item 15-16)	Rs./acre						
	17.1 Including land rent	Rs./ acre			55658		57618	1959
	17.2 Excluding land rent	Rs./ acre			40658		42618	1959
18	Yield	Kg/ acre			1363		1363	0
19	Cost of production at farm gate (Rs./40 Kg)							
	19.1 With land rent	Rs./ 40 Kg			1633		1691	57
	19.2 Without land rent	Rs./ 40 Kg			1193		1251	57
20	Marketing charges (Rs./ 40 Kg)	Rs./ 40 Kg			50		55	5
21	Cost of production at market level (Rs./40 Kg)							
	21.1 With land rent	Rs./ 40 Kg			1683		1746	62
	21.2 Without land rent	Rs./ 40 Kg			1243		1306	62

Average farmer cost of production of IRRI paddy in Sindh: 2019-20 and 2020-21 crops

S. No	operation/Input	Unit	Avg. no of operations/acre	Rate/	Cost/	Rate/	Cost/	Change in 2020-21 over 2019-20
				unit	acre	unit	acre	
				2019-20		2020-21		
				...Rs....		...Rs....		
1	Land preparation							
	1.1 Dry ploughing	No	5.000	900.0	4500	1000.0	5000	500
	1.2 Dry planking	"	1.000	450.0	450	500.0	500	50
	1.3 Levelling	Tractor Hour/acre	1.000	900.0	900	1000.0	1000	100
2	Nursery							
	2.1 Cost of nursery	Rs./ acre	1.000	3500	3500	3800	3800	300
	2.2 Cost of nursery uprooting, transport and planting	Rs./acre			3200		3500	
3	Labour for bund making	M. day/ acre	2.000	500	1000	525	1050	50
4	Manual weeding	M. day/ acre	2.400	500	1200	525	1260	60
5	Plant protection							
	5.1 Weedicide	No. of applications/ acre	0.730	665	485	700	511	26
	5.2 Formulated spray	No. of applications/ acre	0.390	1177	459	1200	468	9
6	FYM @ 25% of the actual cost including transport & application	No. of trolleys	1.000	3500	875	3600	900	25
7	Fertilizer							
	7.1 DAP	No. of bag/ acre	1.000	3600	3600	3700	3700	100
	7.2 Urea	"	2.000	1839	3678	1850	3700	22
	7.3 Zinc sulphate	"	0.100	700	70	750	75	
	7.4 Fertilizer transport & application	Rs./ bag	3.100	125	388	130	403	16
8	Irrigation							
	8.1 Canal	No. of irrigation/ acre	17.900	-	95.7	-	95.7	
	8.2 Private tube well (Rs./ irrigation)	No. of irrigation/ acre	0.500	900.0	450	969.0	485	35
	8.3 Labor used for irrigation & water course cleaning	M. day/ acre	5.600	500.0	2800	525.0	2940	140
9	Traded inputs cost (Item 1 to 9 minus 9.1)	Rs/ acre			27555		29292	1737
10	Mark up on investment @ 13% for 6 months on item 10	"			1998		1904	-94
11	Harvesting, threshing etc	Rs/ acre			2000		2250	250
12	Management charges for 6 months	Rs			1719		1719	0
13	Land rent for 6 months	Rs./acre/annum		30000	15000	30000	15000	0
14	Land revenue, local rate, panchotra etc	"		5	5	5	5	
15	Average land tax @ Rs 132 acre/ annum	"		132	66	132	66	
16	Drainage Cess			24	12	24	12	
17	Gross cost (Item 1-17)	Rs./ acre			48450		50343	1893
18	Value of paddy straw	Rs./acre			3700		4000	
19	Net cost of cultivation (Item 18-19)	Rs./ acre			44750		46343	1593
20	Yield	Kg/ acre			2000		2000	
21	Cost of production at farm gate (Rs./40 Kg)							
	21.1 With land rent	Rs./ 40 Kg			895		927	32
	21.2 Without land rent	Rs./ 40 Kg			595		627	32
22	Marketing charges (Rs./ 40 Kg)	Rs./ 40 Kg			50		55	
23	Cost of production at market level (Rs./40 Kg)	Rs./ 40 Kg						
	23.1 With land rent	Rs./ 40 Kg			945		982	37
	23.2 Without land rent	Rs./ 40 Kg			645		682	37

Annex-VI

ECONOMICS OF RICE PADDY AND COMPETING CROPS AT
PRICES REALIZED BY THE GROWERS: 2019-20 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		
		Days	Acre inches								Rupee of purchased inputs	Crop day	Acre inch of water used
		1	2	3	4	5	6	7=6-5	8=6-4	9=6/4	10=6/5	11=6/2	12=6/3

Punjab

1	Basmati Paddy	180	58	62874	31003	70743	39740	7868	1.13	2.28	393	1220
2	IRRI Paddy	180	62	64826	29022	67198	38175	2371	1.04	2.32	373	1084
3	Seed Cotton	240	22	73136	24409	83089	58680	9953	1.14	3.40	346	3777
4	Wheat	180	12	48303	14558	50919	36361	2616	1.05	3.50	283	4243
5	Sunflower (spring)	180	22	51601	18548	55538	36989	3937	1.08	2.99	309	2524
6	Seed Cotton + Wheat	420	34	121439	38968	134008	95040	12569	1.10	3.44	319	3941
7	Seed Cotton+Sunflower	420	44	124737	42957	138627	95669	13889	1.11	3.23	330	3151
8	Basmati Paddy+Wheat	360	70	111178	45561	121662	76100	10484	1.09	2.67	338	1738
9	Basmati Paddy+Sunflower	360	80	114475	49551	126280	76729	11805	1.10	2.55	351	1579
10	IRRI Paddy + Wheat	360	74	113129	43581	118117	74536	4987	1.04	2.71	328	1596
11	IRRI Paddy+Sunflower	360	84	116427	47571	122735	75164	6308	1.05	2.58	341	1461
12	Sugarcane	394	48	116197	39651	139103	99452	22906	1.20	3.51	353	2898

Sindh

1	IRRI Paddy	180	56	53211	18745	59950	41205	6739	1.13	3.20	333	1071
2	Seed Cotton	240	18	80876	27403	90757	63354	9881	1.12	3.31	378	5042
3	Wheat	180	12	49199	15595	53184	37589	3985	1.08	3.41	295	4432
4	Sunflower (spring)	180	22	38783	14018	38824	24806	41	1.00	2.77	216	1765
5	Seed Cotton + Wheat	420	30	130075	42998	143941	100943	13866	1.11	3.35	343	4798
6	Seed Cotton+Sunflower	420	40	119659	42998	129581	86583	9922	1.08	3.01	309	3240
7	IRRI Paddy+ Wheat	360	68	102410	34340	113134	78794	10724	1.10	3.29	314	1664
8	IRRI Paddy+Sunflower	360	78	91994	32762	98774	66011	6779	1.07	3.01	274	1266
9	Sugarcane	488	71	109973	37066	127210	90144	17236	1.16	3.43	261	1792

Notes for Annex - VI:

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2019-20 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, 2019-20 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 2019-20 crops. To incorporate the escalations in input prices, which occurred during the growing period of 2019-20 crops, some marginal revisions/updates have been incorporated.
3. Water use has been estimated from the number of irrigations as reported in the cost of production estimates of the respective crops assuming each irrigation of 3 inches and 'rauni' of 4 inches.
4. The following prices as realized by the growers for different crops are adopted for the analysis:
 - 4.1 The support price of Rs 1400 per 40 kgs, as maintained by the government for 2019-20 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 1950 and Rs 1350 per 40 kgs, respectively. While, the average price of IRRI paddy in Sindh is reported at Rs 1300 per 40 kgs.
 - 4.3 The wholesale market prices of seed cotton during the post-harvest months of 2019-20 in the main producer area markets have averaged at Rs 3949 per 40 kgs in the Punjab and Rs 3634 Sindh.
 - 4.4 The price of Sunflower crops has been reported hovering around Rs 3000/40 kgs and Rs 3050/40 kgs for Canola during 2019-20.
 - 4.5 The average market prices of sugarcane as realized by the farmers are taken for the analysis i.e Rs 220 per 40 kgs in the Punjab and in Sindh. However, the prices notified by the provincial governments were lower i.e Rs 190 and 192, respectively for Punjab and 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 18 per 40 kgs in Punjab and Sindh for sugarcane, Rs 40 for seed cotton in Punjab and Sindh, Rs 50 for rice paddy in Punjab and Sindh, and for wheat and oilseeds, Rs 38 in Punjab and Rs 42 in Sindh.
6. Gross income = (Yield per acre multiplied by price of principal produce at farm gate) plus (value of by-products per acre).
7. Cost of purchased inputs = Cost incurred on seed and related items, fertilizer, supplementary irrigation including labour, canal water rate, pesticides and Weedicides.

8. Gross margin = Gross income minus cost of purchased inputs.
9. Net income = Gross income minus gross cost.
10. Output-input ratio = Gross income divided by gross cost
11. Revenue per rupee of = Gross income divided by cost of purchased
purchased inputs cost inputs
12. Revenue per crop day= Gross income divided by crop duration in days.
13. Revenue per acre-inch= Gross income divided by irrigation water
of water used used in acre inches

EXPORT PARITY PRICES OF BASMATI PADDY ON THE BASIS OF FOB (KARACHI) PRICE

S.No	Item	During June, 2020	
		Basmati	IRRI-6
		----- US \$ Per Tonne -----	
1.	Average fob (Karachi) prices of rice US\$ per tonne	847.95	450.12
	Current exchange rate (Rs per US\$)	167.39	167.39
	Pak Rupees per tonne	141938	75346
		----- Rs per 40 kgs -----	
2.	Expenses from sheller/ market to export point	5678	3014
		175	100
3.	Producer area market level price of rice (item 1-item 2)	5503	2914
4.	Product recoveries per 100 kgs of paddyKgs.....	
	i) Rice	48.0	58.00
	ii) Brokens	5.0	5.0
	iii) Tips	3.5	2.5
	vi) Bran powder	8.8	25.0
	v) Husk	25.0	5.0
	vi) Dust and inert matter	9.7	4.5
5.	Prices of products	-----Rs per 40 kgs-----	
	i) Rice as calculated in item 3	5503	2914
	ii) Brokens	3302	2040
	iii) Tips	1000	1000
	vi) Bran powder	800	800
	v) Husk	250	252
	vi) Dust and inert matter	0.00	0.00
6.	Value of products recoverable from 100 kgs paddy	-----Rupees-----	
	i) Rice as calculated in item 3	6603	4225
	ii) Broken (a)	413	255
	iii) Tips	88	63
	vi) Bran powder (b)	70	50
	v) Husk and dust	55	158
	vi) Total value of all products	7228	4750
7.	Husking/Processing /financial per 100 kgs	300	300
8.	Mill-gate price of paddy per 100 kgs	6928	4450
9.	Mill-gate price of paddy per 40 kgs	2771	1780

Sources:

- 1 Federal Bureau of Statistics, Karachi.
- 2 Rice Exporters/Millers for incidental charges.

EXPORT PARITY PRICES OF BASMATI PADDY ON THE BASIS OF FOB (KARACHI) PRICE

S.No	Item	During 2019-20		
		Basmati		IRRI-6
		----- US \$ Per Tonne -----		
1.	Average fob (Karachi) prices of rice			
	US\$ per tonne	888.32		422.69
	Current exchange rate (Rs per US\$)	167.39		167.39
	Pak Rupees per tonne	148696		70754
		----- Rs per 40 kgs -----		
2.	Expenses from sheller/ market to export point	5948		2830
		175		100
3.	Producer area market level price of rice (item 1-item 2)	5773		2730
4.	Product recoveries per 100 kgs of paddyKgs.....		
	i) Rice	48.0		58.00
	ii) Brokens	5.0		5.0
	iii) Tips	3.5		2.5
	vi) Bran powder	8.8		25.0
	v) Husk	25.0		5.0
	vi) Dust and inert matter	9.7		4.5
5.	Prices of products	-----Rs per 40 kgs-----		
	i) Rice as calculated in item 3	5773		2730
	ii) Brokens	3464		1911
	iii) Tips	1000		1000
	vi) Bran powder	800		800
	v) Husk	250		252
	vi) Dust and inert matter	0.00		0.00
6.	Value of products recoverable from 100 kgs paddy	-----Rupees-----		
	i) Rice as calculated in item 3	6927		3959
	ii) Broken (a)	433		239
	iii) Tips	88		63
	vi) Bran powder (b)	70		50
	v) Husk and dust	55		158
	vi) Total value of all products	7573		4468
7.	Husking/Processing /financial per 100 kgs	300		300
8.	Mill-gate price of paddy per 100 kgs	7273		4168
9.	Mill-gate price of paddy per 40 kgs	2909		1667

Sources:

- 1 Federal Bureau of Statistics, Karachi.
- 2 Rice Exporters/Millers for incidental charges.

EXPORT PARITY PRICES OF BASMATI PADDY ON THE BASIS OF FOB (KARACHI) PRICE

S.No	Item	During 2017-18 to 2019-20		
		Basmati		IRRI-6
		----- US \$ Per Tonne -----		
1.	Average fob (Karachi) prices of rice US\$ per tonne	970.11		419.56
	Current exchange rate (Rs per US\$)	167.39		167.39
	Pak Rupees per tonne	162387		70230
		----- Rs per 40 kgs -----		
2.	Expenses from sheller/ market to export point	6495		2809
		175		100
3.	Producer area market level price of rice (item 1-item 2)	6320		2709
4.	Product recoveries per 100 kgs of paddyKgs.....		
	i) Rice	48.0		58.00
	ii) Brokens	5.0		5.0
	iii) Tips	3.5		2.5
	vi) Bran powder	8.8		25.0
	v) Husk	25.0		5.0
	vi) Dust and inert matter	9.7		4.5
5.	Prices of products	-----Rs per 40 kgs-----		
	i) Rice as calculated in item 3	6320		2709
	ii) Brokens	3792		1896
	iii) Tips	1000		1000
	vi) Bran powder	800		800
	v) Husk	250		252
	vi) Dust and inert matter	0.00		0.00
6.	Value	-----Rupees-----		
	i) Rice as calculated in item 3	7585		3928
	ii) Broken (a)	474		237
	iii) Tips	88		63
	vi) Bran powder (b)	70		50
	v) Husk and dust	55		158
	vi) Total value of all products	8271		4435
7.	Husking/Processing /financial per 100 kgs	300		300
8.	Mill-gate price of paddy per 100 kgs	7971		4135
9.	Mill-gate price of paddy per 40 kgs	3188		1654

Sources:

- 1 Federal Bureau of Statistics, Karachi.
- 2 Rice Exporters/Millers for incidental charges.

Annex- X

REGION WISE EXPORT OF BASMATI AND COARSE RICE DURING : 2017-18 AND 2018-19

Region	Quantity			Value			% share in in total export	
	2017-18	2018-19	%	2017-18	2018-19	%	2017-18	2018-19
	...000 tonnes.....		Change	...Million US \$...		Change	Per cent	

A. Basmati Rice

Asia	219.29	330.78	50.84	229.93	322.79	40.39	39.09	50.15
Oceania	14.44	17.74	22.88	16.13	17.31	7.27	2.57	2.69
Europe	240.58	199.67	-17.00	248.79	194.34	-21.89	42.88	30.27
Africa	29.91	39.33	31.49	29.13	36.33	24.72	5.33	5.96
America	26.81	37.57	40.16	33.14	38.16	15.12	4.78	5.70
CIS	30.02	34.49	14.90	31.40	32.21	2.57	5.35	5.23
Total	561.03	659.57	17.56	588.53	641.14	8.94	100.00	100.00

B. Coarse Rice

Asia	1037.25	1212.01	16.85	457.24	500.41	9.44	35.19	44.53
Oceania	2.74	1.54	-43.92	1.68	0.66	-60.51	0.09	0.06
Europe	28.37	41.29	45.57	12.47	25.53	104.77	0.96	1.52
Africa	1585.41	1305.04	-17.68	607.51	500.77	-17.57	53.79	47.95
America	102.85	83.81	-18.51	38.36	32.50	-15.28	3.49	3.08
CIS	190.66	78.02	-59.08	74.09	29.47	-60.23	6.47	2.87
Total	2947.28	2721.71	-7.65	1191.35	1089.34	-39.38	100.00	100.00

Source:

FBS, Karachi

ECONOMIC EFFICIENCY OF RESOURCE USE IN BASMATI (PADDY) PRODUCTION IN PUNJAB

Based on export parity prices

Description	Revenues	Traded inputs cost	Domestic	
			factor cost	Profits
----- Rupees per acre -----				
2015-16				
Private Prices	29578	20133	25316	-15870
Social Prices	52821	21389	25537	5896
Transfers	-23243	-1255	-221	-21766
2016-17				
Private Prices	43000	16230	26447	324
Social Prices	68290	16877	26668	24745
Transfers	-25290	-647	-221	-24421
2017-18				
Private Prices	55690	15361	27137	13192
Social Prices	96460	16158	27358	52943
Transfers	-40770	-797	-221	-39751
2018-19				
Private Prices	67080	20763	31765	14552
Social Prices	100768	21732	31986	47050
Transfers	-33688	-969	-221	-32498
2019-20				
Private Prices	82839	26780	34878	21181
Social Prices	103420	27772	35100	40548
Transfers	-20581	-992	-221	-19368

Annex-XII

ECONOMIC EFFICIENCY OF RESOURCE USE IN IRRI (PADDY) PRODUCTION IN SINDH

Based on export parity prices

Description	Revenues	Traded inputs cost	Domestic Factor cost	Profits
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----- Rupees per acre -----

2015-16

Private Prices	37472	14872	23255	-655
Social Prices	29255	14069	23409	-8223
Transfers	8216	803	-154	7568

2016-17

Private Prices	47260	10727	23702	12831
Social Prices	29330	10174	23877	-4721
Transfers	17930	553	-175	17552

2017-18

Private Prices	50835	10695	23693	16447
Social Prices	42145	10149	23868	8128
Transfers	8690	546	-175	8319

2018-19

Private Prices	59750	14277	27134	18339
Social Prices	77550	13764	27343	36443
Transfers	-17800	513	-209	-18104

2019-20

Private Prices	67400	17076	31375	18950
Social Prices	84550	16316	31584	36650
Transfers	-17150	759	-209	-17700

ANNEX-XIII

**AREA AND PRODUCTION OF MAJOR RICE PRODUCING COUNTRIES
IN THE WORLD: 2019 CROP**

S.NO.	NAME OF COUNTRY	Area Million (ha)	Percent share
1	India	44.500	26.63
2	China, mainland	30.189	18.06
3	Indonesia	15.995	9.57
4	Bangladesh	11.910	7.13
5	Thailand	10.407	6.23
6	Viet Nam	7.571	4.53
7	Myanmar	6.706	4.01
8	Philippines	4.800	2.87
9	Nigeria	3.346	2.00
10	Cambodia	2.982	1.78
11	Pakistan	2.810	1.68
12	Brazil	1.861	1.11
13	Guinea	1.860	1.11
14	Japan	1.470	0.88
15	Nepal	1.470	0.88
16	Democratic Republic of the Congo	1.303	0.78
17	United Republic of Tanzania	1.200	0.72
18	United States of America	1.180	0.71
19	Sri Lanka	1.041	0.62
20	Mali	0.970	0.58
21	Madagascar	0.928	0.56
22	Lao People's Democratic Republic	0.848	0.51
23	Sierra Leone	0.796	0.48
24	Côte d'Ivoire	0.775	0.46
25	Republic of Korea	0.738	0.44
26	Malaysia	0.667	0.40
27	Colombia	0.636	0.38
Total		158.959	95.11
World Total		167.133	100.00
S.NO.	NAME OF COUNTRY	Production Million (tonnes)	Percent share
1	China, mainland	141.419	27.13
2	India	115.053	22.07
3	Indonesia	55.358	10.62
4	Bangladesh	37.612	7.21
5	Viet Nam	29.364	5.63
6	Thailand	21.461	4.12
7	Myanmar	16.945	3.25
8	Philippines	12.711	2.44
9	Brazil	7.833	1.50
10	Pakistan	7.202	1.38
11	Cambodia	7.098	1.36
12	United States of America	6.780	1.30
13	Japan	6.485	1.24
14	Nigeria	4.540	0.87
15	Republic of Korea	3.464	0.66
16	Nepal	3.435	0.66
17	Egypt	3.267	0.63
18	Madagascar	2.687	0.52
19	Sri Lanka	2.620	0.50
20	Lao People's Democratic Republic	2.390	0.46
21	Peru	2.372	0.45
22	Colombia	2.215	0.42
23	Mali	2.112	0.41
24	United Republic of Tanzania	2.011	0.39
25	Malaysia	1.813	0.35
26	Guinea	1.560	0.30
27	Côte d'Ivoire	1.406	0.27
Total		501.211	96.14
World Total		521.333	100.00

Source: FAO Stat.

Note: Rice production has worked out from paddy production assuming rice paddy ratio is 2/3.

YIELD PER HECTARE OF MAJOR RICE PRODUCING COUNTRIES IN THE WORLD: 2019 CROP

					KGS/HA	
S.NO.	NAME OF COUNTRY	YIELD	S.NO.	NAME OF COUNTRY	YIELD	
1	Australia	6924	46	Senegal	2920	
2	Egypt	5884	47	Madagascar	2895	
3	United States of America	5747	48	Bhutan	2859	
4	Uruguay	5667	49	Kenya	2833	
5	Peru	5416	50	Lao People's Democratic Republic	2818	
6	Turkey	5216	51	Venezuela (Bolivarian Republic of)	2770	
7	Morocco	5194	52	Malaysia	2718	
8	Spain	5131	53	Honduras	2688	
9	Tajikistan	5099	54	Philippines	2648	
10	Greece	4892	55	Hungary	2641	
11	China, Taiwan Province of	4788	56	India	2585	
12	Republic of Korea	4695	57	<i>Pakistan</i>	2563	
13	China, mainland	4684	58	Myanmar	2527	
14	Argentina	4602	59	Sri Lanka	2517	
15	Japan	4412	60	Kyrgyzstan	2396	
16	Italy	4392	61	Cambodia	2381	
17	Chile	4354	62	Rwanda	2337	
18	El Salvador	4265	63	Nepal	2337	
19	Brazil	4208	64	Sudan	2330	
20	Paraguay	4200	65	Cuba	2298	
21	Mexico	4190	66	Iran (Islamic Republic of)	2287	
22	North Macedonia	4083	67	Benin	2265	
23	Viet Nam	3879	68	Niger	2261	
24	Guyana	3846	69	Panama	2226	
25	Bulgaria	3842	70	Mali	2178	
26	Russian Federation	3841	71	Dominican Republic	2172	
27	Ukraine	3662	72	Bolivia (Plurinational State of)	2125	
28	France	3652	73	Eswatini	2112	
29	Portugal	3649	74	Thailand	2062	
30	Mauritania	3541	75	Ethiopia	2027	
31	Nicaragua	3511	76	Fiji	2000	
32	Romania	3503	77	Afghanistan	1998	
33	Uzbekistan	3498	78	Gabon	1990	
34	Colombia	3482	79	Timor-Leste	1984	
35	Indonesia	3461	80	Azerbaijan	1979	
36	Iraq	3298	81	Guatemala	1923	
37	Réunion	3293	82	Ghana	1883	
38	Belize	3281	83	Uganda	1870	
39	Suriname	3247	84	South Africa	1860	
40	Somalia	3246	85	Côte d'Ivoire	1814	
41	Kazakhstan	3173	86	Haiti	1798	
42	Bangladesh	3158	87	United Republic of Tanzania	1676	
43	Costa Rica	3031	88	Zimbabwe	1509	
44	Ecuador	3017	89	Algeria	1391	
45	Democratic People's Republic of Korea	2955	90	Papua New Guinea	1388	

Source: FAO, Statistic Division

AVAILABILITY OF CERTIFIED SEED OF RICE PADDY: 2013-14 TO 2018-19

Year	Province	Area			Seed requirement at		Total Seed available	Availability of seed	
		Basmati	Irri+Others	Total	Gross	Replacement @ 20 %		Gross requirement	Replacement requirement
		----- 000 hect -----			----- tonnes -----			(per cent)	
2014-15	Punjab	1320.0	557.7	1877.7	29782.5	5956.5	38323.0	128.7	643.4
	Sindh	0.0	781.5	781.5	19537.5	3907.5	7044.0	36.1	180.3
	KPK	0.0	56.9	56.9	1422.5	284.5	234.0	16.4	82.2
	Balochistan	0.0	174.3	174.3	4357.5	871.5	2627.0	60.3	301.4
	Total	1320.0	1570.4	2890.4	55100.0	11020.0	48228.0	87.5	437.6
2015-16	Punjab	1254.1	526.1	1780.2	28201.7	5640.3	37253.5	132.1	660.5
	Sindh	0.0	719.8	719.8	17994.3	3598.9	6847.9	38.1	190.3
	KPK	0.0	64.7	64.7	1617.5	323.5	171.2	10.6	52.9
	Balochistan	0.0	174.8	174.8	4370.0	874.0	2046.0	46.8	234.1
	Total	1254.1	1485.4	2739.5	52183.5	10436.7	46318.6	88.8	443.8
2016-17	Punjab	1352.8	383.7	1736.5	25826.1	5165.2	44468.5	172.2	860.9
	Sindh	0.0	750.5	750.5	18763.0	3752.6	7042.8	37.5	187.7
	KPK	0.0	67.0	67.0	1675.0	335.0	23.2	1.4	6.9
	Balochistan	0.0	170.0	170.0	4250.0	850.0	0.0	0.0	0.0
	Total	1352.8	1371.2	2724.0	50514.1	10102.8	51534.6	102.0	510.1
2017-18	Punjab	1416.4	424.5	1840.9	27609.3	5521.9	44468.5	161.1	805.3
	Sindh	0.0	828.3	828.3	20707.5	4141.5	7042.8	34.0	170.1
	KPK	0.0	61.6	61.6	1540.0	308.0	67.0	4.4	21.8
	Balochistan	0.0	169.8	169.8	4245.0	849.0	0.0	0.0	0.0
	Total	1416.4	1484.2	2900.6	54101.8	10820.4	51578.3	95.3	476.7
2018-19	Punjab	1494.1	429.7	1923.8	28671.7	5734.3	59058.0	206.0	1029.9
	Sindh	0.0	690.2	690.2	17255.0	3451.0	6486.4	37.6	188.0
	KPK	0.0	62.3	62.3	1557.5	311.5	33.3	2.1	10.7
	Balochistan	0.0	153.5	153.5	3837.5	767.5	0.0	0.0	0.0
	Total	1494.1	1335.7	2829.8	51321.7	10264.3	65577.7	127.8	638.9
2019-20	Punjab	1662.0	367.1	2029.1	29121.5	5824.3	40966.4	140.7	703.4
	Sindh	0.0	775.8	775.8	19395.8	3879.2	2355.0	12.1	60.7
	KPK	0.0	65.1	65.1	1627.5	325.5	695.0	42.7	213.5
	Balochistan	0.0	164.2	164.2	4105.0	821.0	210.0	5.1	25.6
	Total	1662.0	1372.2	3034.2	54249.8	10850.0	44226.4	81.5	407.6

Notes:

The area under rice for the Punjab province represents area under basmati, IRRI and Others varieties while that of Sindh represents the area under IRRI and 'Other varieties'. For KPK and Balochistan total area under rice represents 'Othrs' and IRRI varieties, respectively.

The seed requirement has been worked by using the seed rate of 12 kgs per hectare for basmati and 25 kgs per hectare for IRRI and 'others' varieties.

Sources:

For Area: Annex-I
For Seed: FSC&RD, Islamabad