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RICE PADDY POLICY ANALYSIS FOR 2018-19 CROP

AGRICULTURE POLICY INSTITUTE
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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 Practise
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 2018-19 CROP

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Findings:

1. Area and Production

- Overall rice production at country level during the decade ending 2017-18 has increased @ 2.0 per cent per annum owing to 0.6 per cent expansion in area and 1.4 per cent improvement in yield.

- The total production of rice for 2017-18 crop is estimated at 7.450 million tonnes at country level, higher by 8.8 per cent than the 6.849 million tonnes in 2016-17.

- Basmati rice is produced in the Punjab only.

- Sindh plays an imperative role in total production of IRRI rice, contributing 51.6 per cent in area and 49.6 per cent in production while the shares of the Punjab and Balochistan are 22.9 and 25.5 per cent in area and 21.1 and 29.2 per cent in production respectively.

- Shares of the Punjab, Sindh and Khyber Pakhtunkhwa in production of 'other' varieties of rice are 26.4, 67.7 and 5.9 per cent respectively.

2. Domestic Prices

- Monthly average wholesale market prices of super basmati paddy during 2016-17 crop ranged between Rs. 1400 and Rs. 1797/40 kgs during the post-harvest in major rice producing area markets.

- In Sindh, the monthly average wholesale market prices of IRRI paddy in major rice producing area markets ranged from Rs. 840 to Rs.925/40 kgs during the post-harvest period.

3. Cost of Production

- The cost of cultivation of basmati paddy in the Punjab for 2018-19 crop is estimated at Rs. 48924 per acre.

- ❖ While the cost of production of basmati paddy at market level is estimated around Rs. 1681 per 40 kgs, including marketing cost.

- ❖ The cost of cultivation of IRRI paddy in Punjab is estimated at Rs. 43963 per acre.

- ❖ While the cost of production of IRRI paddy at market level in Punjab is estimated at Rs. 1084 per 40 kgs.

- ❖ The cost of cultivation of IRRI paddy in Sindh for 2018-19 crop is estimated at Rs. 41339 per acre.

- ❖ The market level cost of production of IRRI paddy in Sindh would come to Rs. 877 per 40 kgs.

4. Economics of Rice Paddy and Competing Crops

- ➢ Rice being 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 performance in Punjab remained significantly lower than cotton in all terms of returns i.e. output-input ratio, rupee of purchased inputs, days of crop duration and acre-inch of irrigation water used.

- ➢ IRRI paddy in the Punjab also could not perform well against cotton in any of the economic indicators analyzed.

- ➢ In Sindh, IRRI cultivation surpassed seed cotton only in terms of output-input ratio marginally while lagged behind in all other terms of return.

5. Real Prices

- ➢ The real market prices of basmati paddy in the Punjab witnessed mixed trend during 2007-08 to 2017-18 crops years. In three years it remained higher than the base year's price of Rs. 920/40 kgs while in other seven years it stood less than the base year price.

- ➢ In Sindh, in the reference period, the base year real market price remained higher except two years i.e. 2009-10 and 2010-11.

6. World Situation

- ➢ World rice production in 2017-18 is estimated at 489.8 million tonnes, higher by 0.6 percent than last year production and 0.2 percent from the projected rice production of 490.78 million tonnes in 2018-19.

- The world rice trade during 2017-18 is reported at 48.11 million tonnes, showing 0.9 per cent increase over last year.
- The world rice trade in 2018-19 is forecasted at 48.77 million tonnes, showing 1.4 per cent higher than estimated trade of 2017-18.

7. Export Parity Prices

- International prices of basmati rice during 2014-18 are reported at US $ 952 to 1106 per tonne while the export parity prices of paddy ranged between Rs. 2579 to 3032 per 40 kgs.

- International prices of IRRI rice in the referred period ranged at US $ 347 to 362 per tonne and the export parity prices of IRRI paddy ranged between Rs.752 to Rs. 789 per 40 kgs.

8. Economic Efficiency

- Economic efficiency of resources use in rice production has been evaluated by estimating the Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC) and Domestic Resource Cost (DRC).

- NPC value for basmati paddy remained less than one during the entire period of 2011-18 except 2013-14, implying that rice producers have not received the economic price for their produce.

- Similarly EPC value for basmati paddy in the Punjab also remained less than one throughout the referred period except two years i.e. 2012-13 and 2013-14.

- In case of IRRI rice in Sindh, the NPCs and EPCs both immensely fluctuated and remained more than one, showing some implicit protection to the IRRI growers in the country.

- DRC indicates the opportunity cost of domestic resource used in the production of a commodity. The DRC less than one indicate a commodity system having comparative advantage and vice versa.

- DRCs for basmati have been less than one during the period under review, implying that Pakistan has comparative advantage in basmati production.

- The DRCs for IRRI paddy in Sindh remained less than one throughout the referred period except two years, i.e 2015-16 and 2016-17. In 2017-18 is indicating comparative advantage for Sindh in producing IRRI rice for export.

9. World Comparison

- Pakistan is the 11th & 10th largest rice producer in terms of area and production respectively but holds 58th position in terms of yield in the world.
- In terms of area, India is on the top with 42.965 million hectares, followed by China with 30.200 million hectares and Indonesia with 14.275 million hectares.
- In terms of rice production, China is on the top with 209.503 million tonnes, followed by India with 158.757 million tonnes and Indonesia with 77.289 million tonnes.
- In terms of yield per hectare, Australia lies on the top with 10289 kgs/hectare, followed by Egypt with 9367 and Uruguay with 8569 kgs/hectare.

10. Policy Options

- Based on the analysis of relevant factors covered in the main text of the Report, the likely policy options for rice paddy 2018-19 crop are presented below:

Base		**Worked back price of Rice paddy at mill-gate** (Rupees per 40 kgs)
A.	**Export parity prices based on actual Fob (Karachi) prices of Pakistani basmati and IRRI rice:**	
	i) Basmati	2706
	▪ Sept, 2018	3032
	▪ 2017-18	
	ii) IRRI	
	▪ Sept, 2018	755
	▪ 2017-18	789
B.	**Domestic market prices of rice paddy During Oct-Dec 2017-18**	
	i) Basmati Punjab	1623
	ii) IRRI-6 Sindh	897
C.	**Cost of production at market level for 2017-18 Crops**	
	i) Basmati (Punjab)	1467
	ii) IRRI (Punjab)	911
	iii) IRRI (Sindh)	733

Recommendations

In view of the field information, consultations with the stakeholders in the API's Annual Committee meeting on rice paddy and analysis of the relevant factors, following recommendations are made regarding the intervention price and improving productivity, quality and marketing of rice paddy.

a. Intervention Price of Rice Paddy: 2018-19 Crop

i. In view of the relevant analysis and high input costs, the API is of the view that the Government may like to consider for announcement of Intervention Price for Rice paddy 2018-19 crop around Rs.1800 per 40 kgs for basmati and Rs.850 per 40 kgs for IRRI paddy, in case of need.

ii. It should provide remunerative margin of returns over the cost of production which would help Productivity Enhancement Programme of the Government through balanced input use, better management and optimal technology adoption.

iii. It provides a reference point for intervention by the public sector agency, if needed.

iv. The API strongly feels that greater attention and emphasis should be given by the government on improving quality of rice for boosting exports.

v. In view of free market and active role of private sector, the actual incentive to paddy growers should come through the market forces.

vi. The government policy of encouraging the role of private sector in marketing of rice may be further strengthened.

vii. The PASSCO should be designated as implementing agency for procurement of rice paddy at the intervention price if announced by the government.

viii. PASSCO equipped with pre-requisites for procuring rice paddy should enter well in time in the field keeping in view the harvesting times of rice (paddy) in different agro-ecological areas especially in Sindh province where the harvesting starts early.

b. Improving Productivity

i. Use of Certified seed should be encouraged. While approving the Hybrid Rice Varieties, the Provincial Seed Councils should also be kept on board. Unapproved varieties should be either got approved according to procedure or be banned.

ii. Government should put the hybrid seeds in the system by approval according to the proper procedure to avoid fluctuation in yield.

iii. Price of Hybrid seed should be rationalized. Inbred lines of Hybrid seed should be encouraged while importing seed. Extra vigilance should be exercised to control GMO paddy seed.

iv. Irrigation water is getting scarce over-time. The Research Institutes should make efforts for evolving varieties which consume less water. Research Institutes may also evolve technologies for dry sowing of rice.

v. Timely availability of fertilizer may be ensured at the time of crop sowing.

vi. To ensure quality of inputs especially, fertilizer and pesticides, Provincial Agriculture Departments may enhance monitoring by using mobile labs.

vii. To regulate the prices of fertilizer and avoid black marketing, retail price along with manufacturing and expiry date should be printed on fertilizer bags and the Provincial Agriculture Departments should ensure effective implementation of a strong monitoring system.

viii. To resolve the issue of non-availability of desired farm machinery, the Cooperative System should be encouraged for arranging farm machinery on rental basis to growers.

ix. To improve quality of rice for better price at farm gate, Portable dryers for small farmers may be introduced at subsidized rate.

x. Certified seed of IRRI-6, KS-282 and other high yielding varieties in sufficient quantity should be made available at reasonable prices.

xi. Provincial Agriculture Research Institutes/ NARC may be facilitated for production of local hybrid varieties, if economical.

xii. Prices of certified seed, both local/imported, should be strictly controlled at competitive level.

xiii. According to Rice Pest Control Act, rice nursery cannot be sown before May 20. This needs to be strictly implemented. This will facilitate in harvesting of monsoon rain water resulting in reduction of production cost.

xiv. Balanced use of fertilizers according to Agriculture Extension Department's recommendations should be advocated. Pure zinc sulphate should also be made available to growers.

xv. Pest Scouting activities should be strengthened through creating awareness and training. Indiscriminate use of pesticides should be avoided. Lesser use of pesticides will not only reduce cost of production but also resolve the issue of pesticide residual.

xvi. Majority of rice growers are small or medium farmers and unaware of Global GAP. To create awareness among farming community, awareness campaign should be launched by federal/ provincial governments.

xvii. To encourage the Breeder, awards should be insured for new HYV varieties.

c. Improving Quality and Marketing

i. Import as well as local manufacturing of rice harvesters need to be encouraged and should be provided to growers at subsidized rates to discourage premature harvesting of paddy.

ii. To improve quality of paddy, paddy dryers need to be installed at each rice mill through incentive by the public sector.

iii. Par boiled steaming of rice technology should be encouraged under the supervision of qualified technician for standardization of rice quality.

iv. Projects like Supply Chain System of the Punjab Government should be encouraged in other provinces also in collaboration with private sector for improving the quality and marketing of rice.

v. Although Crop Reporting Service (CRS) is efficiently working on yield estimation and crop production but is suffering from the shortage of employees, there is need of capacity building of the CRS and to provide conveyance to Crop Reporters and Statistical Officer for timely completion of crop estimates.

vi. The efficiency of CRS needs to be enhanced by providing mini threshers portable for crop yield estimation of rice crop.

vii. To safeguard the interest of farmers, India is providing substantial amount of subsidy in agriculture sector, as a result of which production cost of Indian rice is more competitive.

viii. If rice is eliminated from negative list of traded commodities with India, Pakistan cannot compete with India. So the rice should be mentioned in negative list.

ix. Processing units and warehouses of exporters may be got HACCP certified to meet international Food Laws.

x. Issue of Aflatoxin (fungal attack on rice) is surging. To overcome this issue, import of dryer and silos may be allowed at zero tariffs.

xi. To avoid Kapra Betal infestation, a separate location should be assigned in port area to avoid transfer of pest from wheat to rice.

xii. Rice should be stored in separate godowns. Use of used jute bags should be strictly banned. Poly propylene bags are more useful to avoid Kapra Betal infestation.

xiii. Rice godowns should be strictly monitored for sanitation on regular basis.

xiv. Fumigation of the rice consignment with methyl bromide and aspirator may be treated prior to shipment. Separator may also be used to separate the dead insect.

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RICE POLICY ANALYSIS FOR 2018-19

INTRODUCTION

Rice plays an assorted role in Pakistan's agrarian economy. It is second staple food and meets more than 2 million tonnes of national food requirement. Rice industry is an important source of employment and income for rural people. It also contributes in the country's foreign exchange earnings of the *exchequer*. Rice accounts for 3.1 percent of the value added in agriculture and 0.6 percent of GDP (Economic Survey 2017-18). The cropped area under rice is 2.900 million hectares. Rice production in the country consists of Basmati, IRRI and 'Other' varieties. All of them have sufficient export demand as well as they are consumed domestically.

2. Basmati is long grain aromatic variety entirely produced in the Punjab. Sindh leads in IRRI production and Punjab in 'Others' varieties production. However, rice is cultivated in all four provinces at varying levels of production. The crop also provides feed to livestock in the form of rice straw and husk. It is also used as a raw material for the manufacturing industry.

3. In Pakistan, rice is an important food as well as cash crop. After wheat, it is the second main staple food crop and second major exportable commodity after cotton. During 2017-18, are cultivated under rice crop has increased by 6.4 per cent to 2,899 thousand hectares compared to 2,724 thousand hectares of the corresponding period of last year. The production of rice reached historically high level of 7,442 thousand hectare tonnes against the production of 6,849 thousand tonnes and recorded an increase of 8.7 per cent over production of last year. Rice accounts for 3.1 per cent in the value added in agriculture and 0.6 per cent of GDP. Rice area increased due to higher domestic prices and availability of inputs on subsidies rates, good advisory along with increase in export, which made rice cultivation attractive for growers. The area, production and yield of rice in last five years (Pakistan Economic Survey 2017-18).

4. There is a dire need to protect Pakistani rice exports and invest in research, pest eradication, storage, improvement in yield, develop international demanded varieties and have to keep it up by having GAP (Good Agriculture Practise) certification at farm level. The efforts should be made that our rice markets remain intact.

2. SOWING & TRANSPLANTING OF RICE PADDY

5. Rice crop in Pakistan is mostly sown by transplanting of seedlings raised in nurseries. Direct seeding is also practised on a limited scale in areas where weed is not a problem. The 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	3rd week of May to end of June
Balochistan	All varieties	20 May to 30 June	20 June to 30 July

Sources:

i) For Punjab: Rice Research Institute, Kalashah Kaku.
ii) For Sindh: Rice Research Institute, Dokri, Sindh.
iii) For KPK and Balochistan: Rice Coordinator, NARC, Islamabad.

3. REVIEW OF 2018-19 CROP

3.1 Provincial Shares in Area and Production

6. Average annual production of rice during **2015-16 to 2017-18** worked out at 7.034 million tonnes from average area of 2.788 million hectares (6.890 million acres). Varietal break-up of rice production **(Table-2)** shows that Punjab having best suited agro climate conditions in

production of basmati rice is the sole producer of basmati in the country. In the total production of IRRI rice; Punjab, Sindh, and Balochistan are contributing 21.1, 49.6 and 29.2 per cent, respectively. In 'Others' varieties of rice, respective shares of Punjab, Sindh and Khyber Pakhtunkhowa are 26.4, 67.7 and 5.9 per cent.

Table-2: Average Percentage Share in Area and Production of Rice in Different Provinces: Average of the Period 2015-16 to 2017-18 Crops

Variety	Pakistan		Punjab	Sindh	KPK	Balochistan
Area (000 hectares)		**Per cent**	**----------Per cent----------**			
Total	**2788.0 (6889.7)**	**100.0**	64.1	27.5	2.3	6.2
Basmati	1341.1 (3314.0)	48.1	100.0	-	-	-
IRRI	673.4 (1664.0)	24.2	22.9	51.6	-	25.5
Other	773.6 (1911.6)	27.7	37.5	54.1	8.3	-
Production (000 tonnes)		**Percent**	**----------Per cent----------**			
Total	**7033.5**	**100.0**	51.5	38.3	2.2	8.0
Basmati	2540.1	36.1	100.0	-	-	-
IRRI	1916.3	27.2	21.1	49.6	-	29.2
Other	2577.1	36.6	26.4	67.7	5.9	-

Note: Figures in parenthesis are in thousand acres.
Source: Worked out from data in Annex-I

7. Provincial shares of Punjab, Sindh, Khyber Pukhtoonkhowa and Balochistan in area of rice are 64.1, 27.5, 2.3 and 6.2 per cent, respectively. Basmati carries 48.1 per cent of the total area while IRRI and 'Others' varieties are grown on 22.9 and 37.5 per cent of the area cultivated with rice. Province-wise and variety-wise shares in rice production are given in **Fig-1 and Fig-2.**

Fig-1: VARIETAL SHARES IN PRODUCTION OF RICE: AVERAGE OF 2015-16 TO 2017-18

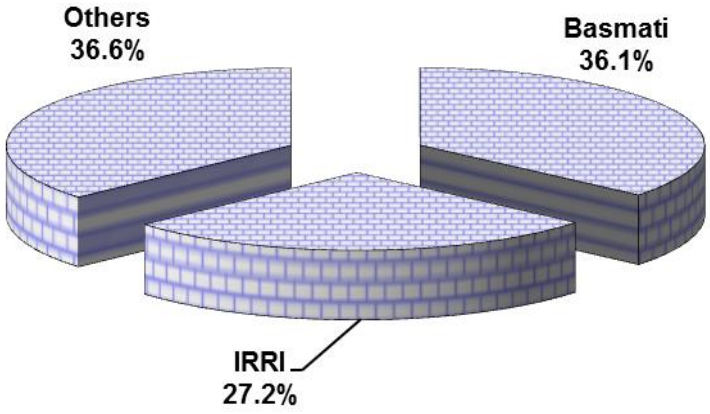
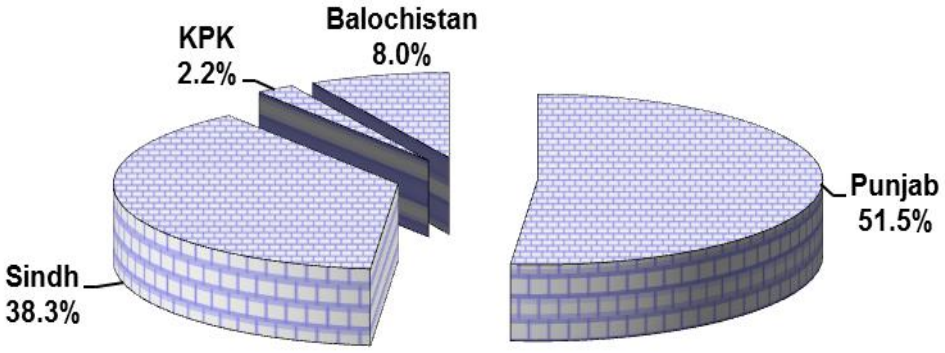


Fig-2: PROVINCIAL SHARES IN PRODUCTIN OF RICE: AVERAGE OF 2015-16 TO 2017-18



3.2 Important Rice Producing Districts

8. Districts producing more than 50 thousand tonnes of rice include Gujranwala, Okara, Sheikhupura, Hafizabad, Sialkot, Nankana Sahib, Bahawalnagar, Kasur, Pakpattan, M.B. Din, Narowal, Jhang, D.G. Khan, T.T. Singh, Chiniot, Muzaffargarh, Vehari, Lahore, Sahiwal, Sargodha, Gujrat, Khanewal, and Faisalabad from the Punjab, Badin, Larkana, Shikarpur, Jacobabad, Qamber, Kashmore, Thatta, Dadu and T.M. Khan from Sindh and Jafarabad and Nasirabad from Balochistan. These 34 districts collectively produced 94.6 per cent of total production of rice. Main basmati producer districts which contributes about 65.3 per cent of the total basmati are Gujranwala, Okara, Sheikhupura, Hafizabad, Sialkot, Nankana Sahib, Bahawalnagar, M.B. Din, Narowal and Jhang While 78.6 per cent of the total IRRI rice is contributed by Sheikhupura, Larkana, Qamber, Thatta, Badin, Shikarpur, Nasirabad and Jafarabad, these districts are above 100 thousand tonnes producers. Districts, based on 2015-16 to 2017-18 average, are arranged in descending order of rice production, with varietals break-up in **Annex-II.**

3.3 Changes in Area, Yield and Production

9. The area under rice crop during 2007-08 to 2017-18 has ranged between 2.308 and 2.900 million hectares (5.705 to 7.168 million acres) and production oscillated between 4.823 and 7.450 million tonnes **(Annex-I & I-A).** The yield during this period fluctuated between 2039 to 2568 kgs per hectare (885 to 1039 kgs per acre). Long and short terms changes in area, yield and production of rice are discussed below:

3.4 Long terms changes: 2007-08 to 2017-18

10. During the decade ending 2017-18, production of rice at country level is estimated to have increased @ 2.0 per cent per annum as a cumulative effect of increase in yield by 1.4 per cent and expansion in area by 0.6 per cent. The changes in area, yield and production by provinces and by variety-wise during 2007-08 to 2017-18 are given in Table-3.

Table-3: Average Annual Growth Rates of Area, Yield and Production of Rice: 2007-08 to 2017-18

Country/Province	Variety	Area	Yield	Production
		----------Per cent per annum----------		
Pakistan	**All varieties**	**0.6**	**1.4**	**2.0**
	Basmati	-0.7	1.0	0.3
	IRRI	-2.7	-0.7	-3.4
	Others	8.8	4.1	13.2
Punjab	**All varieties**	**-0.2**	**0.9**	**0.6**
	Basmati	-0.7	1.0	0.3
	IRRI	-2.3	0.6	-1.7
	Others	3.3	0.3	3.6
Sindh	**All varieties**	**3.2**	**0.7**	**4.0**
	IRRI	-3.9	-2.8	-6.6
	Others	18.6	6.0	25.7
KPK	**All varieties**	**1.3**	**2.3**	**3.7**
Balochistan	**All varieties**	**0.2**	**4.1**	**4.3**

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

11. Annual growth of rice production in the Punjab during the period 2007-08 to 2017-18 remained higher by 0.6 per cent as result of 0.9 per cent per annum increase in yield however 0.2 per cent per annum decrease in area. The production of basmati rice has increased by 0.3 per cent per annum, due to yield increase @ 1.0 per cent per annum, although Area decreased by 0.7 per cent per annum. Production of IRRI rice has decreased by 1.7 per cent annually due to 2.3 per cent per reduction in area however 0.6 per cent increased in yield. Production of 'Other' varieties has increased by 3.6 per cent per annum resultantly, 3.3 and 0.3 per cent expansion in area and yield respectively.

12. In Sindh, where only coarse varieties are cultivated, rice production during the period under reference is estimated to have increased @ 4.0 per cent annually due to 3.2 per cent expansion in area and 0.7 per cent rise in yield.

13. In the Khyber Pakhtun Khwa, the production of rice has increased by 3.7 per cent annually due to 1.3 and 2.3 per cent per annum increase in area and yield.

14. In Balochistan, rice production during the period under reference has recorded average annual expansion of 4.3 per cent due to also increase in area by 0.2 per cent and 4.1 per cent rise in yield.

3.5 Short-terms changes: 2016-17 vs 2017-18

15. According to the final estimates, rice production estimated at 7.450 million tonnes in 2017-18 is 8.8 per cent higher than last year's production of 6.849 million tonnes. Production has increased @ 8.8 per cent mainly based upon in the increases of area by 6.5 per cent and rises of yield by 2.1 per cent. The changes in area yield and production by province and by variety in 2017-18 in relation to 2016-17 are given in **Table-4**.

Table-4: Area, Yield and Production of Rice by Variety: 2016-17 and 2017-18 Crop

Country/ Pakistan	Area		Change	Yield		Change	Production		Change
	2016-17	2017-18		2016-17	2017-18		2016-17	2017-18	
	000 hectares		**Percent**	**Kgs/hectare**		**Percent**	**000 tonnes**		**Percent**
Pakistan	**2724.0**	**2900.6**	**6.5**	**2514.4**	**2568.4**	**2.1**	**6849.3**	**7449.8**	**8.8**
Basmati	1352.8	1416.4	4.7	1866.1	1988.6	6.6	2524.4	2816.6	11.6
IRRI	648.7	656.2	1.2	2892.1	2734.8	-5.4	1876.1	1794.6	-4.3
Others	722.5	828.0	14.6	3389.2	3428.3	1.2	2448.8	2838.6	15.9
Punjab	**1736.5**	**1840.9**	**6.0**	**2001.2**	**2117.4**	**5.8**	**3475.0**	**3898.0**	**12.2**
Basmati	1352.8	1416.4	4.7	1866.1	1988.6	6.6	2524.4	2816.6	11.6
IRRI	145.3	134.8	-7.2	2696.5	2689.2	-0.3	391.8	362.5	-7.5
Others	238.4	289.7	21.5	2344.0	2481.5	5.9	558.8	718.9	28.7
Sindh	**750.5**	**828.3**	**10.4**	**3546.3**	**3441.4**	**-3.0**	**2661.6**	**2850.5**	**7.1**
IRRI	333.4	351.6	5.5	2788.8	2498.0	-10.4	929.8	878.3	-5.5
Others	417.1	476.7	14.3	4151.8	4137.2	-0.4	1731.8	1972.2	13.9
KPK	**67.0**	**61.6**	**-8.1**	**2361.2**	**2394.5**	**1.4**	**158.2**	**147.5**	**-6.8**
Balochistan	**170.0**	**169.8**	**-0.1**	**3261.8**	**3261.5**	**0.0**	**554.5**	**553.8**	**-0.1**

Source: Annex-I.

16. In the Punjab, overall production of rice has shown increase of 12.2 per cent during 2017-18 as compared to 2016-17. The increase in production occurred mainly because of increase in area and yield by 6.0 and 5.8 per cen. Production of basmati increased by 11.6 percent because of increase in area by 4.7 per cent and 6.6 per cent in yield. IRRI varieties have shown a decrease of 7.5 per cent in production due to decrease by 7.2 per cent in area and 0.3 per cent decrease in yield. Production of 'Other' rice has increased by 28.7 per cent mainly because of increase 21.5 and 5.9 per cent in area and yield.

17. In Sindh, overall production of rice has increased by 7.1 per cent mainly due to increase in area by 10.4 per cent whereas yield decreased by 3.0 per cent compare to the last year. Production of IRRI decreased by 5.5 mainly due to decrease in yield by 10.4 per cent although area increased by 5.5 per cent. Production of "Others" rice has increased by 13.9 per cent due to increase in area by 14.3 per cent and yield decreased slightly by 0.4 per cent.

18. In the Khyber Pakhtunkhowa rice production decreased by 6.8 percent due to decrease in area by 8.1 per cent although yield increased by 1.4 per cent as compared to 2016-17 crop.

19. In Balochistan, where IRRI varieties of rice are grown, and production of rice has decreased by 0.1 per cent due to decrease in area by 0.1 per cent in 2017-18 as compared to 2016-17.

3.6 Targets Vs Achievements: 2017-18 Crop

20. The Federal Committee on Agriculture (FCA) meeting held on 14-09-2015 in Islamabad has fixed rice area and production target for 2017-18 crop at 2.786 million hectares and 6.818 million tonnes. As per final estimates provided by Provincial Agricultural Departments, the area and production estimated at 2.900 million hectares and 7.450 million tonnes, higher than the target by 4.1 and 9.3 per cent respectively **(Table-5).**

Table-5: Targets and Estimated Achievements of Area, Yield and Production of Rice: 2017-18 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		Percent	kgs per hectare		Percent	000 tonnes		Percent
Pakistan	**2786.0**	**2900.6**	**4.1**	**2447.2**	**2568.4**	**4.9**	**6818.0**	**7449.8**	**9.3**
Punjab	1800.0	1840.9	2.3	1944.4	2117.4	8.9	3500.0	3898.0	11.4
Sindh	750.0	828.3	10.4	3466.7	3441.4	-0.7	2600.0	2850.5	9.6
KPK	61.0	61.6	1.0	2360.7	2394.5	1.4	144.0	147.5	2.4
Balochistan	175.0	169.8	-3.0	3280.0	3261.5	-0.6	574.0	553.8	-3.5

Sources:

1. For targets: Minutes of the Federal Committee on Agriculture (FCA) meeting held on 14-09-2017 in Islamabad.
2. For achievements: Annex-I.

21. Area targets have been over achieved in the Punjab, Sindh, and KPK by 2.3, 10.4 and 1.0 per cent respectively while in Balochistan it remained under achieved by 3.0 per cent. Production of Punjab, Sindh, and KPK also remained higher the target by 11.4, 9.6 and 2.4 per cent respectively while production in Balochistan remained below the target by 3.5 per cent. Yield of Punjab and KPK has surpassed the target by 8.9 and 1.4 per cent respectively but in the Sindh and Balochistan remained below the target by 0.7 and 0.6 per cent respectively. Targets and achievements of area, yield and production of rice by provinces and varieties are depicted in **Fig-3 and Fig-4.**

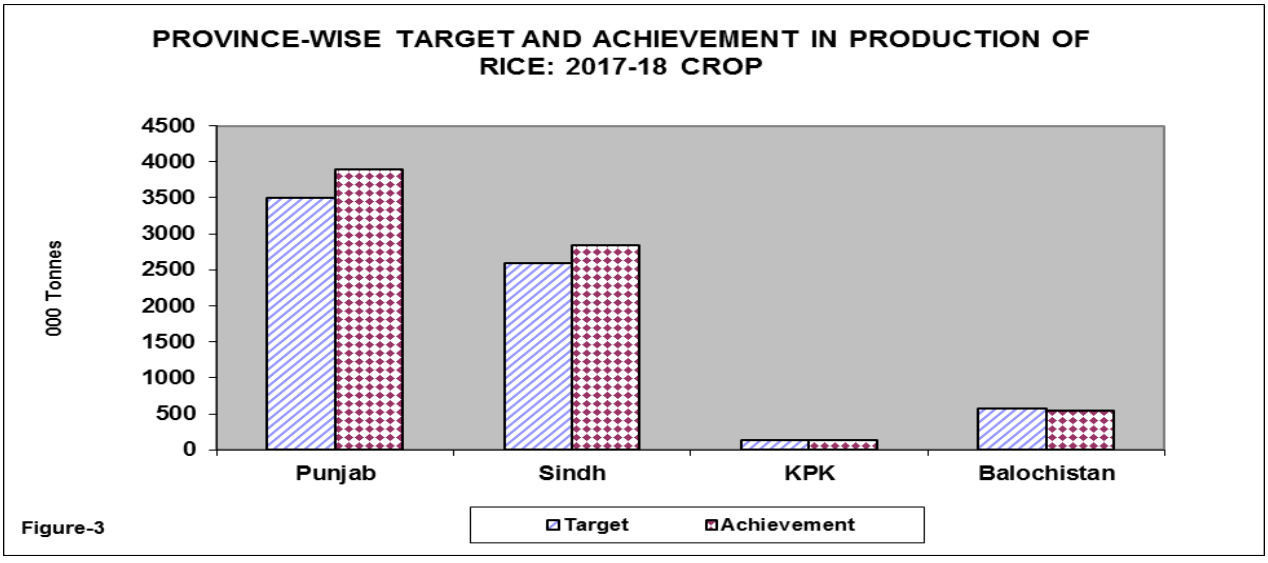


Figure-3

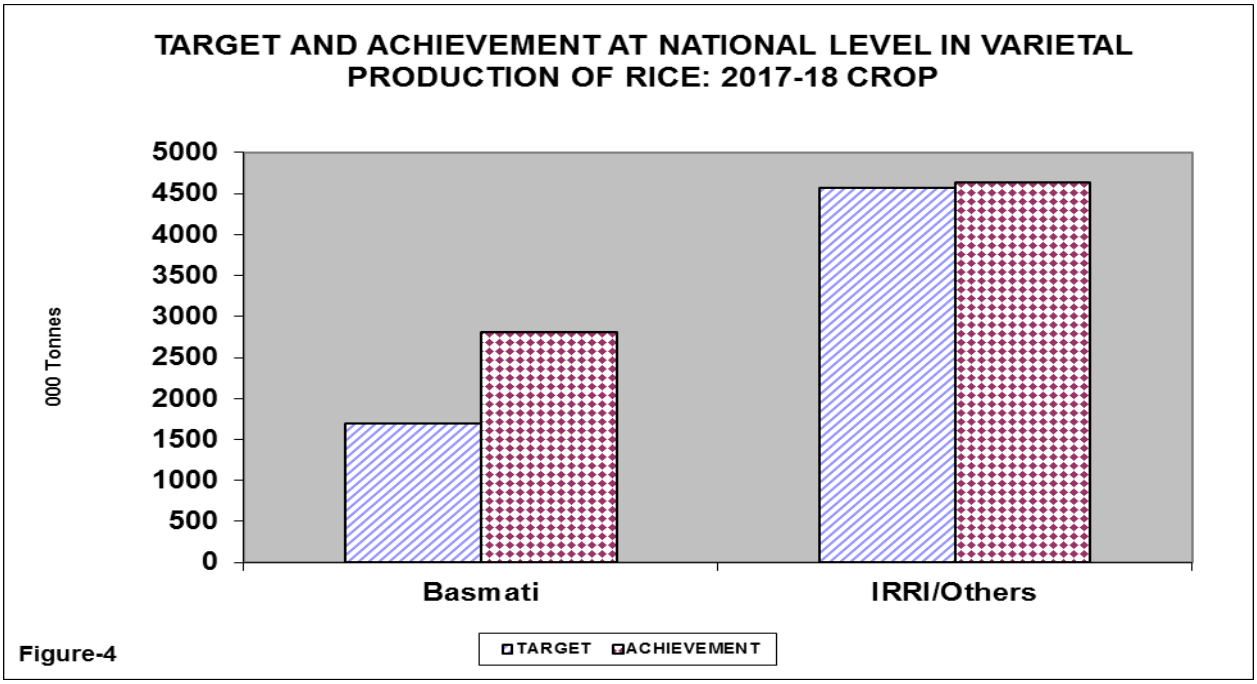


Figure-4

4. DOMESTIC DEMAND, SUPPLY AND PRICE SITUATION OF RICE

4.1 Domestic Demand and Supply of Rice

22. Based on annual per capita availability of rice averaging at 12.89 kgs during the period 2014-15 to 2016-17 (Annex-III), the domestic consumption requirement in 2017-18 for population of 210.69 million has been estimated at 2714 thousand tonnes. Against this requirement, total production of rice in the country from 2017-18 crop has been reported at 7450 thousand tonnes. Taking the allowance for seed and wastage @ 6 per cent of the production (447 thousand tonnes), the net available rice for consumption and trade comes to 7003 thousand tonnes. Thus Pakistan has an export surplus of 4289 thousand tones, after accounting for domestic requirement of 2714 thousand tones during 2017-18.

4.2 Domestic Prices of Rice Paddy

23. The wholesale market prices of basmati paddy as presented in Table-6 have ranged between Rs 1876 per 40 kgs in Arifwala market during December 2017 and Rs 1400 per 40 kgs

in Sheikhupura market during Oct 2017. The seasonal average prices of basmati in the Punjab have ranged between Rs 1479 and Rs 1706 per 40 kgs.

Table-6: Monthly Average Wholesale Prices of Basmati Paddy in Major Producer Area Markets of the Punjab: 2017-18 crop

Markets	Oct	Nov	Dec	Average
	----------Rupees per 40 kgs.----------			
Hafizabad	1500	1493	1613	**1535**
Gujranwala	-	1562	1613	**1587**
Narowal	-	1647	1765	**1706**
Kasur	-	1602	1763	**1682**
Sialkot	1500	1560	1831	**1630**
Chiniot	1543	1484	1611	**1546**
Sheikhupura	1400	1510	1527	**1479**
Okara	1540	1609	1739	**1630**
M.B. Din	1525	1515	1740	**1593**
Arifwala	1500	1635	1876	**1670**
Vehari	-	1639	1733	**1686**
Pakpattan	1486	1590	1872	**1649**
Sahiwal	-	1566	1687	**1626**
Nankana Sahib	-	1602	1797	**1699**
Average	**1499**	**1572**	**1726**	**1623**

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

24. The monthly average wholesale market prices of IRRI Paddy in different markets of Punjab and Sindh are presented in **Table-7**. The market price in Punjab ranged between Rs 754 in Vehari market during November 2017 and Rs 827 in Arifwala market during November 2017.

25. Like, Punjab, the average whole sale price of IRRI-6 paddy ranged between Rs 840 in Kashmore-Kandh Kot market during December 2017 and Rs 948 in Dadu market during November 2017.

Table-7: Monthly Average Wholesale Prices of IRRI-6 Paddy in Major Producer Area Markets of the Punjab and Sindh during 2017-18

Markets	Oct	Nov	Dec	Average
Punjab				
Pakpattan	800	796	--	**798**
Arifwala	804	827	--	**815**
Vehari	--	754	--	**754**
Average	**802**	**792**	--	**797**
SINDH				
Badin	910	917	--	**914**
Tando Mohammad Khan	917	925	900	**914**
Thatta	896	917	--	**907**
Dadu	905	948	920	**924**
Larkano	900	918	900	**906**
Shikarpur	875	895	890	**887**
Jacobabad	850	905	905	**887**
Kashmore-Kandh Kot	880	870	840	**863**
Qambar-Shahdad Kot	850	890	900	**880**
Average	**887**	**909**	**894**	**897**

Source: Market Committees, Sindh.

5. COST OF PRODUCTION OF RICE PADDY

26. The cost of production (COP) is one of the important factors in making price suggestion for farm commodities. However, its empirical estimation involves a number of intangible problems and practical difficulties. Wide variations in the use level of inputs, technology adoption and diverse farming resulting in varying yield levels further add to the problem.

27. The cost of production estimates in the Punjab and Sindh for various varietals groups of rice paddy for the 2018-19 crop have been updated by adopting the input-output parameters as used in the Price Policy Report for Rice Paddy, 2017-18 crop in conjunction with the latest prices and rates of field operations. The prices of inputs and custom hiring rates of field operations were updated with the information provided by the participants in the meeting of API's Standing Committee Meeting, held on 2017 at Islamabad and mini field surveys conducted by the API in the important rice growing areas o f the Punjab and Sindh during Jan-Feb 2016. The COP estimates for rice paddy for the Punjab and Sindh are detailed in **Annex-IV to VI**, while the summary of these is shown in **Table-8.**

5.1 Average Farmers' Cost of Production of Rice Paddy: 2017-18 and 2018-19 Crops

28. The expected cost of production estimates of basmati and IRRI in the Punjab and IRRI in Sindh during 2017-18 and 2018-19 crops are summarized and presented in Table- below.

Table-8: Average Farmers' Cost of Production of Rice Paddy: 2017-18 and 2018-19 Crops

Item	Unit	Cost estimates		Increase in 2018-19 over 2017-18
		2017-18 crop	2018-19 crop	
Punjab	**Basmati**			
1. Net cost of cultivation	Rs/acre	42499	48924	6424
2. Yield	Kgs/acre	1200	1200	-
3. Cost of production at farm level	Rs/40 kgs	1417	1631	214
4. Marketing cost i.e. loading, transport, commission etc.	"	50	50	-
5. Cost of production at market level	"	1467	1681	214
	IRRI			
1. Net cost of cultivation	Rs/acre	38718	43963	5245
2. Yield	Kgs/acre	1700	1700	-
3. Cost of production at farm level	Rs/40 kgs	911	1034	123
4. Marketing cost i.e. loading, transport, commission etc.	"	50	50	-
5. Cost of production at market level	"	961	1084	123
Sindh	**IRRI**			
1. Net cost of cultivation	Rs/acre	37538	41339	3802
2. Yield	Kgs/acre	2200	2000	-200
3. Cost of production at farm level	Rs/40 kgs	683	827	144
4. Marketing cost i.e. loading, transport, commission etc.	"	50	50	-
5. Cost of production at market level	"	733	877	144

Source: Annex-IV to VI.

Punjab

- Basmati

29. The cost of growing one acre of basmati paddy at the current inputs prices and custom hiring rates in the Punjab, during 2018-19 crop year is anticipated at Rs 48924, inclusive of land rent. Based on the average yield of 1200 kgs per acre, the farm level cost of production works out to Rs 1631 per 40 kgs. Adding marketing cost @ Rs 50 per 40 kgs, the cost of production to

harvest and deliver the rice paddy at the market/sheller level would be Rs 1681 per 40 kgs, greater by Rs 214 per 40 kgs (14.6 per cent) of the last year's corresponding cost estimated at 1467 per 40 kgs.

- **IRRI**

30. The likely cost of cultivating one acre of IRRI paddy in the Punjab during 2018-19 is outlined at Rs 43963, inclusive of land rent. The farm level cost of production comes to Rs 1034 per 40 kgs, basing on the average yield of 1700 kgs per acre. Taking into account marketing charges @ Rs 50 per 40 kgs, the cost of IRRI paddy at the market/sheller level would be Rs 1084 per 40 kgs, higher by Rs 123 per 40 kgs (12.8 per cent) the corresponding cost estimates of the 2017-18 crop of Rs 961 per 40 kgs.

- **Sindh**

31. In Sindh, cultivating one acre of IRRI paddy during 2018-19 crop's year is expected to cost at Rs 41339, inclusive of land rent. Based on average yield of 2000 kgs per acre, the cost of production at farm level would be Rs 827 per 40 kgs. Taking marketing expenses @ Rs 50 per 40 kgs, the cost of produce to deliver at sheller/market would be Rs 877 per 40 kgs, exceeding the corresponding cost of Rs 733 per 40 kgs of the 2017-18 crop by Rs 144 (19.7 per cent).

32. The intensification in COP of rice paddy in both provinces have been mainly on account of higher prices of fertilizer, pesticides, weedicides and land rental charges. However, depressed market prices of rice paddy as kind payment for harvesting, threshing etc and increase in value of paddy straw have partially off set the increase in the cost of rice production in both provinces.

5.2 Cost of Major Operations/Inputs

33. The breakup of various field operations and farm inputs in the total cost of cultivation of rice paddy in the Punjab and Sindh during 2017-18 and 2018-19 crops along-with percentage changes therein is presented in **Table-9**.

Table-9: Cost of Major Operations/inputs of Rice Paddy: 2017-18 and 2018-19 Crops

Operations/inputs	2017-18 Crop	2018-19 Crop	Shares in increased cost
	(Rs/acre)		(Per cent)
Punjab	**Basmati**		
1. Land preparation	3962 (9)	4740 (10)	12
2. Nursery/uprooting and transplanting	5577 (13)	7034 (14)	23
3. Weeding	460 (1)	518 (1)	1
4. Plant protection	535 (1)	571 (1)	1
5. Irrigation	9089 (21)	9921 (20)	13
6. Fertilizer including FYM	4769 (11)	5693 (12)	14
7. Land rent	11500 (27)	13500 (28)	31
8. Harvesting and threshing etc	2800 (7)	3000 (6)	3
9. Others	3808 (9)	3947 (8)	2
10. Total cost	42499 (100)	48924(100)	100
1. Land preparation	3962 (10)	4740 (11)	15
2. Nursery/uprooting and transplanting	4583 (12)	4898 (11)	6
3. Weeding	535 (1)	602 (1)	1
4. Plant protection	702 (2)	783 (2)	2
5. Irrigation	6149 (16)	6655 (15)	10
6. Fertilizer including FYM	4850 (13)	5819 (13)	18
7. Land rent	11500 (30)	13500 (31)	38
8. Harvesting and threshing etc	2800 (7)	3000 (7)	4
9. Others	3636 (9)	3966 (9)	6
10. Total cost	38718 (100)	43963 (100)	100
Sindh	IRRI		
1. Land preparation	4363 (12)	4875 (12)	13
2. Nursery/uprooting and transplanting	4500 (12)	6700 (16)	58
3. Weeding	974 (3)	974 (2)	0
4. Plant protection	379 (1)	436 (1)	1
5. Irrigation	2725 (7)	2784 (7)	2
6. Fertilizer including FYM	4497 (12)	5621 (14)	30
7. Land rent	10000 (27)	12500 (30)	66
8. Harvesting and threshing etc	3200 (9)	3500 (8)	8
9. Others	6900 (18)	3950 (10)	-78
10. Total cost	37538 (100)	41339 (100)	100

Notes: 1. Others include mark-up, management, land tax, land revenue and drainage cess.
2. Figures in parenthesis are percent shares in total cost of cultivation.
3. Rounding off figures may result in a slight difference.

Punjab

- Basmati

34. In the Punjab, land rent and irrigation are the significant components of the total cost of cultivation of basmati paddy for 2018-19 crop, accounting for 28 and 20 per cent respectively.

The other major constituents are: Nursery and related operation (14%), FYM including Fertilizers (12%), land preparation (10%) and Other Costs including bund making (8%).

- **IRRI**

35. During 2018-19 crop year, land rent is the leading component of the cost of cultivation of IRRI paddy in the Punjab, accounting for 31 per cent. The other chief constituents are: Irrigation (15%), Fertilizer including FYM (13%), land preparation and Nursery and related operations (11% each) and Harvesting/threshing (9%).

Sindh

36, The land rent is the core component of the cost of cultivation of IRRI paddy during 2018-19 crop year in Sindh, contributing 30 per cent. The other chief components are: Nursery and related operations (16%), Fertilizers including FYM (14%), land preparation (12%), Other Costs including bund making (10%) and Harvesting/threshing operations (8%).

6. ECONOMICS OF RICE PADDY AND COMPETING CROPS

37. 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.

38. The economics of rice and competing crops has been analyzed in terms of input-output prices paid and received by the growers for the 2017-18 crops. A summary of the relevant economic indicators emerging from the analysis is presented in Table-10 for the Punjab and Table-11 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

Punjab:

39. Basmati's performance in Punjab in terms of returns to overall investment has been 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 cotton.

Table- : Economics of Rice and Competing Crops at Prices Realized by the Growers in the Punjab: 2017-18 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	1.09	2.42	267	828
2. IRRI paddy	0.91	2.17	199	578
3. Seed Cotton	1.15	3.53	249	2717
4. Basmati+wheat	1.09	3.00	256	1316
5. Basmati+sunflower	1.07	2.54	265	1191
6. IRRI+wheat	1.00	2.92	222	1080
7. IRRI+sunflower	0.98	2.43	231	989
8. Sugarcane	1.18	5.12	238	1953

Source: Annex- .

40. 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. Not only that both Basmati and IRRI paddy were out performed by seed cotton, the IRRI even couldn't gain break-even and its returns to overall investment i.e. output-input ratio, was below than 1, which indicates that farmer's cost could not be met in cultivating IRRI paddy.

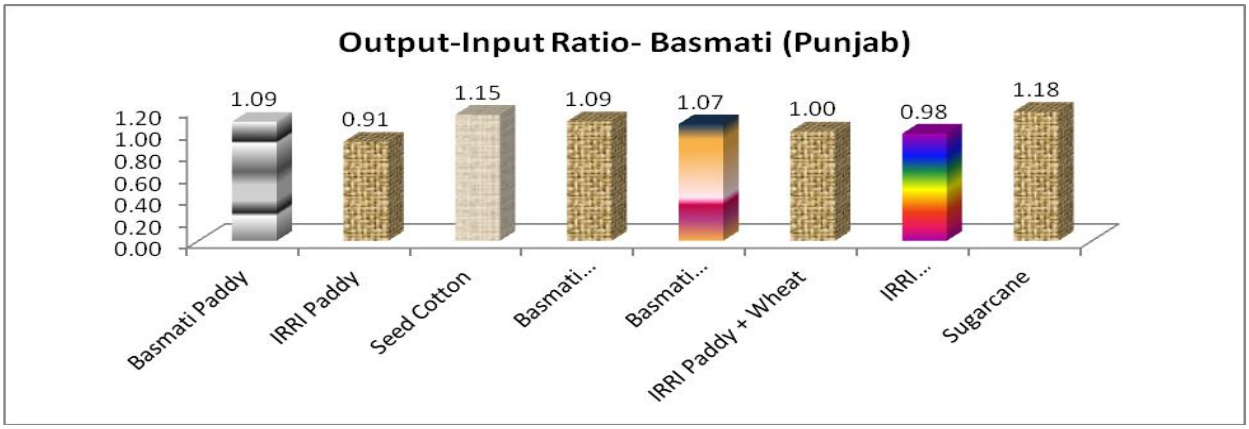


Fig-5: Output-input Ratio in Punjab for Basmati Paddy

41. 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 indicative price, performed much better against the earlier in terms of all the indicators including purchased inputs and irrigation water, but lagged behind Basmati combinations in terms of crop duration. IRRI combinations remained considerably lower in respect of all the economic indicators analyzed. The IRRI combination with Wheat gained a marginal edge over Sunflower combinations in terms of returns to purchased inputs. IRRI along with sunflower could not pay back to the farmer even the cost of cultivation, as the returns of overall investment remained below 1.

Sindh

42. In Sindh, IRRI paddy farming has shown relatively better results particularly in terms of output-input ratio, However remained below its main competitor - cotton crop. In terms of entire criteria, IRRI could not match or compete the Cotton (Table-11).

Table-11 : Economics of IRRI Paddy and Competing Crops at Prices Realized by the Growers in Sindh: 2017-18 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	1.30	3.91	262	843
2. Seed Cotton	1.35	4.49	308	4104
3. IRRI+wheat	1.20	3.84	246	1303
4. IRRI+sunflower	0.96	2.63	213	983
5. Sugarcane	1.17	4.61	246	1689

Source: Annex-VII .

43. In context of indirect competition with sugarcane, the economic position of IRRI+ wheat rotation is healthier than sugarcane in terms of returns to overall investment i.e output-input ratio. However, the performance of IRRI + sunflower combination has been significantly lower to the sugarcane in terms of overall investment and the remaining indicators.

44. This situation turns around if the economic analysis is carried out on the basis of actual prices received by the sugarcane growers, wherein sugarcane drops to the lowest against IRRI combinations in larger part of the economic criteria like output-input ratio (0.88) and crop duration (184).

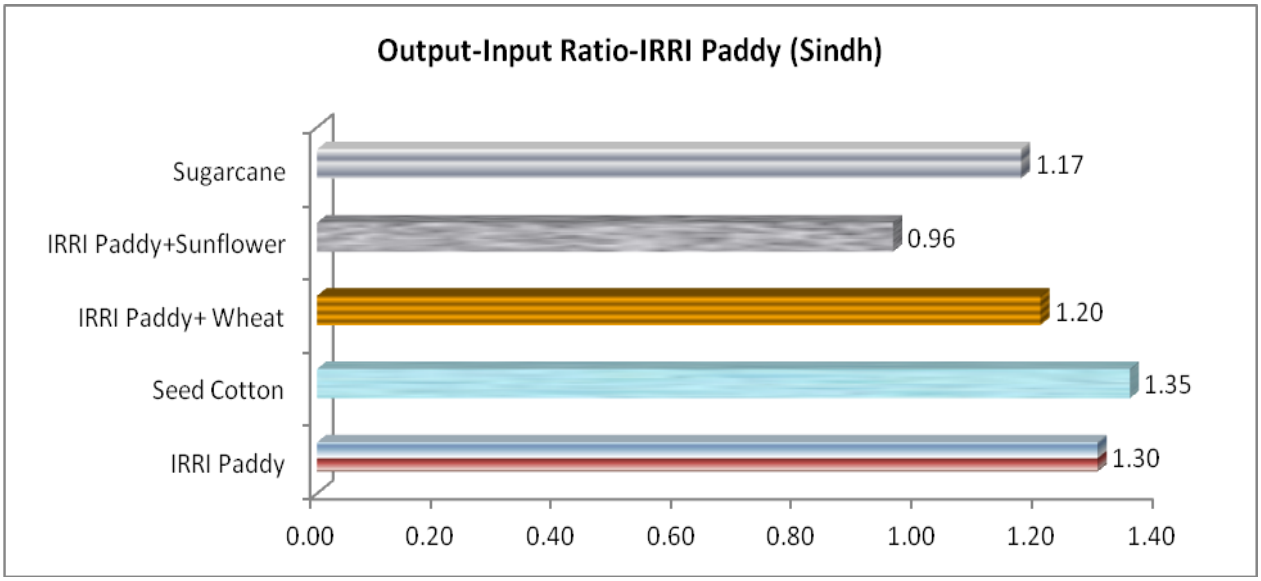


Fig-6: Output-input Ratio in Sindh for IRRI Paddy

7. NOMINAL AND REAL MARKET PRICES OF BASMATI AND IRRI PADDY: 2007-08 to 2017-18

45. 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 2007-08 to 2017-18 crops were deflated by the Consumer Price Index (CPI), the most common measures of inflation in the economy. The results are given in Table-12 and also depicted in **Figs-7 and 8**.

Table-12: Nominal and Real Market Prices of Basmati and IRRI-6 Paddy: 2007-08 to 2017-18

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		2000-01=100	Rs per 40 kgs	
2007-08	920	509	100.00	920	509
2008-09	1183	585	117.03	1,010	499
2009-10	1097	666	128.85	851	516
2010-11	1325	935	146.45	904	638
2011-12	1424	798	162.57	875	490
2012-13	1653	875	174.53	947	501
2013-14	2260	890	189.58	1,192	469
2014-15	1444	828	198.69	727	417
2015-16	1320	713	203.25	649	351
2016-17	1557	832	212.29	733	392
2017-18	1604	898	219.01	732	410

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, 2017-18.
ii) Directorate of Agriculture, (E&M), Lahore, Punjab.
iii) Directorate of Agriculture Farms and Major Crops Development, Hyderabad, Sindh.

46. 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.

i) Basmati Paddy (Punjab)

47. The data in Table-12 indicate exposes that the nominal market price of Basmati paddy has evidenced 74 per cent overall increase against the base year during the period under review while its real value decreased by 20 per cent. The major reason for this slow decline trend in the real purchasing power of the crop is the 119 per cent general inflation observed in the economy during the same period.

48. For the entire period under review, the real market price remained above the base year level for three times only for example 2008-09, 2012-13, 2013-14. The nominal market prices were showing increase of 3 per cent in 2017-18, as compared to the last year. The declining trade in global markets has impacted on price of the produce adversely and farmers are not getting appropriate prices for their produce, thus losing the productivity in long term and shortage of the expected crop ignited a price hike in the local market.

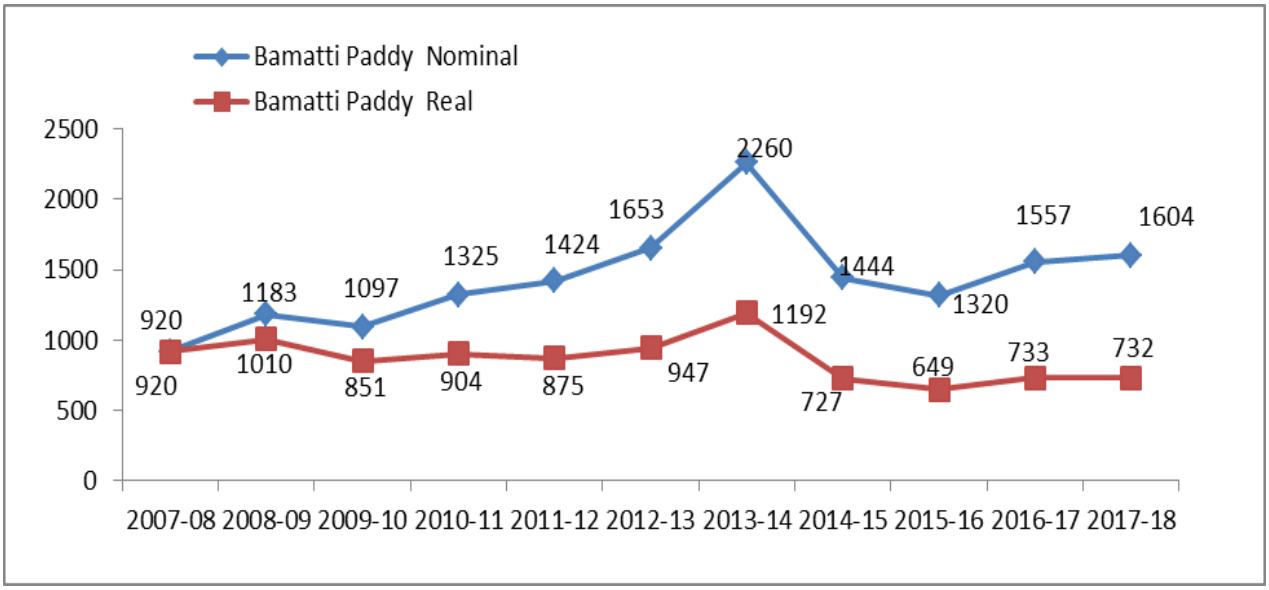


Fig-7: Nominal and Real Market price of Basmati Paddy in the Punjab: 2007-08 to 2017-18

ii) IRRI Paddy (Sindh)

49. It may be seen from Table-12, that the nominal market price of IRRI paddy in Sindh averaging at Rs 509/- per 40 kgs during the post-harvest season of 2007-08 has increased to Rs 898/- per 40 kgs in 2017-18, indicating overall increase of 76 per cent. For the rise in CPI by 119 per cent, the consequent decrease in the real market price of IRRI paddy is estimated at 19 per cent from Rs 509/- in base year to Rs 410/- per 40 kgs in 2017-18.

50. The data also reveal that during the whole period in question, the real market prices of IRRI paddy evidenced fluctuation. However, the year 2010-11 was the best crop season for rice growers as they received the highest real price of Rs 638/- per 40 kgs. However, during 2017-

18, the real price slightly downs the base year level. The real value of the crop remained below the base year level throughout the period under review except 2009-10 and 2010-11. In aggregate, the IRRI rice acreage fell down in this year over the previous year.

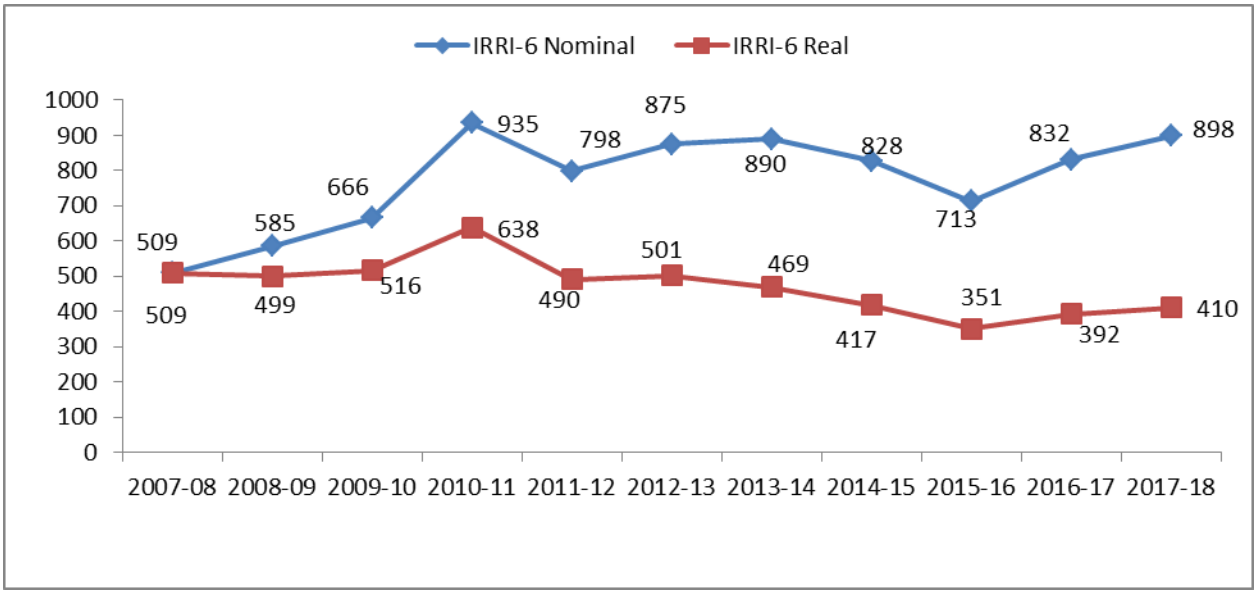


Fig-8: Nominal and Real Market price of IRRI-6 Paddy in the Sindh: 2007-08 to 2017-18

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

8.1 World Supply, Demand, Stocks, and Trade Situation

51. The data regarding the world balance sheet of rice from 2016-17 to 2018-19 are presented in **Table-13.**

52. The world production of rice in 2017-18 is estimated at 489.79 million tonnes, 2.9 million tonnes or (0.6 per cent) higher than that in 2016-17. Adding the opening stocks of 123.18 million tonnes, total supply works to 612.97 million tonnes (0.62 per cent) higher than in 2016-17.

53. Rice production in 20181-19 is forecast to increase to 490.78 million tonnes, 0.99 million tonnes higher than in 2017-18. With the addition of opening stocks of 125.66 million tonnes, total supply is expected at 616.46 million tonnes, 3.49 million tonnes higher than in 2017-18 due

to significant increase in opening stock. The global consumption is forecast to rise from 487.35 million tonnes in 2017-18 to 616.46 million tonnes in 2018-19. The end year stocks have decreased to 124.35 million tonnes. However, the global trade in rice reported at 48.11 million tonnes in 2017-18 is forecast to remain at 48.77 million tonnes in 2018-19. Due to persistent increase in stocks, the prices might same.

Table -13: World Supply, Demand, Stocks and Trade in Rice: 2016-17 to 2018-19

S.No	**Item**	**2016-17**	**2017-18 Estimate**	**2018-19 Forecast**
		----------Million tones----------		
1.	Opening stocks	122.33	123.18	125.68
2.	Production	486.89	489.79	490.78
3.	Total supply (Items 1+2)	609.22	612.97	616.46
4.	Consumption/disappearance	486.11	487.35	492.1
5.	Closing stocks	123.11	125.62	124.36
6.	Trade	47.7	48.11	48.77

Source: International Grain Council, Market Report Oct, 2018.

8.2 Export Parity Prices of Rice Paddy

54. 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 presented in **Annexes-VIII and IX** and a summary has been provided in **Table-14**

Table-14: Export Parity Prices of Basmati and IRRI Paddy

Items	Sep 2018	2017-18	Average 2014-17
A) Export Parity Price of Basmati Paddy			
Average fob Karachi prices of rice (US$/ton)	995	1106	952
Exchange Rate (Rs/US$)	132	132	132
Average fob Karachi prices of rice (Rs/40Kgs)	5254	5839	5026
Mill-gate price of rice paddy (Rs/ 40 kgs)	2706	3032	2579
B) Export Parity Price Of IRRI Paddy			
Average fob (Karachi) prices of rice (US$/ton)	348	362	347
Exchange Rate (Rs/US$)	132	132	132
Average fob Karachi prices of rice (Rs/40Kgs)	1839	1909	1834
Mill-gate price of rice paddy (Rs/40 kgs)	755	789	752

9. RICE EXPORT FROM PAKISTAN

55. Pakistan has been a major exporter of rice with its share in global trade at 8.5 per cent during 2017-18. Export of basmati rice has increased by 16.54 per cent in 2017-18 over 2016-17, while the export of course rice has increased by 10.97 per cent **(Table-15).**

Table-: 15 Per Cent Change in Export of Basmati and Coarse Rice in 2017-18 Over 2016-17

Region	Quantity		Value		% share in total export			
	Basmati Rice	Coarse Rice	Basmati Rice	Coarse Rice	Basmati Rice		Coarse Rice	
	----------percent change----------				2016-17	2017-18	2016-17	2017-18
Asia	-23.72	17.78	-17.69	37.00	68.73	43.85	44.44	42.46
Oceania	-7.45	3.40	11.53	-8.32	3.32	2.57	0.10	0.09
Europe	221.91	-39.95	229.26	-27.72	16.16	43.49	7.86	3.83
Africa	7.50	39.11	17.07	40.28	5.90	5.31	47.29	53.36
America	-2.88	2.41	15.19	-7.68	5.88	4.78	0.31	0.26
Total	19.57	23.27	28.32	32.17	100.00	100.00	100.00	100.00
CIS	-2.88	-87.34	-7.94	-87.45	8.42	5.36	55.46	5.70

Source: Annex- X

56. The table- 15 reveals that total export of basmati rice increased by 19.57 per cent in 2017-18 over 2016-17. The 221.91 per cent of Pakistani Basmati destined to Europe and 7.50 per cent to Africa is more to last year. While 23.72, 7.45, 2.88 and 23.81 per cent declined towards Asia, Oceania, America and CIS respectively. The total export of coarse rice has expanded by 23.27 per cent in 2017-18 against the last year. The export of coarse rice improved by 17.78, 3.40, 39.11 and 2.41 per cent to Asia, Oceania, Africa and America respectively. While it declined by 39.95 and 87.34 per cent to Europe and CIS countries in 2017-18 over the last year. Pakistan has improved its export of course rice to African countries significantly during 2017-18.

10. ECONOMIC EFFICIENCY IN RICE PRODUCTION

57. 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 2011-12 through 2017-18. The NPC, EPC and DRC estimates are produced in **Table-16** and background analyses given in **Annex XI to XIII.**

10.1 Nominal Protection Coefficient (NPC) under Export Situation

58. 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.

59. The NPC, EPC and DRC coefficients are separately calculated for Basmati and IRRI varieties of rice and produced in **Table-16**.

Table-16: Economic Efficiency Coefficients for Rice in Pakistan under Export Situation

Province/ Year	NPC	EPC	DRC	Resources spent to earn Forex US $ 1	US$ 1 = Pak Rs
Punjab					
Basmati					
2011-12	0.67	0.66	0.52	46.51	89.24
2012-13	0.99	1.13	0.62	60.25	96.72
2013-14	1.09	1.28	0.63	65.25	102.86
2014-15	0.61	0.56	0.68	69.16	101.00
2015-16	0.42	0.30	0.81	84.69	104.24
2016-17	0.59	0.52	0.52	54.30	104.68
2017-18	0.79	0.79	0.05	5.77	109.84
IRRI					
2011-12	0.76	0.63	0.52	46.56	89.24
2012-13	1.18	1.16	1.14	110.47	96.72
2013-14	1.24	1.24	1.29	132.98	102.86
2014-15	1.20	1.16	1.45	146.42	101.00
2015-16	1.27	1.26	2.23	232.15	104.24
2016-17	1.29	1.27	1.76	184.48	104.68
2017-18	1.08	1.01	0.94	103.52	109.84
Sindh					
IRRI					
2011-12	0.66	0.57	0.35	31.58	89.24
2012-13	1.18	1.17	0.71	68.34	96.72
2013-14	1.23	1.23	0.84	86.00	102.86
2014-15	1.20	1.19	0.96	96.73	101.00
2015-16	1.30	1.49	1.54	160.69	104.24
2016-17	1.64	1.91	1.25	130.48	104.68
2017-18	1.21	1.25	0.75	81.94	109.84

60. It is observed from the data in the above **Table** that for Basmati (Punjab), NPC values are less than one throughout the analysis period except 2013-14. It indicates that Basmati prices are not stable.

61. 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.

62. The NPC data in the referred Table reflect that Basmati growers in Pakistan have been implicitly taxed. This situation discourages development of the crop. However, NPC value for 2013-14 is above one which implies incentive for Basmati growers to invest more in the crop which is to increase its production in the country.

63. For IRRI paddy in Sindh, NPC coefficients are fluctuating; however, these have been continuously above one both for Punjab and Sindh except 2011-12 during the period under study. It means that on the whole, IRRI paddy growers are protected through the output price policy which induces producers for promotion of the crop.

10.2 Effective Protection Coefficient (EPC) under Export Situation

64. Effective Protection Coefficient unlike NPC includes both input and output prices in its calculation. Thus it captures the cumulative effect of both costs of inputs and the crop price on the producers of the crop. However, it needs to be mentioned that EPC does not consider all input costs rather considers only traded costs of inputs – 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, the producers of the concerned crop are protected and if it is less than one, they are implicitly taxed. In the former situation farmers are induced to produce more of the crop while in later situation development of the crop discouraged.

65. Review of the EPC values for Basmati paddy produced in **Table-16** indicate that the Basmati growers in Punjab remained implicitly taxed in 2011-12 and 2014-18 because EPCs were less than one during these period. From 2012-14 EPC value significantly increased. In 2012-14 it increased to the level 1.13 and 1.28 against 0.30 to 0.66 in 2011-12 and 2014-18. Its main reason is big jump in domestic price of Basmati paddy in 2012-14 against the 2011-12 and 2014-18 prices.

66. In EPC calculation, difference of the crop revenue and traded inputs' cost at private price is numerator and the difference of the crop revenue and the traded inputs' cost at social price is denominator. As the numerator in 2012-14 relatively increased more than the denominator, EPC coefficient significantly increased. In other words, during 2012-13 basmati growers got a price higher than the corresponding export parity price. EPC value for the same reasons further increased in 2013-14 to the level 1.28 because basmati paddy price was Rs. 1968/40 Kg in 2012-13 which increased to Rs. 2323/ 40 Kg in 2013-14. Both NPC and EPC values dropped for 2014-15 because domestic price drastically dropped in 2014-15 against 2013-14.

67. For IRRI paddy, both in Punjab and Sindh values of EPC coefficients have moved in the same direction and not consistent with the NPCs. EPC coefficients for the reference period are found higher than one except in 2011-12. It means, on the whole input output pricing policy favours IRRI paddy growers in the country which will increase its production in the country.

10.3 Domestic Resource Cost Coefficient (DRC)

Basmati paddy

68. Domestic Resource Cost Coefficient (DRC) is a measure of opportunity cost of domestic resources used per unit of the value added in the production of a crop. DRC value less than one indicates a country's comparative advantage in a commodity and the vice versa. In this calculation numerator is the total non-traded inputs' cost at social prices and denominator is the 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 country and cost of resources employed in its production is less than its import cost.

69. The DRC values for Basmati and IRRI are produced in **Table-16**. For Basmati paddy, DRC coefficient is found always less than one during the analysis period which indicates Pakistan's comparative advantage in Basmati production.

IRRI paddy

70. For IRRI paddy, DRC coefficients for Sindh, most of the time has been less than one which indicates that IRRI production in Sindh province is efficient. The finding supports that Pakistan has comparative advantage in IRRI rice only in the Sindh.

10.4 Cost of Earning Foreign Exchange

71. 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 the 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 presented in **Table-16**.

72. It is observed from column 4 in the referred table that we spend less to earn foreign exchange through Basmati than IRRI export 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.

11. RICE YIELD AMONG COMPETING COUNTRIES

73. Globally rice during **2016** occupied an area of 159.808 million hectares with total production of 740.961 million tonnes. The world top 27 producing countries contribute 95.14 per cent of total area and 96.11 per cent of total production **(Annex-XIV)**.

74. In terms of rice **area,** India is on the top with 42.965 million hectares followed by China with 30.200 million and Indonesia with 14.275 million hectares. Pakistan lies at 11th number in this regard with area of 2.766 million hectares.

75. In terms of rice **production**, China is on the top with 209.503 million tonnes followed by India with 158.757 million and Indonesia with 77.298 million tonnes. Pakistan lies at 10th position with 10.412 million tonnes rice production of the world.

76. In terms of **yield** per hectare, Australia lies at the top with 10289 kgs per hectare followed by Egypt with 9367 and Uruguay with 8569 kgs per hectare. It is a creditable situation that **Pakistan** ranks at 58th in terms of yield while **India** falls at 59th position **(Annex-XV)**. It also implies that there is a lot of potential to raise rice productivity per hectare in Pakistan.

12. MAJOR RICE VARIETIES AND THEIR YIELD POTENTIAL IN PAKISTAN

77. In Pakistan, rice is an important food and cash crop. It is the 2nd most important crop that brings economic prosperity of the growers as well as earns billion of rupees through its export. The yield potential of rice of different varieties being sown in Punjab and Sindh, the major producing provinces of Pakistan, are presented in **Table-17** below:

Table-17: Major Rice Varieties and Their Yield Potential

Variety	Yield Potential Rice Paddy		Shares in the total area of rice paddy
	(Maund/acre)	(Kgs/acre)	(Per cent)
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	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: i) Nuclear Institute for Agriculture & Biology (NIAB), Faisalabd**.**
ii) Rice Research Institute (RRI), Dokri Sindh**.**

78. Pakistan is a major rice exporting country in the World. However, the national realized yield at farmers' farm level is low though yield potential exits in the country. According to the Provincial Agriculture Departments, based on last three years (2015-16 to 2017-18) the average yield of rice paddy of different varieties for the Punjab and Sindh, is 765 kgs per acre for Basmati, 1066 kgs for IRRI and 951 kgs for "others;, in the Punjab. In Sindh, average yield level of IRRI paddy is 1108 kgs per acre and 1687 kgs for other varieties. These yields are much below than the existing potential yield. To meet the ever growing domestic food and export requirements for foreign exchanges, there is a need to take solid efforts to get the existing yield potential realized at the farm level. The yield potential of important rice varieties is presented in **Table-17.**

13. IMPROVED SEED AVAILABILITY OF RICE PADDY

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

80. 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 2012-13 to 2017-18 have been presented in **Annex-XVI.**

81. It may be seen in Annex mentioned above that the supply of certified seed has shown an asymmetrical trend. The availability of certified seed at the country level during referred period augmented and remained approximately at 51.578 thousand tonnes in 2017-18 slightly higher by 0.1 per cent than the available certified seed of 51.535 thousand tonnes during 2016-17.

82. The varietal breakup of the supply of certified seed of rice both in public and private sector for the crop year 2017-18 is presented in **Table-18.**

Table-18: Variety wise Certified Seed of Paddy Supplied by Public and Private Sectors for 2017-18 Crop

Province/ variety	Seed availability (Tonnes)			Area sown	Seed requirement	Seed enough for area
	Public sect.	Pvt. sect.	Total	000 ha.	Tonnes	%
Punjab	**3029.6**	**41438.9**	**44468.5**	**1950.0**	**31545.0**	**141.0**
Basmati (Fine)	720.4	9219.2	9939.6	1370.0	18495.0	**53.7**
IRRI & others	2309.3	32219.7	34529.0	580.0	13050.0	**264.6**
Sindh (IRRI+Others)	**220.2**	**6822.7**	**7042.8**	**845.0**	19013.0	**37.0**
KPK.(Others)	**17.8**	**49.5**	**67.2**	**85.0**	1913.0	**3.5**
Balochistan.(IRRI)	**0.0**	**0.0**	**0.0**	**185.0**	4163.0	**0.0**
All Pakistan						
Basmati	720.4	9219.2	9939.6	1370.0	18495.0	**53.7**
IRRI + other	2547.2	39091.8	41639.0	1695.0	38139.0	**109.2**
Total	**3267.5**	**48311.0**	**51578.6**	**3065.0**	**56634.0**	**91.1**

Source: FSC&RD, Islamabad

83. The provincial variety - wise data presented in the table above shows that in all provinces the major source of supply of certified seed is private sector. The shares of private sector in the respective provincial total seed availability are as: Punjab (93%), Sindh (97%) and KPK (74%) and at country level (94%). It is commendable to point out that keeping in view 20 % annual seed replacement, Punjab and Sindh provinces have surplus certified rice paddy seed with the expectation of KPK and Baluchistan.

14. ACKNOWLEDGEMENTS

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

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ANNEX-I

AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE:
2007-08 TO 2017-18

Year	PUNJAB				SINDH			KH. PUKH Total	Baloch. Total	Pakistan			
	Basmati	IRRI	Others	Total	IRRI	Others	Total	(Others)	(IRRI)	Basmati	IRRI	Others	Total
AREA	---------- Thousand hectares ----------												
2007-08	1377.1	159.8	186.6	1723.5	531.1	62.9	594.0	61.7	136.2	1377.1	827.1	311.2	2515.4
2008-09	1548.3	202.3	227.0	1977.6	560.3	173.2	733.5	61.3	190.1	1548.3	952.7	461.5	2962.5
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
YIELD	---------- kgs per hectare ----------												
2007-08	1781	2593	2243	1907	3232	1609	3060	2079	2433	1781	2977	2083	2212
2008-09	1680	2559	2307	1842	3479	3393	3459	2091	3386	1680	3265	2686	2347
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
PRODUCTION	---------- Thousand tonnes ----------												
2007-08	2453.1	414.4	418.5	3286.0	1716.5	101.2	1817.7	128.3	331.4	2453.1	2462.3	648.0	5563.4
2008-09	2601.6	517.7	523.7	3643.0	1949.3	587.7	2537.0	128.2	643.7	2601.6	3110.7	1239.6	6951.9
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

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 2007-08 to 2015-16, Agricultural Statistics of Pakistan 2015-16, MINFA Islamabad.
2. For 2016-17 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2017-18 : Final estimates provided by concerned Provincial Agriculture Departments.

ANNEX-I-A

AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE:
2007-08 TO 2017-18

Year	PUNJAB				SINDH			KH. PUKH Total	Baloch. Total	Pakistan			
	Basmati	IRRI	Others	Total	IRRI	Others	Total	(Others)	(IRRI)	Basmati	IRRI	Others	Total
AREA	---------- Thousand acres ----------												
2007-08	3403.0	394.9	461.0	4258.8	1312.4	155.4	1467.8	152.5	336.6	3403.0	2043.8	768.9	6215.7
2008-09	3826.0	499.9	560.9	4886.8	1384.6	428.0	1812.6	151.5	469.8	3826.0	2354.2	1140.4	7320.6
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	2046.8	152.2	419.6	3500.1	1621.5	2046.1	7167.7
YIELD	---------- kgs per acre ----------												
2007-08	721	1049	908	772	1308	651	1238	841	985	721	1205	843	895
2008-09	680	1036	934	745	1408	1373	1400	846	1370	680	1321	1087	950
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
PRODUCTIO	---------- Thousand tonnes ----------												
2007-08	2453.1	414.4	418.5	3286.0	1716.5	101.2	1817.7	128.3	331.4	2453.1	2462.3	648.0	5563.4
2008-09	2601.6	517.7	523.7	3643.0	1949.3	587.7	2537.0	128.2	643.7	2601.6	3110.7	1239.6	6951.9
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

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 2007-08 to 2015-16, Agricultural Statistics of Pakistan 2015-16, MINFA Islamabad.
2. For 2016-17 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2017-18 : Final estimates provided by concerned Provincial Agriculture Departments.

Annex-II

DISTRICT-WASE PRODUCTION OF RICE BY VARIETY: AVERAGE OF 2015-16 TO 2017-18

"000"tonnes

S.No	Province/ District	Basmati	IRRI	Others	Total	Percent	S.No	Province/ District	Basmati	IRRI	Others	Total	Percent
	Punjab							**KPK**					
1	Gujranwala	165.3	0.0	335.8	501.1	7.1	1	D.I.Khan	-	-	33.7	33.7	0.5
2	Okara	130.7	196.7	22.6	350.0	5.0	2	Dir Lower	-	-	21.3	21.3	0.3
3	Sheikhupura	282.6	0.0	46.5	329.2	4.7	3	Kurram AG.	-	-	20.8	20.8	0.3
4	Hafizabad	219.1	0.0	81.4	300.5	4.3	4	Dir Upper	-	-	14.6	14.6	0.2
5	Sialkot	218.8	0.0	29.2	248.0	3.5	5	Swat	-	-	14.4	14.4	0.2
6	Nankana Sahib	191.2	0.0	27.7	218.9	3.1	6	Malakand	-	-	10.8	10.8	0.2
7	Bahawalnagar	124.0	10.2	16.1	150.3	2.1	7	Bajour AG.	-	-	6.9	6.9	0.1
8	Kasur	60.1	20.2	49.0	129.2	1.8	8	Bannu	-	-	6.2	6.2	0.1
9	Pakpattan	95.5	22.1	5.6	123.2	1.8	9	Mansehra	-	-	5.2	5.2	0.1
10	M.B.Din	110.2	0.0	9.9	120.1	1.7	10	Chitral	-	-	3.9	3.9	0.1
11	Narowal	115.7	0.0	2.8	118.5	1.7	11	Battagram	-	-	3.7	3.7	0.1
12	Jhang	100.7	0.0	2.1	102.8	1.5	12	Shangla	-	-	3.4	3.4	0.0
13	D.G.Khan	1.7	97.2	0.0	98.9	1.4	13	Mardan	-	-	3.2	3.2	0.0
14	T.T.Singh	85.1	0.0	0.7	85.8	1.2	14	Swabi	-	-	1.5	1.5	0.0
15	Chiniot	56.8	9.4	5.3	71.5	1.0	15	Peshawar	-	-	0.7	0.7	0.0
16	Muzaffargarh	40.3	24.3	1.5	66.1	0.9	16	Hangu	-	-	0.6	0.6	0.0
17	Vehari	62.1	0.4	0.0	62.4	0.9	17	Bunir	-	-	0.6	0.6	0.0
18	Lahore	44.0	0.8	17.2	62.1	0.9	18	Orakzai AG	-	-	0.3	0.3	0.0
19	Sahiwal	55.9	0.8	1.4	58.1	0.8	19	Charsadda	-	-	0.3	0.3	0.0
20	Sargodha	49.8	0.0	6.0	55.8	0.8	20	Lakki Marwat	-	-	0.3	0.3	0.0
21	Gujrat	50.4	0.0	4.7	55.1	0.8	21	Tank	-	-	0.2	0.2	0.0
22	Khanewal	52.8	0.0	0.4	53.2	0.8	22	Nowshera	-	-	0.2	0.2	0.0
23	Faisalabad	42.3	0.0	7.6	49.9	0.7	23	Kohistan	-	-	0.2	0.2	0.0
24	Khushab	48.6	0.0	0.0	48.6	0.7	24	Kohat	-	-	0.1	0.1	0.0
25	Multan	26.9	9.6	6.1	42.7	0.6	25	F.R.D.I.Khan	-	-	0.1	0.1	0.0
26	R.Y.Khan	34.5	6.0	0.0	40.6	0.6	26	N.Waziristan	-	-	0.0	0.0	0.0
27	Bahawalpur	24.2	2.2	0.0	26.4	0.4	27	Karak	-	-	0.0	0.0	0.0
28	Layyah	20.3	0.0	0.0	20.3	0.3	28	Abbottabad	-	-	0.0	0.0	0.0
29	Lodhran	17.9	0.0	0.0	17.9	0.3	29	Haripur	-	-	0.0	0.0	0.0
30	Mianwali	9.5	0.0	0.0	9.5	0.1	30	Mohmand AG.	-	-	0.0	0.0	0.0
31	Rajanpur	0.0	5.1	0.0	5.1	0.1	31	Khyber AG.	-	-	0.0	0.0	0.0
32	Jhelum	2.1	0.0	0.0	2.1	0.0	32	S.Waziristan	-	-	0.0	0.0	0.0
33	Bhakkar	0.9	0.0	0.0	0.9	0.0	33	F.R.Peshawar	-	-	0.0	0.0	0.0
34	Attock	0.0	0.0	0.0	0.0	0.0	34	F.R.Kohat	-	-	0.0	0.0	0.0
35	Rawalpindi	0.0	0.0	0.0	0.0	0.0	35	F.R.Bannu	-	-	0.0	0.0	0.0
36	Islamabad	0.0	0.0	0.0	0.0	0.0							
37	Chakwal	0.0	0.0	0.0	0.0	0.0							
	Sub Total	**2540.1**	**405.0**	**679.9**	**3625.0**	**51.5**		**Sub Total**	**0.0**	**0.0**	**153.2**	**153.2**	**2.2**
	Sindh							**Balochistan**					
1	Badin	-	124.5	405.1	529.6	7.5	1	Jaffarabad	-	331.7	-	331.7	4.7
2	Larkana	-	200.8	208.7	409.6	5.8	2	Nasirabad		222.2	-	222.2	3.2
3	Shikarpur	-	104.1	250.0	354.1	5.0	3	Khuzdar	-	2.7	-	2.7	0.0
4	Jacobabad	-	33.8	289.6	323.4	4.6	4	Turbat	-	2.5	-	2.5	0.0
5	Qambar	-	173.9	148.4	322.3	4.6	5	Awaran	-	0.6	-	0.6	0.0
6	Kashmore	-	61.7	214.1	275.8	3.9	6	Jhal Magsi	-	0.4	-	0.4	0.0
7	Thatta	-	153.2	81.0	234.2	3.3	7	Dera Budghti	-	0.2	-	0.2	0.0
8	Dadu	-	82.9	104.3	187.2	2.7	8	Sibi	-	0.1	-	0.1	0.0
9	T.M.Khan	-	15.2	39.7	54.9	0.8	9	Lasbella	-	0.1	-	0.1	0.0
10	Hyderabad	-	0.7	3.2	3.9	0.1	10	Punjgoor	-	0.0	-	0.0	0.0
11	Khairpur	-	0.0	0.0	0.0	0.0	11	Quetta	-	0.0	-	0.0	0.0
12	Ghotki	-	0.0	0.0	0.0	0.0	12	Pishin	-	0.0	-	0.0	0.0
13	Sukkur	-	0.0	0.0	0.0	0.0	13	K.Abdullah	-	0.0	-	0.0	0.0
14	N.Feroze	-	0.0	0.0	0.0	0.0	14	Chaghi	-	0.0	-	0.0	0.0
15	Nawabshah	-	0.0	0.0	0.0	0.0	15	Loralai	-	0.0	-	0.0	0.0
16	Sanghar	-	0.0	0.0	0.0	0.0	16	Musa Khail	-	0.0	-	0.0	0.0
17	Tharparkar	-	0.0	0.0	0.0	0.0	17	Barkhan		0.0	-	0.0	0.0
18	Mirpurkhas	-	0.0	0.0	0.0	0.0	18	Zhob	-	0.0	-	0.0	0.0
19	Umerkot	-	0.0	0.0	0.0	0.0	19	K.Saifullah	-	0.0	-	0.0	0.0
20	Jamshoro	-	0.0	0.0	0.0	0.0	20	Ziarat	-	0.0	-	0.0	0.0
21	Matiari	-	0.0	0.0	0.0	0.0	21	Kohlu	-	0.0	-	0.0	0.0
22	Tando Allahyar	-	0.0	0.0	0.0	0.0	22	Bolan		0.0	-	0.0	0.0
23	Karachi	-	0.0	0.0	0.0	0.0	23	Kalat		0.0	-	0.0	0.0
							24	Mastung	-	0.0	-	0.0	0.0
							25	Kharan	-	0.0	-	0.0	0.0
							26	Gawadar	-	0.0	-	0.0	0.0
	Sindh Total	-	**950.9**	**1744.0**	**2695.0**	**38.3**		**Balochistan Total**	**-**	**560.3**	**-**	**560.3**	**8.0**
								Pakistan Total	**2540.1**	**1916.3**	**2577.1**	**7033.5**	**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

ANNEX-III

PER CAPITA AVAILABILITY (CONSUMPTION) OF RICE: 2014-15 to 2016-17

S.No	Items	2014-15	2015-16	2016-17
		----------Thousands tonnes----------		
	Production	7003	6801	6849
2	Deduction for seed, feed and wastage @ 6 percent for production	420	408	411
3	Export	3786	4262	3519
4	Net availability	2797	2131	2919
		----------Millions----------		
5	Population	199.29	202.95	206.78
		----------Kgs----------		
6	Per capita availability (consumption)	14.03	10.50	14.12
7	Average per capita availability Average (2014-15 to 2016-17)		**12.88**	

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

Source:

1 For Imports and Exports: Federal Bureau of Statistics, Karachi.
2 For Population of Pakistan: Economic Survey, 2016-17.
3 For Population of AJ&K and NAs: Population Census Organization, Islamabad.
4 For Population of Afghan refugees: Kasmir Affairs and Northern Areas and States and Frontier Regions Division, Government of Pakistan, Islamabad.

ANNEX-IV

Average farmer cost of production of super basmati in Punjab: 2017-18 and 2018-19 crops

S. No	operation/input	Unit	Avg. no of operations/ acre	Rate/ unit	Cost/ acre	Avg. no of operations/ acre	Rate/ unit	Cost/ acre	Change in 2017-18 over 2016-17
				….2017-18…..			….2018-19…..		
1	Land preparation			….Rs….			…....Rs…..		
	1.1 Dry ploughing	No	4.0	500.0	2000	4.0	600.0	2400	400
	1.2 Wet ploughing	No	2.0	981.0	1962	2.0	1170.0	2340	378
	1.3 Wet planking	"	2.0		0	2.0		0	0
2	Seed								
	2.1 Nursery including treatment & FYM costs	Marla/ acre	3.4	310.0	1574	3.4	400.0	2034.0	460
	2.2 Nursery uprooting, transport and planting	Rs./acre			4003			5000.0	997
3	Labour for bund making	M. day	0.984	450	442.8	0.984	450	442.8	0
4	Weeding								
	4.1 Manual	M. day	1.15	400	460	1.15	450	517.5	58
	4.2 Weedicides	No. of spray/ a	0.37	600	220.2	0.37	700	256.9	37
5	Plant protection including application	No. of applicat	0.786	400	314.4	0.786	400	314.4	0
6	Irrigation								94
	6.1 Canal	Rs/ acre	10.776	-	95.72	10.776	-	95.72	0
	6.2 Private tube well	No. of irrigatio	8.3	750.0	6241	8.3	850.0	7072.9	832
	6.3 labor used for irrigation & water course cleaning	M. day	6.1	450.0	2752	6.1	450.0	2752.2	0
7	Farm Yard Manure @ 25% of actual cost plus cost of transport & application	No. of trolley	0.2	3485.7	174.3	0.2	4008.6	200.4	26
8	Fertilizer	No. of bag							
	8.1 DAP	"	0.585	2450	1433	0.585	3275	1915.9	483
	8.2 Urea	"	1.146	1400	1604	1.146	1625	1862.3	258
	8.3 NP	"	0.195	1911	373	0.195	2525	492.4	120
	8.4 Zinc sulphate	"	0.316	687	217	0.316	700	221.2	4
	8.5 Potash	"	0.2	3470	694	0.2	3588	717.6	24
	8.6 Fertilizer transport & application	No. of bag	2.27	120.2	273	2.27	125	283.8	11
8	Farm investment (item 1 to 7 minus 6.1)	Rs			24738			28824.1	4086
9	Mark up on investment @ 12.4 % for 6 months on item 1 to item 8 minus item 6.1	"			1732			1729.4	-2
10	Harvesting, threshing etc	Kg/acre			2800			3000.0	
11	Management charges for 6 months	Rs	-		1563	-		1719.3	156
12	Land rent for 6 months	"		23000	11500		27000	13500.0	2000
13	Land revenue, local rate, panchotra etc				5			5.0	0
14	Average land tax @ Rs 132/ acre for 6 months	"		132	66		100	50.0	-16
15	Gross cost (item 1-14)	"			42499			48923.6	6424
16	Value of paddy straw	Rs./acre			7000			7000.0	0
17	Net cost of cultivation (item 15-16)								
	17.1 including land rent	Rs./ acre			35499			41923.6	6424
	17.2 excluding land rent	"			23999			28423.6	4424
18	Yield	Kg			**1200**			**1200**	0
19	Cost of production at farm gate (Rs./40 Kg)								
	19.1 With land rent				1183.3			1397.5	214
	19.2 Without land rent				800.0			947.5	147
20	Marketing chrages	Rs./ 40 Kg			50.0			50.0	0
21	Cost of production at market level (Rs./40 Kg)	Rs./ 40 Kg							
	21.1 With land rent				1233.3			1447.5	214
	21.2 Without land rent				850.0			997.5	147

Source:

* API field survey, August 2017

** Mark up on investment used @ 12.4% as reported by the ZTBL, Islamabad during Oct. 2018.

Notes:

1. Cost of one tube well irrigation is derived by multiplying Rs 300/hour by 2.5 hours time per irrigation.

2. Cost of FYM - Per acre cost of FYM shown in the table is 25% of the actual cost paid for farm yard manure. The underlying assumption is that effect of FYM lasts for two years i.e 50% of it will be consumed by rice crop and rest will be consumed by the following crops. Again 50% consumption by paddy is reduced by 50% because paddy is a six month crop.

ANNEX-V

Average farmer cost of production of IRRI paddy in Punjab: 2017-18 and 2018-19 crops

S. No	operation/input	Unit	Avg. no. of operations/ unit/acre	Rs./ unit	Cost/ acre	Avg. no of operations/ acre	Rate/ unit	Cost/ acre	Change in 2017-18 over 2016-17
				….2017-18…..			….2018-19…..		
1	Land preparation				.....Rs.....			.....Rs.....	Rs
	1.1 Dry ploughing	No	4	500.0	2000.0	4	600.0	2400.0	400
	1.2 Wet ploughing	"	2	981.0	1962.0	2	1170.0	2340.0	378
	1.3 Wet planking	"	1		0.0	1		0.0	0
2	Nursery	Marla/ acre	3.494	310.0	1083.1	3.494	400.0	1397.6	314
3	Uprooting, trnassporting and transplanting (contract)	Rs/ acre			3500.0			3500.0	0
4	Labour for bund making	M. day	1.15	450.0	517.5	1.15	450.0	517.5	0
5	Weeding								
	5.1 Manual	M. day	1.338	400.0	535.2	1.338	450.0	602.1	67
	5.2 Weedicides	No. of spray	0.655	600.0	393.0	0.655	700.0	458.5	66
6	Plant protection								
	6.1 Formulated spray	No. of spray	0.812	381.0	309.4	0.812	400.0	324.8	15
7	FYM @25% of actual cost plus cost of transport & application	Trolley	0.196	3486.0	170.8	0.196	4008.9	196.4	26
8	Fertilizer application								
	8.1 DAP	Bag	0.702	2450.0	1719.9	0.702	3275.0	2299.1	579
	8.2 Urea	"	1.498	1400.0	2097.2	1.498	1625.0	2434.3	337
	8.3 NP	"	0.303			0.303			0
	8.3 Zinc Sulphate	"	0.818	687.0	562.0	0.818	700.0	572.6	11
	8.4 Fertilizer transport and application	"	3.337	90.0	300.3	3.337	95.0	317.0	17
9	Irrigation								
	9.1 Canal	Rs./ acre			95.7			95.7	0
	9.2 Private tube well	No. of irrigation	4.493	750.0	3369.8	4.493	862.5	3875.2	505
	9.3 labor used for irrigation and water courses cleaning	M. day	5.964	450.0	2683.8	5.964	450.0	2683.8	0
10	Farm investment (item 1-item 9)	Rs./acre			21204.0			23918.9	2715
11	Mark up on invetsment @ 12.4% per annum for 6 months on item 10 minus item 9.1	Rs			1484.3			1674.3	190
12	Harvesting and threshing etc	Kgs. acre	134.1		2800.0	134.1		3000.0	200
13	Management charges for 6 months	"			1563.0			1719.3	156
14	Land rent for 6 months	Rs/ annum		23000.0	11500.0		27000.0	13500.0	2000
15	Land revenue, local rate, panchotra etc	Rs/ acre		5.0	5.0		5.0	5.0	0
16	Land tax @ Rs 200/acre/annum for 6 months	"		132.0	66.0		100.0	50.0	-16
17	Gross cost (Item 1-15)	"			38718.0			43963.2	5245
18	Value of paddy straw	"			7000.0			7000.0	0
19	Net cost of cultivation (Item 16-17)	"							0
	19.1 With land rent	"			31718.0			36963.2	5245
	19.2 Without land rent	"			20218.0			23463.2	3245
20	Yield per acre	Kg			**1700.0**			**1700.0**	0
21	Cost of production at farm level								
	21.1 With land rent	Rs./ 40 kg			746.3			869.7	123
	21.2 Without land rent	"			475.7			552.1	76
22	Marketing charges ie loading, transport, agent's commission and weighment	"			50.0			50.0	0
23	Cost of production at market level								
	23.1 With land rent	"			796.3			919.7	123
	23.2 Without land rent	"			525.7			602.1	76

ANNEX-VI

Average farmer cost of production of IRRI paddy in Sindh: 2016-17 and 2017-18 crops

S. No	Operation/input	Unit	Avg. no. of operations/ unit/acre	Rs./ unit	Cost/ acre	Avg. no of operations/ acre	Rate/ unit	Cost/ acre	Change in 2017-18 over 2016-17
				….2017-18…..			….2018-19…..		
1	Land preparation			....Rs…..			.....Rs…..		Rs
	1.1 Dry ploughing	No	5.0	666.0	3330.0	5.0	750.0	3750.0	420.0
	1.2 Dry planking	"	1.0	333.0	333.0	1.0	375.0	375.0	42.0
	1.3 Wet Ploughing	"							0.0
	1.4 Levelling	Tractor hour	1.0	700.0	700.0	1.0	750.0	750.0	50.0
2	Nursery	Ghunta	1.0	2000.0	2000.0	1.0	3500.0	3500.0	1500.0
3	Uprooting, trnassporting and transplanting (contract)	Rs./ acre			2500.0			3200.0	700.0
4	Labour for bund making	M. day	2.0	400.0	800.0	2.0	400.0	800.0	0.0
5	Manual weeding	M. day	2.4	400.0	974.0	2.4	400.0	974.0	0.0
6	Plant protection								0.0
	6.1 Granular pesticides	No. of spray	0.7	400.0	293.2	0.7	460.0	337.2	44.0
	6.2 Formulated spray	No. of spray	0.1	1126.0	85.6	0.1	1294.9	98.4	12.8
7	FYM @ 25% of the actual cost (includes transport & application	Trolley	0.0	2900.0	20.3	0.0	3335.0	23.3	3.0
8	Fertilizer application								
	8.1 DAP	Bag	0.9	2450.0	2320.2	0.9	3275.0	3101.4	781.3
	8.2 Urea	"	1.4	1400.0	1937.6	1.4	1625.0	2249.0	311.4
	8.3 Zinc Sulphate	"	0.1	687.0	35.0	0.1	700.0	35.7	0.7
	8.4 Fertilizer transport and application	"	2.4	77.0	183.6	2.4	88.6	211.2	27.7
9	Irrigation								0.0
	9.1 Canal	Cost/ acre	17.9		95.7	17.9		95.7	
	9.2 Private tube well	Irrigations	0.5	750.0	391.5	0.5	862.5	450.2	58.7
	9.3 labor used for irrigation and water courses cleaning	M. day	5.6	400.0	2238.0	5.6	400.0	2238.0	0.0
10	Farm investment (item 1 minus item 9.1)				**18141.9**			**22093.5**	3951.6
11	Mark up on invetsment @ 12.4% per annum for 6 months				1269.9			1363.9	94.0
	on item1 to 9 minus item 9.1								0.0
12	Harvesting and threshing etc	Kg/acre	185.3			185.3			
		For 2016-17 lumpsum Rs 3200/acre			3200.0			3500.0	
13	Management charges for 6 months	"		1563.0	1563.0		1719.3	1719.3	156.3
14	Land rent for 6 months (Rs./ annum/acre)	Rs/ annum		20000.0	10000.0		25000.0	12500.0	2500.0
15	Land revenue, local rate, panchotra etc	"		5.0	5.0		5.0	5.0	0.0
16	Land tax @ Rs 200/acre/annum for 6 months	"		100.0	50.0		100.0	50.0	0.0
17	Drainage Cess @ Rs 24/annuam/acre for 6 months	"		24.0	12.0		24.0	12.0	0.0
18	Gross cost (Item 1 to 15 minus item 8.1)				34241.9			41243.7	7001.8
19	Value of paddy straw	Rs/ acre	-		6000.0	-		5000.0	-1000.0
20	Net cost of cultivation (Item 16-17)								0.0
	20.1 With land rent	Cost/acre			28241.9			36243.7	8001.8
	20.2 Without land rent	"			18241.9			23743.7	5501.8
21	Yield per acre	Kg			**2200.0**			**2000.0**	-200.0
22	Cost of production at farm level								
	22.1 With land rent	Rs./ 40 Kg			513.5			724.9	211.4
	22.2 Without land rent	"			331.7			474.9	143.2
23	Marketing charges ie loading, transport, agent's	"			50.0			50.0	0.0
	commission and weighment								
24	Cost of production at market level								
	24.1 With land rent	Rs./ 40 Kg			563.5			774.9	211.4
	24.2 Without land rent	"			381.7			524.9	143.2

ANNEX-VII

ECONOMICS OF RICE PADDY AND COMPETING CROPS AT PRICES REALIZED BY THE GROWERS: 2017-18 CROPS

S.No	Province/crops/ crop combination	Crop duration	Water used	Gross cost	Cost of purchased inputs	Gross revenue	Gross margin	Net income	Output-input ratio	Revenue per		
										Rupee of purchased inputs	Crop day	Acre inch of water used
		Days	Acre inches	.....Rupees per acre.....					Ratio	.....Rupees.....		
	1	2	3	4	5	6	7=6-5	8=6-4	9=6/4	10=6/5	11=6/2	12=6/3
	Punjab											
1	Basmati Paddy	180	58	44,106	19,846	48,041	28,195	3,935	1.09	2.42	267	828
2	IRRI Paddy	180	62	39,583	16,476	35,833	19,357	(3,751)	0.91	2.17	199	578
3	Seed Cotton	240	22	51,820	16,923	59,767	42,844	7,947	1.15	3.53	249	2,717
4	Wheat	180	12	40,225	10,905	44,063	33,158	3,837	1.10	4.04	245	3,672
5	Sunflower (spring)	180	22	45,156	17,710	47,240	29,531	2,084	1.05	2.67	262	2,147
6	Seed Cotton + Wheat	420	34	92,045	27,828	103,830	76,002	11,784	1.13	3.73	247	3,054
7	Seed Cotton+Sunflower	420	44	96,976	34,632	107,007	72,375	10,031	1.10	3.09	255	2,432
8	Basmati Paddy+Wheat	360	70	84,331	30,751	92,103	61,352	7,772	1.09	3.00	256	1,316
9	Basmati Paddy+Sunflower	360	80	89,262	37,555	95,281	57,725	6,019	1.07	2.54	265	1,191
10	IRRI Paddy + Wheat	360	74	79,808	27,380	79,895	52,515	87	1.00	2.92	222	1,080
11	IRRI Paddy+Sunflower	360	84	84,739	34,185	83,073	48,887	(1,667)	0.98	2.43	231	989
12	Sugarcane	394	48	79,323	18,288	93,725	75,437	14,402	1.18	5.12	238	1,953
	Sindh											
1	IRRI Paddy	180	56	36,429	12,089	47,235	35,147	10,807	1.30	3.91	262	843
2	Seed Cotton	240	18	54,711	16,451	73,875	57,424	19,164	1.35	4.49	308	4,104
3	Wheat	180	12	37,298	10,998	41,363	30,364	4,064	1.11	3.76	230	3,447
4	Sunflower (spring)	180	22	43,759	17,050	29,475	12,425	(14,284)	0.67	1.73	164	1,340
5	Seed Cotton + Wheat	420	30	92,009	27,449	115,238	87,788	23,229	1.25	4.20	274	3,841
6	Seed Cotton+Sunflower	420	40	98,470	27,449	103,350	75,901	4,880	1.05	3.77	246	2,584
7	IRRI Paddy+ Wheat	360	68	73,727	23,087	88,598	65,511	14,871	1.20	3.84	246	1,303
8	IRRI Paddy+Sunflower	360	78	80,188	29,139	76,710	47,571	(3,478)	0.96	2.63	213	983
9	Sugarcane	488	71	102,527	25,990	119,891	93,901	17,365	1.17	4.61	246	1,689

ANNEX-VIII

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

S.No	Item	Sept, 18	2017-18	2014-17
		--------- US $ Per Tonne --------		
1.	Average fob (Karachi) prices of rice	Latest Month		
	US$ per tonne	995.00	1105.84	951.81
	Current exchange rate (Rs per US$)	132.00	132.00	132.00
	Pak Rupees per tonne	131340	145971	125639
		------- Rs per 40 kgs ------		
		5254	5839	5026
2.	Expenses from sheller/ market to export point	225	225	225
3.	Producer area market level price of rice (item 1-item 2)	5029	5614	4801
4.	Product recoveries per 100 kgs of paddy	.....Kgs.....		
	i) Head rice of export quality @ 70 of normal recovery	35.0	35.0	35.0
	ii) Short grain rice @25% of normal recovery	12.5	12.5	12.5
	iii) Brokens	20.0	20.0	20.0
	iv) Tips	3.5	3.5	3.5
	v) Bran powder	6.0	6.0	6.0
	vi) Husk and dust	23.0	23.0	23.0
5.	Prices of products	----------Rs per 40 kgs----------		
	i) Export quality rice as calculated in item 3	5029	5614	4801
	ii) Short grain rice (70% of export quality -item 3)	3520	3930	3360
	iii) Brokens (50% of short grainrice)	2514	2807	2400
	iv) Tips (30% of short grainrice)	1509	1684	1440
	v) Bran powder (15% of short grainrice)	754	842	720
	vi) Husk	90	90	90
6.	Value of products recoverable from 100 kgs paddy			
	i) Export quality rice	4400	4912	4200
	ii) Short grain rice	1100	1228	1050
	iii) Brokens	1257	1403	1200
	iv) Tips	132	147	126
	v) Bran powder	113	126	108
	vi) Husk	52	52	52
	vii) **Total value of all products**	**7054**	**7869**	**6737**
7.	Husking/Processing /financial charges of			
	i) 100 kgs paddy	225	225	225
	ii) Export quality rice @Rs1 per Kg	63	63	63
8.	Mill-gate price of paddy per 100 kgs	6766	7581	6449
9.	Mill-gate price of paddy per 40 kgs	2706	3032	2579

Sources:

1 Federal Bureau of Statistics, Karachi.

2 Rice Exporters/Millers for incidental charges.

ANNEX-IX

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

S.No	Item	Sept, 18	2017-18	2014-17
		--------- US $ Per Tonne --------		
1.	Average fob (Karachi) prices of rice			
	US$ per tonne	348.25	361.5	347.42
	Current exchange rate (Rs per US$)	132.00	132.00	132.00
	Pak Rupees per tonne	45969	47719	45859
		------- Rs per 40 kgs ------		
		1839	1909	1834
2.	Expenses from sheller/ market to export point	125	125	125
3.	Producer area market level price of rice (item 1-item 2)	1714	1784	1709
4.	Product recoveries per 100 kgs of paddy	.....Kgs.....		
i)	Head rice of export quality @ 70 of normal recovery	33.6	33.6	33.6
ii)	Short grain rice @25% of normal recovery	12.4	12.4	12.4
iii)	Brokens	14.0	14.0	14.0
iv)	Tips	7.0	7.0	7.0
v)	Bran powder	7.0	7.0	7.0
vi)	Husk and dust	26.0	26.0	26.0
5.	Prices of products	----------Rs per 40 kgs---------		
i)	Export quality rice as calculated in item 3	1714	1784	1709
ii)	Short grain rice (70% of export quality -item 3)	1200	1249	1197
iii)	Brokens (50% of short grainrice)	600	624	598
iv)	Tips (30% of short grainrice)	360	375	359
v)	Bran powder (15% of short grainrice)	180	187	179
vi)	Husk	90	90	90
6.	Value of products recoverable from 100 kgs paddy			
i)	Export quality rice	1440	1498	1436
ii)	Short grain rice	372	387	371
iii)	Brokens	210	219	209
iv)	Tips	63	66	63
v)	Bran powder	31	33	31
vi)	Husk	59	59	59
vi)	**Total value of all products**	**2174**	**2261**	**2169**
7	Husking/Processing /financial charges of			
i)	100 kgs paddy	225	225	225
ii)	Export quality rice @Rs1 per Kg	63	63	63
8.	Mill-gate price of paddy per 100 kgs	1886	1973	1881
9.	Mill-gate price of paddy per 40 kgs	755	789	752

Source:

1 Federal Bureau of Statistics, Karachi.

2 Rice Exporters/Millers for incidental charges.

Annex- X

REGION WISE EXPORT OF BASMATI AND COARSE RICE DURING : 2016-17 AND 2017-18

Region	Quantity			Value			% Share in in total export	
	2016-17	2017-18	%	2016-17	2017-18	%	2016-17	2017-18
	....000 tonnes.....		Change	...Million US $...		Change	Per cent	
A. Basmati Rice								
Asia	322.5	246.004	**-23.72**	310.30	255.41	**-17.69**	68.73	43.85
Oceania	15.6	14.438	**-7.45**	14.40	16.06	**11.53**	3.32	2.57
Europe	75.8	244.009	**221.91**	75.50	248.59	**229.26**	16.16	43.49
Africa	27.7	29.777	**7.50**	24.70	28.92	**17.07**	5.90	5.31
America	27.6	26.806	**-2.88**	28.60	32.95	**15.19**	5.88	4.78
Total	**469.2**	**561.034**	**19.57**	**453.5**	**581.93**	**28.32**	**100.00**	**100.00**
CIS	39.5	30.094	**-23.81**	33.10	30.47	**-7.94**	8.42	5.36
B. Coarse Rice								
Asia	1278.0	1505.3	**17.78**	479.80	657.33	**37.00**	44.44	42.46
Oceania	3.0	3.1	**3.40**	2.20	2.02	**-8.32**	0.10	0.09
Europe	226.0	135.7	**-39.95**	103.40	74.74	**-27.72**	7.86	3.83
Africa	1360.0	1891.9	**39.11**	511.90	718.10	**40.28**	47.29	53.36
America	9.0	9.2	**2.41**	4.70	4.34	**-7.68**	0.31	0.26
Total	**2876**	**3545.153**	**23.27**	**1102.00**	**1456.53**	**32.17**	**100.00**	**100.00**
CIS	1595.0	201.9	**-87.34**	619.90	77.80	**-87.45**	55.46	5.70

Source: FBS, Karachi

Annex-XI

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

Based on export parity prices

Description	Revenues	Traded inputs cost	Domestic factor cost	Domestic Profits
		--------- Rupees per acre ---------		
2011-12				
Private Prices	39987	16142	18602	5243
Social Prices	49616	13559	18791	17266
Transfers	-9630	2583	-189	-12023
2012-13				
Private Prices	56808	18277	21002	17529
Social Prices	49370	15353	21191	12826
Transfers	7438	2924	-189	4703
2013-14				
Private Prices	67153	18954	23660	24539
Social Prices	53518	15922	23849	13747
Transfers	13635	3033	-189	10791
2014-15				
Private Prices	41907	19902	26714	-4709
Social Prices	55925	16588	26936	12402
Transfers	-14018	3314	-221	-17111
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	11040	2043	42607
Social Prices	68290	11491	2982	53817
Transfers	-12600	-452	-939	-11209

Annex-XII

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

POLICY ANALYSIS MATRIX (PAM)

Based on export parity prices

Description	Revenues	Traded Input Cost	Domestic Factor Cost	Profits
		--------- Rupees per acre ---------		
2011-12				
Private Prices	36484	14104	18292	4087
Social Prices	47390	11966	18481	16943
Transfers	-10906	2139	-189	-12856
2012-13				
Private Prices	36820	16038	20350	432
Social Prices	31576	13593	20539	-2556
Transfers	5244	2445	-189	2988
2013-14				
Private Prices	37244	16512	21480	-748
Social Prices	30746	13986	21669	-4909
Transfers	6498	2526	-189	4161
2014-15				
Private Prices	36474	16970	24149	-4644
Social Prices	31038	14228	24370	-7560
Transfers	5436	2741	-221	2916
2015-16				
Private Prices	31001	17198	24153	-10350
Social Prices	25414	14469	24374	-13430
Transfers	5587	2729	-221	3080
2016-17				
Private Prices	32210	13352	26005	-7147
Social Prices	26005	11123	26226	-11344
Transfers	6205	2229	-221	4197
2017-18				
Private Prices	40873	12495	26223	2155
Social Prices	38408	10349	26444	1615
Transfers	2465	2146	-221	540

Annex-XIII

ECONOMIC EFFICIENCY OF RESOURCE USE IN IRRI (PADDY) PRODUCTION IN SINDH
POLICY ANALYSIS MATRIX (PAM)

Based on export parity prices

Description	Revenues	Traded inputs cost	Domestic Factor cost	Profits
		--------- Rupees per acre ---------		
2011-12				
Private Prices	41480	11854	18234	11392
Social Prices	61871	9902	18388	33580
Transfers	-20391	1952	-154	-22188
2012-13				
Private Prices	46089	13391	19622	13076
Social Prices	39175	11187	19776	8212
Transfers	6914	2204	-154	4864
2013-14				
Private Prices	45989	13937	21605	10446
Social Prices	37672	11647	21759	4266
Transfers	8317	2291	-154	6180
2014-15				
Private Prices	43935	14605	23404	5926
Social Prices	36720	12122	23558	1040
Transfers	7214	2483	-154	4886
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