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RICE PADDY POLICY ANALYSIS

FOR

2013-14 CROP

AGRICULTURE POLICY INSTITUTE
MINISTRY OF NATIONAL FOOD SECURITY AND RESEARCH
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ACRONYMS AND ABBREVIATIONS

API	Agriculture Policy Institute
BMR	Balancing Modernization Replacement
COP	Cost of Production
CPI	Consumer Price Index
DR	Dokri Research
DRC	Domestic Resource Cost
E&M	Economics and Marketing
ECC	Economic Coordination Committee(of the cabinet)
EPC	Effective Protection Coefficient
FAO	Food and Agriculture Organization
FAQ	Fair Average Quality
FCA	Federal Committee on Agriculture
FOB	Free on Board
FMI	Farm Machinery Institute
FSC&RD	Federal Seed Certification and Registration Department
FYM	Farm Yard Manure
GAP	Good Agriculture Practices
GST	General Sales Tax
HYV	High Yielding Varieties
IPM	Integrated Pest Management
IRRI	International Rice Research Institute
KS	Kala Shah Kaku
MINFA	Ministry of Food and Agriculture
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 2013-14 CROP

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Findings

1. Area and Production

a. Total production of rice from 2012-13 crop is estimated at 5.536 million tonnes, about 10 percent less than the production of 6.16 million tonnes in 2011-12.

b. Overall rice production in the country for the decade ending 2012-13 has increased @ 2.4 percent per annum based upon 1.9 percent improvement in yield and 0.5 percent expansion in area.

c. Basmati rice is entirely produced in the Punjab.

d. Bulk of the IRRI production comes from Sindh where 61 percent production is obtained from 51 percent Rice area, Punjab and Balochistan have shares of 29 and 20 percent in area and 25 and 14 percent in production.

e. 'Other' varieties of rice are shared by Punjab, Sindh and KPK with shares of 56, 38 and 6 percent.

2. Domestic Prices

a. Monthly wholesale market prices of basmati paddy ranged between Rs 1931 to Rs 2037 per 40 kgs in major rice producing area's markets.

b. IRRI paddy prices in the Punjab ranged between Rs 779 and Rs 860 per 40 kgs in the major rice area markets in post harvest season.

c. IRRI paddy prices in Sindh ranged between Rs 824 to Rs 938 per 40 kgs during post harvest in major rice producer markets

3. Cost of Production

a. Cost of cultivation of basmati paddy in 2013-14 is estimated at Rs 36614 per acre.

b. Cost of production of basmati paddy at market level would be Rs 1431 per 40 kgs.

c. The cost of cultivation of IRRI paddy in Sindh in 2013-14 is estimated at Rs 32042 per acre.

d. The market level cost of production of IRRI in Sindh would come to Rs 680 per 40 kgs.

4. Economics of Rice Paddy and Competing Crops

a. Rice is a kharif crop it competes with cotton for land, water and farm resources and inputs in area where conditions are favourable for both crops.

b. In the Punjab basmati performed better than cotton in terms of return to overall investment and crop duration while basmati was out performed by cotton in terms of return to purchased inputs and irrigation water.

c. IRRI paddy in the Punjab lagged behind all economic criteria against cotton except crop duration where IRRI paddy marginally performed better.

d. In Sindh rice performed better than cotton in terms of overall investment and crop duration while cotton performed better in case of return to purchased inputs and irrigation water.

e. Sugarcane performed better than all rice combinations in terms of all indicators except return to crop duration where basmati + sunflower rotation has edge in Punjab.

f. Sugarcane performed better in comparison with IRRI + Wheat and IRRI + Sunflower in all the criteria of analysis except crop duration where IRRI + Sunflower performed better in Sindh.

5. Real Prices

a. The real market prices of basmati paddy remained above the base year level except in 2005-06 indicating that market prices have been giving more benefits to farmer.

b. Market prices of IRRI paddy in Sindh were higher than base year price fixed by the government during the period under review.

6. World Situation

a. Rice production at global level in 2011-12 was estimated at 460 million tonnes, about 4.46 percent higher than last year's production and 0.2 percent lower than the forecast of rice production of 467 million tonnes in 2012-13.

b. The global rice trade in 2011-12 is reported at 38 million tonnes which was on an identical level in last year.

c. The world rice trade in 2012-13 is forecast at 37 million tonnes.

7. Export Parity Prices

a. During July 2012 to April 2013 international price of basmati rice paddy averaged at US $ 995 per tonne and export parity prices is worked out at Rs 2022 per 40 kgs.(Rs 50550 per tonne).

b. International prices of IRRI rice averaged at US $ 459 per tonne during July 2012 to April 2013. Export parity prices of IRRI paddy averaged at Rs 787 per 40 kgs.

8. Economic Efficiency

a. Economic efficiency of resources used in rice production have been evaluated by estimating the NPC, EPC and DRC.

b. NPC and EPC for basmati paddy have been less than one during the entire period of 2008-13 meaning there by that basmati producers have not received economic price of their produce.

c. Fluctuation in NPC and EPC for IRRI both in Punjab and Sindh indicates some protection to IRRI grower in the country.

d. DRC indicates the opportunity cost of domestic resources used in production of commodity. A DRC value of less than one indicates accordingly system having comparative advantage and vice verse.

e. DRC of basmati less than one during the period under review indicates comparative advantage in basmati production.

f. DRC of IRRI in Punjab is generally higher than one during the period under review indicates Punjab does not have comparative advantage in production of IRRI for export.

g. DRC of IRRI in Sindh has remained less than one during the period under review in producing IRRI for rice exports.

9. Policy Options

a. Based on the analysis of relevant factors covered in the main text of the Report, the likely policy options for rice paddy 2013-14 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 Basmati and IRRI rice**	
	i) Basmati	
	• During July-April 2012-13	2022
	• During April 2013	2183
	ii) IRRI	
	• During July-April 2012-13	787
	• During April 2013	769
B	**Domestic market prices of rice paddy during Oct-Feb 2012-13**	
	i) Super Basmati	1968
	ii) IRRI-6 Punjab	823
	iii) IRRI-6 Sindh	890
C.	**Cost of production at market level for 2013-14 crops**	
	i) Basmati	1431
	ii) IRRI Punjab	954
	iii) IRRI Sindh	680

Recommendation

In consultation with stakeholders in the API's Standing Committee meeting on rice paddy and visits to major rice producing areas recommendations regarding rice yield enhancement, rice marketing and intervention price of rice have been prepared.

a. Intervention Price of Rice (Paddy) 2013-14 Crop

Intervention price builds growers confidence in planting rice particularly in the scenario of declining rice production. The market prices of rice paddy remained at comfortable level for the growers in the past therefore the government did not intervene in rice market. No intervention price was announced in the past three years. Last time in 2009-10 the prices announced were Rs 1000, 1250 and Rs 600 per 40 kgs for Basmati 385, Basmati super/2000 and IRRI-6 paddy.

In API's Standing Committee meeting on Rice (paddy) the grower members expressed their serious reservations over non-announcement of intervention price. They were of the view it provides a floor to the market. It is therefore in the fitness of things that the government may like to consider suitable price of rice (paddy) covering the cost of inputs and considering the economics of competing crops may be announced for the 2013-14 crop. However the actual incentive to paddy growers should come through market forces including export price.

PASSCO should be designated as implementing agency for procurement of rice paddy at the intervention price announced by the government. PASSCO well equipped with pre-requisites should enter the market well in time. Keeping in view the harvesting times of rice (paddy) in different agro-ecological areas.

b. Improving Productivity

i) Use of certified seed be encouraged through provincial seed councils.

ii) Hybrid variety of rice which suits to the condition of Sindh may be evolved at local level.

iii) Hybrid varieties of seed are in great demand due to extra ordinary yield. Their cost is high that may be rationalized.

iv. Due to climate change water scarcity is increasing. Efforts should be made for evolving rice varieties which consume less water.

v. Fertilizer prices be printed on the bags and fertilizer supply be ensured at the time of sowing of rice.

vi. Rice nursery should not be sown before May this would facilitate in harvesting monsoon rain water and reducing production cost.

vii. Pest scouting be strengthened by extension staff by creating awareness and training.

viii. Balanced use of fertilizer be publicized through extension staff.

ix. Awareness of farming community be made for global GAP certified produce to have better understanding of it.

x. A breeders award be ensured for new HYV varieties.

Improving Marketing

i) PARC scientists involved in Research and Development of Rice may expedite the generation of varieties which are required in the international market.

ii) Paddy dryers may be made available to farmers in order to make paddy according to the demand of the market.

iii) Quality of rice may be improved per specification of the export market.

iv) Farmers be sent on visit/training in rice paddy centres by provincial agriculture departments.

v) Rice zones must be declared and rice shellers be modernized

vi) Researcher/scientists may make efforts to focus on new rice product based on steam technology

vii) Quality of rice be improved for export according to market demand.

RICE POLICY ANALYSIS FOR 2013-14

1. INTRODUCTION

1.1 Rice is an important pillar of food security after wheat. Pakistan produces rice to feed the domestic population as well as to export it to earn foreign exchange. The cropped area under rice at 2.3 million hectares ranks third after 9 million hectare wheat and 3 million hectare cotton area. 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. Basmati is long grain aromatic variety entirely produced in Punjab. Sindh leads in IRRI production and Punjab in 'Other' varieties production. However, rice is cultivated in all the 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.

1.2 Rice production was at its peak at 6.952 million tonnes in 2008-09. In 2009-10 it was 6.883 million tonnes. The production is on the decline and in 2012-13 it is estimated at 5.36 million tonnes from 2.3 million hectares. Main reason for decline is the unfavourable weather condition due to climate change including floods and torrential rains. The lower production caused a significant increase in the price of commodity at the local market. And higher price did not encourage exporters to sell higher quantity of rice in the markets abroad. Pakistan is no longer competitive in the international rice market as India and Vietnam are selling rice at lower prices. During 2012-13 rice exports earned $ 1.84 million compared to 2.08 billion in 2011-12. India produces subsidized rice and further subsidies it for exports in the name food security which limits competitiveness of small producing countries.

1.3 The price received for Basmati is $ 993 in 2012-13 compared to $ 880/tonnes in 2011-12 but the quantity exported is 36 percent down compared to previous year. The other varieties exports were 4 percent up but their value was 2 percent down. Pakistan rice exports are of the order of 3 million tonnes. We have to keep it up by having GAP certification at farm level and HACCP certification at processing stage. The efforts should be made that our Basmati and non-Basmati markets remain intact.

1.4 We should protect Pakistani rice exports and invest in research, pest eradication, storage, improvement in yield and develop varieties which consume less water.

2. SOWING AND TRANSPLANTING OF RICE PADDY

2.1 Rice crop in Pakistan is mostly sown by transplanting of seedlings raised in nurseries. Direct seeding is also practiced on a limited scale in areas where weed is not a problem. The sowing times 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

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

3. REVIEW OF 2012-13

3.1 Provincial Shares in Area and Production

3.1.1 Based on the average of **2010-11 to 2012-13**, annual production of rice worked out at 5.506 million tonnes from the average area of 2.415 million hectares (5.968 million acres). Varietal break-up of rice production **(Table-2)** shows that Punjab is best suited due to agro climatic conditions in production of basmati rice. Punjab is the sole producer of basmati rice in the country. In the total production of IRRI; Punjab, Sindh, and Balochistan are contributing 25.2, 61.2 and 13.6 per cent, respectively. In 'Others' varieties of rice respective shares of Punjab, Sindh and Khyber Pakhtunkhwa are 56.2, 38.2 and 5.6 per cent.

Table-2: Provincial Shares in Area and Production of Rice: Average of 2010-11 to 2012-13 Crops

Variety	Pakistan		Punjab	Sindh	KPK	Balochistan
Area (000 hectares)		**Per cent**	**----------Per cent----------**			
Total	**2415.1 (5968.0)**	**100.0**	**71.7**	**20.8**	**2.0**	**5.5**
Basmati	1150.0 (2841.7)	47.6	100.0	-	-	-
IRRI	662.4 (1636.9)	27.4	29.0	50.9	-	20.1
Other	602.7 (1489.6)	25.0	64.5	27.5	8.0	-
Production	**(000 tonnes)**	**Percent**	**----------Per cent----------**			
Total	**5506.5**	**100.0**	61.4	32.3	1.6	4.7
Basmati	2004.1	36.4	100.0	-	-	-
IRRI	1915.6	34.8	25.2	61.2	-	13.6
Other	1586.8	28.8	56.2	38.2	5.6	-

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

3.1.2 The provincial shares of Punjab, Sindh, Khyber Pukhtoonkhowa and Balochistan in area under rice crop are 71.7, 20.8, 2.0 and 5.5 per cent, respectively. Basmati accounts for

47.6 per cent of the total area, IRRI and 'Others' varieties are grown on 27.4 and 25.0 per cent area. Province-wise and variety-wise shares in production are given in Fig-1 and 2.

3.2 Changes in Area, Yield and Production

3.2.1 The area under rice crop during 2002-03 to 2012-13 has ranged between 2.225 and 2.962 million hectares (5.499 to 7.321 million acres) and production oscillated between 4.479 and 6.952 million tonnes (Annex-I & I-A). The yield during this period fluctuated between 1970 to 2398 kgs per hectare (797 to 970 kgs per acre). Long and short term changes in area, yield and production of rice are discussed below:

a. Long terms changes: 2002-03 to 2012-13

3.2.2 During the decade ending 2012-13, production of rice at country level is estimated to have increased @ 2.4 per cent per annum as a cumulative effect of increase in yield by 1.9 per cent and expansion in area by 0.5 per cent.

Table-3: Average Annual Growth Rates of Area, Yield and Production of Rice: 2002-03 to 2012-13

Country/ Province	Variety	Area	Yield	Production
		----------Per cent per annum----------		
Pakistan	**All varieties**	**0.5**	**1.9**	**2.4**
	Basmati	-2.5	0.8	-1.7
	IRRI	-1.5	1.3	-0.3
	Others	14.6	4.4	19.7
Punjab	**All varieties**	**0.9**	**1.7**	**2.7**
	Basmati	-2.5	0.8	-1.7
	IRRI	5.5	2.3	8.0
	Others	20.4	0.2	20.7
Sindh	**All varieties**	**0.1**	**3.6**	**3.7**
	IRRI	-3.5	2.5	-1.1
	Others	16.0	16.4	35.0
KPK	**All varieties**	**-2.6**	**-1.5**	**-4.1**
Balochistan	**All varieties**	**-6.0**	**-1.7**	**-7.5**

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

Fig-1: VARIETAL SHARES IN PRODUCTION OF RICE: AVERAGE OF 2010-11 TO 2012-13

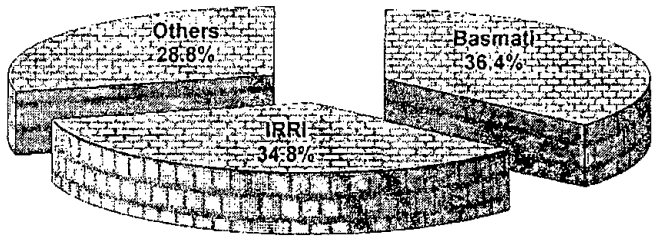
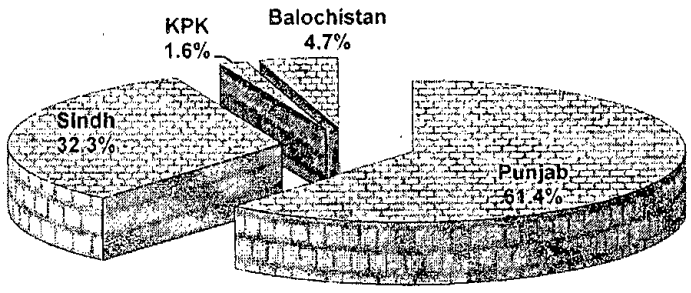


Fig-2: PROVINCIAL SHARES IN PRODUCTIN OF RICE: AVERAGE OF 2010-11 TO 2012-13



3.2.3 Annual growth of rice production in the Punjab during the period 2002-03 to 2012-13 remained 2.7 per cent as result of 1.7 per cent per annum increase in yield and 0.9 per cent per annum in area. The area and production of basmati rice has decreased by 2.5 and 1.7 per cent per annum. However, the yield increased by 0.8 per cent per annum. The production of IRRI has increased by 8.0 per cent annually due to 5.5 and 2.3 percent per increase in area and yield. The production of 'Other' varieties has increased by 20.7 per cent per annum because of 20.4 per cent expansion in area and 0.2 per cent rise in yield. Area has decreased due to climate change and successive floods from 2010 onwards.

3.2.4 In Sindh, where only coarse varieties are cultivated, rice production during the period under reference is estimated to have increased @ 3.7 per cent annually due to 0.1 per cent expansion in area and 3.6 per cent rise in yield.

3.2.5 In the Khyber Pakhtunkhwa, the production of rice has decreased by 4.1 per cent annually due to 2.6 and 1.5 percent per annum decreases in area and yield.

3.2.6 In Balochistan, rice production during the period under reference has recorded average annual reduction of 7.5 per cent due to decrease in area and yield by 6.0 and 1.7 percent.

b. Short-terms changes: 2011-12 vs 2012-13

3.2.7 According to the Final estimates, rice production estimated at 5.536 million tonnes in 2012-13 is 10.1 per cent lower than last year's production of 6.160 million tonnes (Table-4). The production has decreased by 10.1 per cent mainly based upon in the decrease in area by 10.2 per cent. The yield, however, has increased by 0.07 percent. The changes in area, yield and production by province and by variety in 2012-13 in relation to 2011-12 are given in **Table-4**.

Table-4: Area, Yield and Production of Rice by Variety: 2011-12 and 2012-13 Crop

Country/ Pakistan	Area		Change	Yield		Change	Production		Change
	2011-12	2012-13		2011-12	2012-13		2011-12	2012-13	
	000 hectares		Percent	Kgs/hectare		Percent	000 tonnes		Percent
Pakistan	**2571.2**	**2308.8**	**-10.20**	**2396**	**2398**	**0.07**	**6160.4**	**5535.9**	**-10.14**
Basmati	1121.0	995.1	-11.23	1685	1767	4.84	1889.1	1758.1	-6.93
IRRI	759.7	579.1	-23.77	3202	3140	-1.91	2432.3	1818.6	-25.23
Others	690.5	734.6	6.39	2663	2667	0.14	1839.0	1959.2	6.54
Punjab	**1714.2**	**1711.4**	**-0.16**	**1912**	**2032**	**6.31**	**3277.0**	**3478.0**	**6.13**
Basmati	1121.0	995.1	-11.23	1685	1767	4.84	1889.1	1758.1	-6.93
IRRI	183.3	210.0	14.57	2491	2607	4.64	456.6	547.4	19.89
Others	409.9	506.3	23.52	2272	2316	1.93	931.3	1172.5	25.90
Sindh	**635.8**	**511.1**	**-19.61**	**3555**	**3608**	**1.49**	**2260.1**	**1843.9**	**-18.42**
IRRI	405.3	331.6	-18.18	3570	3471	-2.78	1447.1	1151.0	-20.46
Other	230.5	179.5	-22.12	3528	3860	9.43	813.0	692.9	-14.77
KPK	**50.1**	**48.8**	**-2.59**	**1890**	**1922**	**1.69**	**94.7**	**93.8**	**-0.95**
Balochistan	**171.1**	**37.5**	**-78.08**	**3089**	**3205**	**3.75**	**528.6**	**120.2**	**-77.26**

Source: Annex-I.

3.2.8 In the Punjab, overall production of rice has shown an increase of 6.1 per cent during 2012-13 as compared to 2011-12. The increase in production occurred mainly due to increase in yield by 6.3 per cent but the area has decreased by 0.2 per cent. Production of basmati decreased by 6.9 percent because of decrease in area by 11.23 per cent despite 4.8 percent improvement in yield, IRRI varieties has shown an increase of 19.9 per cent in production mainly due to increase of 14.6 and 4.6 per cent in area and yield. Production of 'Other' varieties has increased by 25.9 per cent because of increase in area by 23.5 percent and 1.9 percent in yield.

3.2.9 In Sindh, overall production of rice has decreased by 18.4 per cent mainly due to decrease in area by 19.6 percent despite increase of 1.5 percent in yield over last year.

Production of IRRI also decreased by 20.5 percent mainly due to increase in area and yield by 18.2 and 2.8 per cent. Production of "Other" varieties has decreased by 14.8 per cent due to decrease in area by 22.1 percent in area but the yield increased by 9.4 per cent.

3.2.10 In the Khyber Pakhtunkhwa rice production decreased by 0.9 percent mainly due to the area under rice crop has also decreased by 2.6 per cent during 2012-13 as compared to 2011-12. However the yield of rice is increased by 1.7 percent during the period under reference.

3.2.11 In Balochistan, where IRRI varieties of rice are grown, production of rice is decreased by 77.3 per cent due to decrease in area of rice in the province by 78.1 per cent in 2012-13 compared to 2011-12.

3.2.12 Agriculture Department of Punjab and Sindh has provided following reasons regarding change in area and production of rice for 2012-13 crop:

Punjab

- **Area**

  Decrease in area is due to electricity load shedding and delay in monsoon.

- **Production**

1. Adequate supply/availability of inputs.
2. Intermittent rains at appropriate intervals.

Sindh

- **Area**

  The area under Rice crop decreased due to heavy monsoon rain and also influx of rainy water from Balochistan, main paddy growing districts i.e. Jacobbabad, Kashmore, Qamber, Shahdad Kot, Shikarpur and Larkana were severely affected, resultantly, area under the Rice crop was damaged at large scale.

- **Production**
  1. Production decreased due to decrease in area.
  2. Standing of rain water for prolonged period, in rice fields, particularly Jacobabad, Kashmore & Shikarpur Districts, affected the standing crop, which resulted in less yield per acre and alternately over all production decreased.

3.3 Targets Vs Achievements: 2012-13 Crop

3.3.1 For 2012-13 crop, the concerned Provincial Agriculture Departments of Punjab and Sindh and last three years average of KPK and Balochistan had set target of rice area and production at 2.566 million hectares and 5.709 million tonnes. According to final estimates provided by provincial Agricultural Departments, the area and production estimated at 2.309 million hectares and 5.534 million tonnes is lower than the target by 10.0 and 3.0 per cent respectively. The area and production of Basmati has also remained below the target by 12.8 and 9.8 per cent but yield remained up the target by 3.4 percent **(Table-5)**. The area of IRRI and 'Other' varieties of rice remained below the target by 7.8 percent but yield and production are up to the target by 9.0 and 0.5 percent, respectively.

Table-5: Targets and Estimated Achievements of Area, Yield and Production of Rice: 2012-13 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	**2566.1**	**2308.8**	**-10.03**	**2225**	**2398**	**7.77**	**5709.0**	**5535.9**	**-3.03**
Basmati	1141.2	995.1	-12.80	1709	1767	3.40	1950.0	1758.1	-9.84
IRRI/Others	1424.9	1313.7	-7.80	2638	2876	9.01	3759.0	3777.8	0.50
Punjab	**1740.1**	**1711.4**	**-1.65**	**1896**	**2032**	**7.16**	**3300.0**	**3478.0**	**5.39**
Basmati	1141.2	995.1	-12.80	1709	1767	3.40	1950.0	1758.1	-9.84
IRRI/Others	598.9	716.3	19.60	2254	2401	6.52	1350.0	1719.9	27.40
Sindh (IRRI/Others)	**645.0**	**511.1**	**-20.76**	**3194**	**3608**	**12.96**	**2060.0**	**1843.9**	**-10.49**
KPK (Others)	**48.0**	**48.8**	**1.67**	**1854**	**1922**	**3.67**	**89.0**	**93.8**	**5.39**
Balochistan (IRRI)	**133.0**	**37.5**	**-71.80**	**1955**	**3205**	**63.97**	**260.0**	**120.2**	**-53.77**

Sources:

1. **After the devolution of MINFA and FCA crop production targets are not made at federal level.**
2. **For targets: (a) Concerned Provincial Agriculture Departments of Punjab and Sindh**
   (b) Average estimates of area & production of last three years for KPK and Balochistan
3. **For achievements: Annex-I**

3.3.2 Area targets have not been achieved in the Punjab, Sindh, and Balochistan by 1.7, 20.8, and 71.8 per cent respectively except Khyber Pakhtunkhwa which has achieved the target by 1.7 percent. Production of Punjab and Khyber Pakhtunkhwa surpassed the target by each 5.4 per cent, but Sindh and Balochistan have not achieved the target by 10.5 and 53.8 per cent, respectively. Yield of Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan has surpassed the target by 7.2, 13.0, 3.7 and 64.0 per cent, respectively. Targets and achievements of area, yield and production of rice by province and variety are depicted in Fig-3 and Fig-4.

3.4 Important Rice Producing Districts

3.4.1 Districts producing more than 50 thousand tonnes of rice include Gujranwala, Sheikhupura, Sialkot, Okara, Hafizabad, Nankana Sahib, Kasur, Narowal, M.B. Din, Bahawalnagar, Pakpattan, Jhang, Sargodha, D.G. Khan, Gujrat, Chiniot, Lahore, and T.T. Singh from the Punjab, Larkana, Shikarpur, Qamber, Badin, Thatta, Kashmore, Jacobabad, and Dadu from Sindh and Jafarabad and Nasirabad from Balochistan. These 28 districts collectively produced 89.2 per cent of total production of rice. Main basmati producer districts which contribute about 58.4 per cent of the total basmati are Gujranwala, Sheikhupura, Sialkot, Hafizabad, Nankana Sahib, Narowal, and M.B. Din While 62.8 per cent of the total IRRI rice is contributed by Larkana, Shikarpur, Qamber, Thatta, Nasirabad and Jafarabad, these districts are above 100 thousand tonnes producers. Districts, based on 2010-11 to 2012-13 average, are arranged in descending order of rice production, with varietal break-up in **Annex-II**.

4. DOMESTIC DEMAND, SUPPLY AND PRICE SITUATION OF RICE

4.1 Domestic Demand and Supply of Rice

4.1.1 Based on annual per capita availability of rice averaging at 15.03 kgs during the period 2009-10 to 2011-12 **(Annex-III)**, the domestic consumption requirement in 2012-13 for population of 191.31 million has been estimated at 2875 thousand tonnes. Against this requirement, total production of rice in the country from 2012-13 crop has been

PROVINCE-WISE TARGET AND ACHIEVEMENT IN PRODUCTION OF RICE: 2012-13 CROP

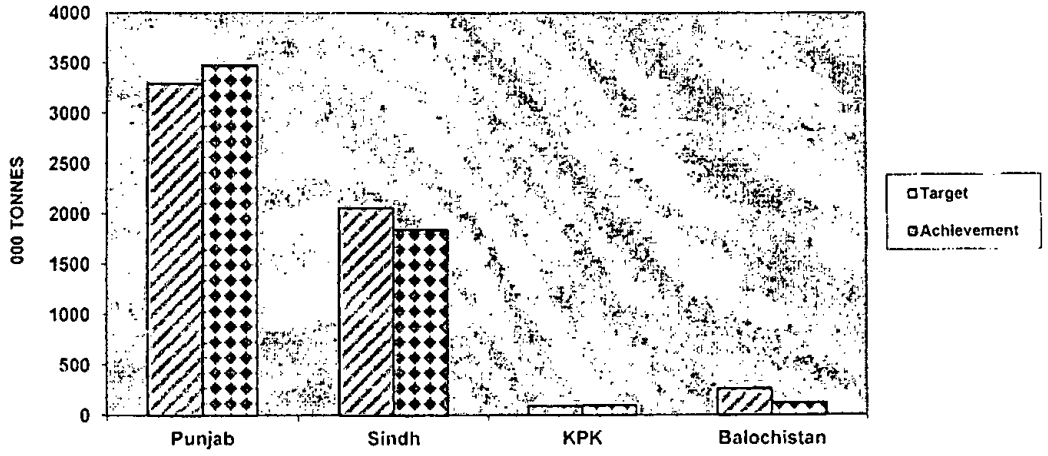


Figure-3

TARGET AND ACHIEVEMENT AT NATIONAL LEVEL IN VARIETAL PRODUCTION OF RICE: 2012-13 CROP

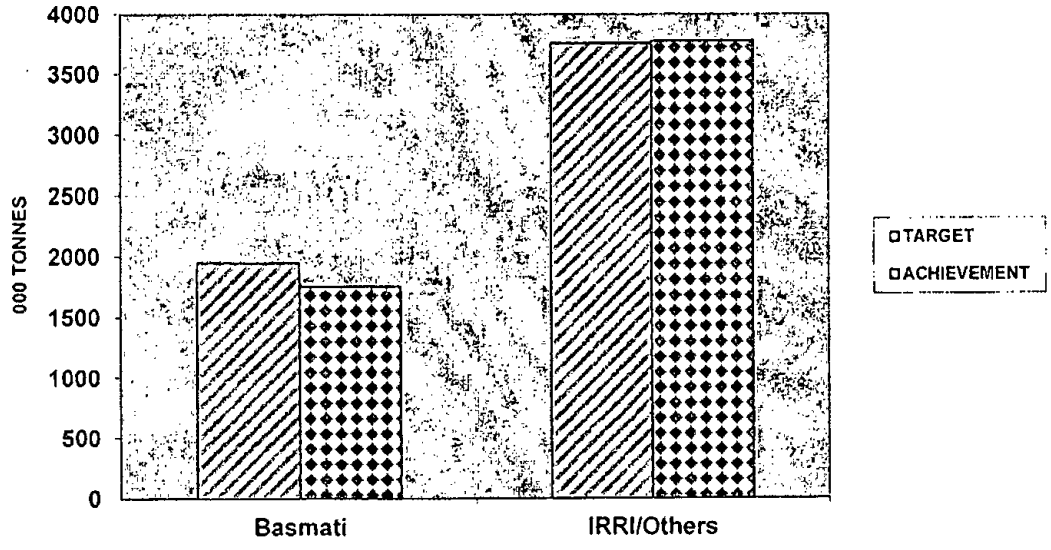


Figure-4

reported at 5536 thousand tonnes. Taking the allowance for seed and wastage @ 6 per cent of the production (332 thousand tonnes), the net available rice for consumption and trade comes to 5204 thousand tonnes. Thus Pakistan has an export surplus of 2796 thousand tones, after accounting for domestic requirement of 2875 thousand tones.

4.2 Domestic Prices of Rice Paddy

4.2.1 The wholesale market prices of basmati paddy as presented in **Table-6** have ranged between Rs 1757 per 40 kgs in Hafizabad market during October 2012 and Rs 2257 40 kgs in Gujranwala market during February 2013. The seasonal average prices of basmati in the Punjab have ranged between Rs 1931 and Rs2037 per 40 kgs.

Table-6: Monthly Average Wholesale Prices of Basmati Paddy in Major Producer Area Markets of the Punjab: 2012-13 Crop

Markets	Oct	Nov	Dec	Jan	Feb	Average
	----------Rupees per 40 kgs.----------					
Gujranwala	1780	1795	1810	2015	2257	**1931**
Hafizabad	1757	1855	1875	1990	2175	**1930**
Sialkot	1811	1825	2025	2065	2210	**1987**
Narrowal	1760	1765	2000	2085	2167	**1955**
Sheikhupura	1820	1925	2100	2123	2218	**2037**
Average	**1786**	**1833**	**1962**	**2056**	**2205**	**1968**

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

4.2.2 The average wholesale market prices of IRRI Paddy **(Table-7)** have ranged between Rs 728 to 975 40 kgs in various markets of Punjab and Sindh during the post-harvest period 2012-13 crop.

Table-7: Monthly Average Wholesale Prices of IRRI-6 Paddy in Major Producer Area Markets of the Punjab and Sindh during 2012-13

Markets	Oct	Nov	Dec	Jan	Feb	Average
	----------Rs per 40 kgs----------					
Punjab						
Sargodha	860	-	-	-	-	**860**
Multan	729	802	870	936	826	**833**
Okra	801	775	816	728	774	**779**
D.G Khan	823	794	815	825	852	**822**
Average	**803**	**790**	**834**	**830**	**817**	**823**
Sindh						
Thatta	-	838	850	800	850	**834**
Dadu	-	870	875	860	890	**874**
Larkano	-	875	925	975	975	**938**
Shikarpur	-	890	880	925	925	**905**
Jaccobabad	-	-	935	875	935	**915**
Qambar Shahdadkot	-	875	925	975	975	**938**
Ghotki	-	875	800	810	810	**824**
Average	-	**870**	**884**	**889**	**909**	**890**

Source: 1) Directorate of Agriculture (E&M) Punjab, Lahore.
2) Market Committees, Sindh.

5. COST OF PRODUCTION OF RICE PADDY

5.1 In formulating support/indicative price proposals of farm commodities, the cost of production is one of the substantial considerations. However, its realistic evaluation is surrounded with many conceptual problems and practical difficulties because of extensive disparity in the use of inputs and crop husbandry practices across the regions, resulting in substantial variations in yields. Under such diverse farming conditions, the estimation of a typical cost of production is somewhat challenging.

5.2 The cost of production of various varietals groups of rice paddy for the 2013-14 crop in the Punjab and Sindh have been rationalized by adopting the input-output parameters as used in calculation of cost of production estimates for the 2012-13 crop along-with the current farm

inputs prices and hiring rates of field operations obtained through an annual field survey conducted by API in the major rice producing districts of Sindh during May 2013. These rates were also harmonized with the information provided by the participants of Provincial Agriculture Departments, Farmers' Associations and Kissan/Abadgar Boards in the meeting of API's Standing Committee on rice, held on June 12, 2013 at the Pakistan Agriculture Research Center's Auditorium, Islamabad. The detailed COP estimates for rice paddy for the Punjab and Sindh are provided at Annex-IV to VI, while a summary of the result is given in **Table-8.**

5.1 Average Farmers' Cost of Production of Rice Paddy: 2012-13 and 2013-14 Crops

5.1.1 The likely cost of production estimates of basmati and IRRI in the Punjab and IRRI in Sindh during 2012-13 and 2013-14 crops are summarized and presented in **Table-8.**

Table-8: Average Farmers' Cost of Production of Rice (Paddy): 2012-13 and 2013-14 crops

Item	Unit	Cost estimates		Increase in 2013-14 over 2012-13
		2012-13 crop	2013-14 crop	
Punjab	**Basmati**			
1. Net cost of cultivation	Rs/acre	34279	36614	2335
2. Yield	Kgs/acre	1053	1053	-
3. Cost of production at farm level	Rs/40 kgs	1302	1391	89
4. Marketing cost i.e. loading, transport, commission etc.	"	35	40	5
5. Cost of production at market level	"	1337	1431	94
	IRRI			
1. Net cost of cultivation	Rs/acre	33388	34492	1104
2. Yield	Kgs/acre	1510	1510	-
3. Cost of production at farm level	Rs/40 kgs	884	914	30
4. Marketing cost i.e. loading, transport, commission etc.	"	35	40	5
5. Cost of production at market level	"	919	954	35
Sindh	**IRRI**			
1. Net cost of cultivation	Rs/acre	30013	32042	2029
2. Yield	Kgs/acre	2004	2004	-
3. Cost of production at farm level	Rs/40 kgs	599	640	41
4. Marketing cost i.e. loading, transport, commission etc.	"	35	40	5
5. Cost of production at market level	"	634	680	46

Source: Annex-IV to VI.

Punjab

- **Basmati**

5.1.2 The Table-8 above reveals that during 2013-14 crop, raising one acre of basmati paddy in the Punjab is likely to cost to Rs 36614, including land rent. Based on the average yield of 1053 kgs per acre, Ex-farm level cost of production would be Rs 1391 per 40 kgs. Accounting for marketing cost @ Rs 40 per 40 kgs, the cost of production at the market/sheller level would come to Rs 1431 per 40 kgs, reflecting an increase of Rs 94 per 40 kgs or 7 per cent over last year's corresponding cost of Rs 1337 per 40 kgs.

- **IRRI**

5.1.3 During 2013-14 crop year, the cost of cultivation of IRRI paddy in Punjab is likely to cost Rs. 34492 per acre, including land rent. Based on the average yield of 1510 kgs per acre, the farm level cost of production would be Rs 914 per 40 kgs. Adding for marketing cost @ Rs 40/40 kgs, the market/sheller level cost of produce would be Rs 954 per 40 kgs, showing an increase of Rs 35 or 4 per cent over the previous year's corresponding cost of Rs 919 per 40 kgs.

- **Sindh**

5.1.4 The cost of cultivating one acre of IRRI paddy in Sindh during 2013-14 is estimated at Rs 32042, including land rent. The farm level cost of production works out at Rs 640 per 40 kgs, given the average yield of 2004 kgs per acre. Adding marketing cost @ Rs 40 per 40 kgs, the cost of IRRI paddy at the market/sheller level would be Rs 680 per 40 kgs, elevated by Rs 46 per 40 kgs (7 per cent) than the corresponding cost of production of Rs 634 per 40 kgs of last year.

5.1.5 The primary reasons for the likely increased cost of production of rice paddy for the 2013-14 crop in the Punjab and Sindh are higher hiring rates of cultural operations i.e. ploughing and tube-well irrigation. The rises in the land rental, harvesting/threshing charges (basmati in the Punjab and IRRI in Sindh) and wage rates have also added to increase in the cost of production. However, decrease in the prices of DAP and Urea, lower charges of harvesting and threshing of IRRI paddy in Punjab and increased value of paddy straw have partially offset the increase in the cost of production of rice paddy for 2013-14 crop.

5.2 Cost of major operations/inputs

5.2.1 The shares of different field operations and farm inputs in the total cost of cultivation of rice paddy in the Punjab and Sindh during 2012-13 and 2013-14 crops along-with percent changes therein is presented in **Table-9**.

Table-9: Cost of Major Operations/Inputs of Rice Paddy: 2012-13 and 2013-14 Crops

Operations/inputs	2012-13 crop	2013-14 crop	Shares in increased cost
	(Rs/acre)		(Per cent)
Punjab	**Basmati**		
1. Land preparation	4750 (12)	5150 (13)	12
2. Nursery/uprooting and transplanting	3445 (9)	3829 (9)	12
3. Weeding	530 (1)	606 (1)	2
4. Plant protection	472 (1)	511 (1)	1
5. Irrigation	10241 (26)	10754 (25)	15
6. Fertilizer including FYM	5338 (14)	5313 (13)	(-) 1
7. Land rent	9000 (23)	9500 (22)	15
8. Harvesting and threshing etc	3101 (8)	4285 (10)	36
9. Others	2402 (6)	2666 (6)	8
10. Total cost	39279 (100)	42614 (100)	100
	IRRI		
1. Land preparation	4350 (12)	4725 (13)	23
2. Nursery/uprooting and transplanting	3445 (10)	3728 (10)	18
3. Weeding	729 (2)	829 (2)	6
4. Plant protection	487 (1)	528 (1)	3
5. Irrigation	6143 (17)	6553 (17)	26
6. Fertilizer including FYM	7027 (19)	7005 (18)	(-) 1
7. Land rent	9000 (25)	9500 (25)	31
8. Harvesting and threshing etc	2961 (8)	2626 (7)	(-) 21
9. Others	2246 (6)	2498 (7)	16
10. Total cost	36388 (100)	37992 (100)	100
Sindh	**IRRI**		
1. Land preparation	5850 (18)	6350 (19)	20
2. Nursery/uprooting and transplanting	4500 (14)	4940 (14)	17
3. Weeding	730 (2)	852 (2)	5
4. Plant protection	412 (1)	453 (1)	2
5. Irrigation	2088 (6)	2386 (7)	12
6. Fertilizer including FYM	6246 (19)	6212 (17)	(-) 1
7. Land rent	7500 (22)	8000 (23)	20
8. Harvesting and threshing etc	3535 (11)	3937 (11)	15
9. Others	2152 (7)	2412 (7)	10
10. Total cost	33013 (100)	35542 (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**

5.2.2 In the total cost of cultivation of basmati paddy in the Punjab for the 2013-14 crop, irrigation is the most important component, accounting for 25 per cent. The other principal constituents are: Land rent (22 %), Fertilizers including FYM and land preparation (13 % each), Harvesting/ threshing operations (10%) and Nursery and related operation (9 %).

- **IRRI**

5.2.3 Land rent is the major component of the cost of cultivation of IRRI paddy in the Punjab during 2013-14 crop year, accounting for 25 per cent. The other chief constituents are: Fertilizer including FYM (18 %), Irrigation (17 %), land preparation (13 %), Nursery and related operations (10 %) and Harvesting/threshing (7 %).

Sindh

5.2.4 In Sindh, land rent is the prime ingredient of the cost of cultivation of IRRI paddy during 2013-14 crop year, contributing 23 per cent. The other principal components are: land preparation (19 %), Fertilizers including FYM (17 %), Nursery and related operations (14 %), Harvesting/threshing operations (11 %) and Irrigation (7 %).

6. ECONOMICS OF RICE PADDY AND COMPETING CROPS

6.1 Resource allocation among competing crops 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.

6.2 The economics of rice and competing crops has been analyzed in terms of input-output prices paid and received by the growers for the 2012-13 crops. A summary of the relevant

economic indicators emerging from the analysis is presented in **Table-10**. The details of the analysis are provided in Annex-VII and depicted by Figures 5 and 6.

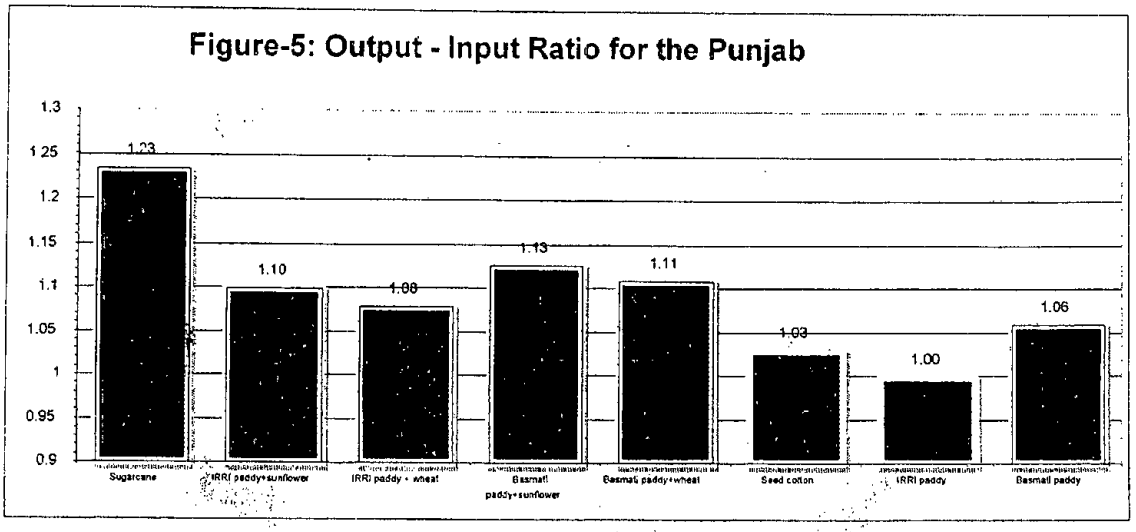
Table-10: Economics of Rice and Competing Crops at Prices Realized by the Growers in the Punjab: 2012-13 Crops

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	1.06	2.17	231	717
2. IRRI paddy	1.00	2.15	202	586
3. Cotton	1.03	2.83	199	2176
4. Basmati+wheat	1.11	2.44	219	1126
5. Basmati+sunflower	1.13	2.46	236	1062
6. IRRI+wheat	1.08	2.45	204	994
7. IRRI+sunflower	1.10	2.47	221	949
8. Sugarcane	1.23	3.84	225	1846

Source: Annex-VII.

Punjab

6.3 Basmati paddy performed better than cotton in terms of returns to overall investment and crop duration during the current season, while basmati has been out performed by cotton in terms of returns to purchased inputs and irrigation water. As far as the performance of IRRI paddy is concerned, the cotton cultivation has outcompeted IRRI in terms of all the economic criteria adopted in this analysis except crop duration where IRRI paddy marginally performed better.



6.4 In case of indirect competition, sugarcane performed better than all the rice combinations in terms of all economic indicators used in this analysis except returns to crop duration where the basmati + sunflower rotation has edge over sugarcane. Rice combinations with wheat have lower returns to farmers than rice combinations with sunflower in terms of all economic indicators used in this analysis except irrigation water in basmati + wheat combination.

Sindh

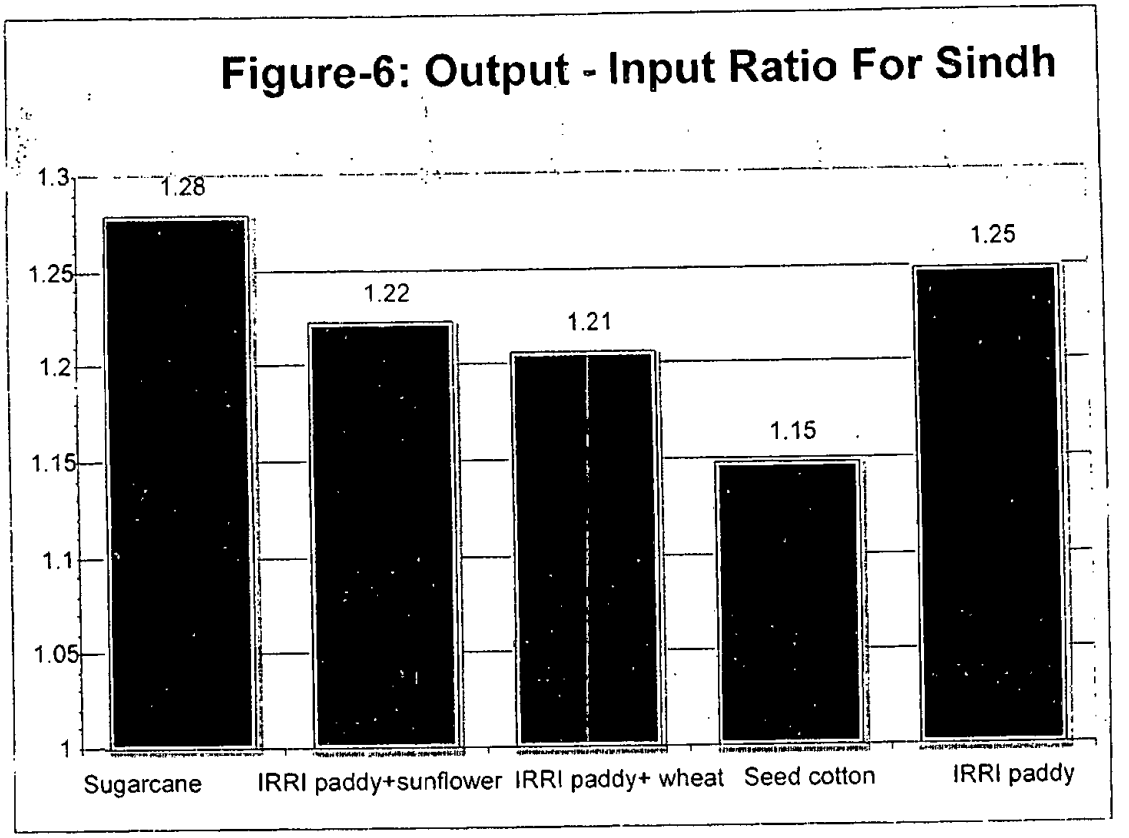
6.5 In Sindh, rice farming has performed better results as compared to the cotton crop. Rice farmers received higher returns to overall investment and crop duration, while the cotton farming performed better in case of returns to purchased inputs and irrigation water.

Table- 11: Economics of IRRI Paddy and Competing Crops at Prices Realized by the Growers in Sindh: 2012-13 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	1.25	3.27	229	736
2. Cotton	1.15	3.33	204	2713
3. IRRI+wheat	1.21	3.04	206	1092
4. IRRI+sunflower	1.22	3.02	235	1085
5. Sugarcane	1.28	3.80	223	1530

Source: Annex-VII.

6.6 In case of indirect competition with sugarcane, the economic position of both IRRI+ wheat and IRRI + sunflower rotations is weaker for this season as their performance have been lower than sugarcane in all the criteria adopted for the current analysis except returns to crop duration where the performance of IRRI + sunflower combination has been much better than sugarcane.



7. NOMINAL AND REAL MARKET PRICES OF BASMATI AND IRRI PADDY: 2000-01 TO 2012-13

7.1 To analyse the overtime changes in the purchasing power of basmati and IRRI paddy, the nominal and real market prices of rice paddy for the period 2000-01 to 2012-13 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: 2000-01 to 2012-13

Crop year	Nominal Market Prices		Consumer Price Index (CPI)	Real Market Prices	
	Basmati	IRRI-6		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	
2000-01	410	180	100.00	410.00	180.00
2001-02	470	205	103.54	453.93	197.99
2002-03	502	218	106.75	470.26	204.22
2003-04	505	257	111.63	452.39	230.22
2004-05	560	338	121.98	459.09	277.09
2005-06	537	290	131.64	407.93	220.30
2006-07	594	310	141.87	418.69	218.51
2007-08	920	509	158.90	578.98	320.33
2008-09	1183	585	191.90	616.47	304.85
2009-10	1097	666	214.41	511.64	310.62
2010-11	1325	935	244.26	542.45	382.79
2011-12	1424	798	258.32	551.25	308.92
2012-13	1653	875	285.34	579.31	306.65

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, 2012-13.
ii) Directorate of Agriculture, (E&M), Lahore, Punjab.
iii) Directorate of Agriculture Farms and Major Crops Development, Hyderabad, Sindh.

Fig-7 Nominal and Real Market Prices of Basmatti Paddy in the Punjab:2000-01 to 2012-13

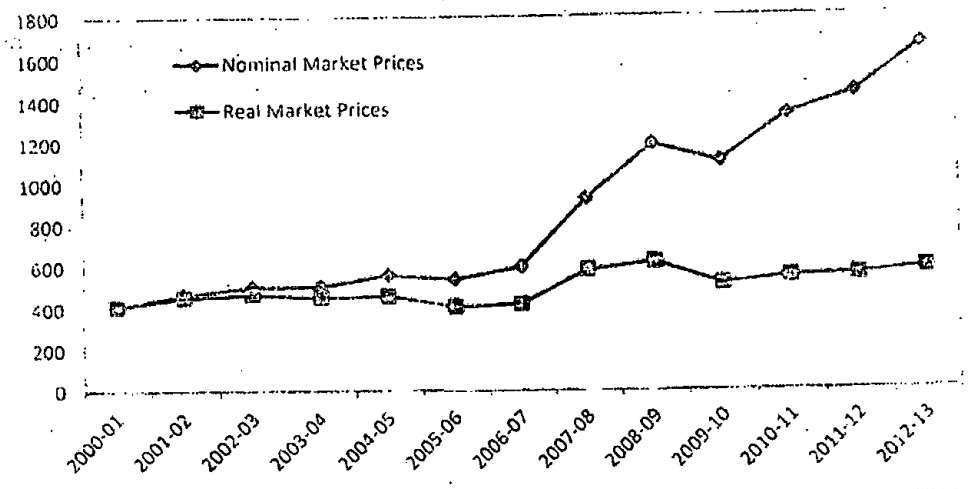
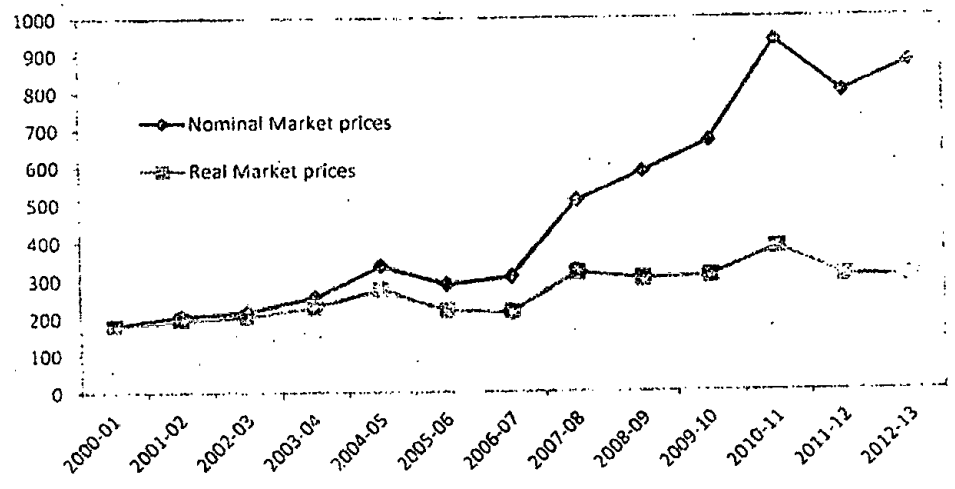


Fig-8 Nominal and Real Market Prices of IRRI-6 Paddy in Sindh: 2000-01 to 2012-13



7.2 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

7.3 The data in Table-12 reveals that the nominal market price of Basmati paddy has evidenced 303 per cent overall increase against the base year during the period under review while its real value improved only by 41 per cent. The major reason for this slow increasing trend in the real purchasing power of the crop is the 185 per cent general inflation observed in the economy during the same period.

7.4 For the entire period under review, the real market price remained above the base year level except in 2005-06, where it slightly fell below the base year level. The year 2008-09 proved as the best crop season for the rice growers as they fetched the highest real price of Rs.616/- per 40 kgs in terms of 2000-01 prices from the open market.

ii) IRRI Paddy

7.5 It may be seen from Table-12, that the nominal market price of IRRI paddy in Sindh averaging at Rs 180/- per 40 kgs during the post harvest season of 2000-01 has increased to Rs 875/- per 40 kgs in 2012-13, indicating overall increase of 386 per cent. For the rise in CPI by 185 per cent, the consequent increase in the real market price of IRRI paddy is estimated at 71 per cent from Rs 180/- in base year to Rs 307/- per 40 kgs in 2012-13.

7.6 The data also reveals that during the whole period in question, the real market prices of IRRI paddy remained above the base year level of Rs 180/- per 40 kgs. However, the year 2010-11 was the best crop season for rice growers as they received the highest real price of Rs 383/- per 40 kgs.

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

8.1 World Supply, Demand, Stocks, and Trade Situation

8.1.1 The data regarding the world balance sheet of rice from 2011-12 to 2013-14 are presented in **Table-13**.

8.1.2 The world production of rice in 2012-13 is estimated at 470 million tonnes, 5 million tonnes or 1.08 percent higher than that in 2011-12. Adding the opening stocks of 107 million tonnes, total supply works to 577 million tonnes (2.30 percent) higher than in 2011-12.

8.1.3 Rice production in 2013-14 is forecast to increase to 476 million tonnes, 6 million higher than in 2012-13. With the addition of opening stocks of 107 million tonnes, total supply is excepted at 583 million tonnes, 6 million tonnes higher than in 2012-13. The global consumption is forecast to rise from 469 million tonnes in 2012-13 to 474 million tonnes in 2013-14. Due to higher production against consumption during 2012-13 and 2013-14, the end year stocks has increased to 109 million tonnes. However, the global trade in rice reported at 39 million tonnes in 2011-12 is forecast to slightly decline to 37 million tonnes in 2013-14. Due to persistent increase in stocks and decline in trade over the last year, the prices may slightly fall.

Table -13: World Supply, Demand, Stocks and Trade in Rice: 2011-12 to 2013-14

S.No	Item	2011-12	2012-13 Estimate	2013-14 Forecast
		----------Million tones----------		
1.	Opening stocks	99	107	107
2.	Production	465	470	476
3.	Total supply (Items 1+2)	564	577	583
4.	Consumption/disappearance	458	469	474
5.	Closing stocks	107	170	107
6.	Trade	39	37	37

Source: International Grain Council, Market Report July 01, 2013.

8.2. Export Parity Prices of Rice Paddy

8.2.1 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 is provided in **Table-14**.

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

Items	April 2013	2012-13 (Jul-April)	Average 2009-12
A) Export Parity Price of Basmati Paddy			
- Average fob Karachi prices of rice (US$/ton)	1068	995	978
- Exchange Rate (Rs/US$)	98.52	98.52	98.52
- Average fob Karachi prices of rice (Rs/40Kgs)	4209	3921	3854
- Mill-gate price of rice paddy (Rs/ 40 kgs)	2183	2022	1985
B) Export Parity Price of IRRI Paddy			
- Average fob (Karachi) prices of rice (US$/ton)	450	459	479
- Exchange Rate (Rs/US$)	98.52	98.52	98.52
- Average fob Karachi prices of rice (Rs/40Kgs)	1773	1809	1888
- Mill-gate price of rice paddy (Rs/40 kgs)	769	787	826

9. RICE EXPORT FROM PAKISTAN

9.1 Pakistan has been a major exporter of rice with its share in global trade at 8 per cent during 2011-12. Export of basmati rice has decline by 18.57 per cent in 2011-12 over 2010-11, while the export of coarse rice has also followed the basmati and fallen by 0.33 percent **(Table-15)**.

Table-15: Per Cent Change in Export of Basmati and Coarse Rice in 2011-12 Over 2010-11

Region	Quantity		Value		% share in total export			
	Basmati Rice	Coarse Rice	Basmati Rice	Coarse Rice	Basmati Rice		Coarse Rice	
	----------percent change----------				2010-11	2011-12	2010-11	2011-12
Asia	-15.74	0.23	-28.52	-3.91	77.82	80.52	36.00	36.21
Oceania	-25.04	-18.96	-26.40	-19.20	2.19	2.01	0.09	0.07
Europe	-40.24	-41.21	-44.83	-53.36	13.78	10.12	2.59	1.53
Africa	-12.15	2.96	-17.66	-0.69	3.43	3.70	54.61	56.41
America	-10.39	1.74	0.50	-7.60	2.28	2.51	3.77	3.85
CIS	87.32	-34.35	21.63	-32.32	0.50	1.15	2.94	1.94
Total	-18.57	-0.33	-29.43	-5.14	100.00	100.00	100.00	100.00

Source: Annex- X

9.2 It may seen from Table-15 that total export of basmati rice declined by 18.57 per cent in 2011-12 over 2010-11.The region-wise statistics show that the export of basmati rice in 2011-12 decreased in all regions except CIS countries. The export of basmati rice decreased 15.74 per cent Asia, 25.04 per cent Oceania, 40.24 per cent to Europe, 12.15 per cent to Africa and 10.39 per cent to America, while it increased by 87.32 per cent to CIS countries in 2011-12. The total export of coarse rice has substantially shrunk by 0.33 per cent in 2011-12 against the last year. The export of coarse rice decreased by 18.96 per cent to Oceania, 41.21 percent to Europe and 34.35 percent to CIS countries. While it improved by 0.23 per cent to Asia, 2.96 per cent to Africa and 1.74 per cent to America in 2011-12 over the last year.

10. ECONOMIC EFFICIENCY IN RICE PRODUCTION

10.1 The economic efficiency in rice production has been evaluated by estimating the 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 carried from 2008-09 through 2012-13. 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

10.1.1 NPC is a measure of protection or taxation levied to the producers of a crop through the 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 from the farm gate to the market. The estimate does not include input costs used for producing the crop.

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

10.1.3 It is observed from the data in the Table below that for Basmati grown in Punjab, NPC values are less than one throughout the analysis period i.e 2008-09 to 2012-13. However, their magnitude considerably varied during the reference period. Sometimes these are significantly less than one while during some years these are close to one.

Table-16: Economic Efficiency Coefficients for Rice in Pakistan

Province/ Year	NPC	EPC	DRC	Resources spent to earn Forex worth US $ 1	Dollar Rate US$1 = Pak Rs
Punjab					
Basmati					
2008-09	0.67	0.58	0.31	25.0	80.50
2009-10	0.74	0.65	0.54	45.9	85.00
2010-11	0.91	0.86	0.67	57.5	85.87
2011-12	0.67	0.71	0.59	57.0	96.63
2012-13	0.99	1.25	0.77	75.9	98.52
IRRI					
2008-09	0.99	1.01	0.56	45.1	80.50
2009-10	1.11	1.18	1.00	85.0	85.00
2010-11	1.40	1.70	1.08	92.7	85.87
2011-12	0.76	0.68	0.58	56.0	96.63
2012-13	1.09	1.20	1.50	147.0	98.52
Sindh					
IRRI					
2008-09	0.88	0.85	0.44	35.4	80.50
2009-10	1.11	1.16	0.73	62.1	85.00
2010-11	1.40	1.61	0.81	69.6	85.87
2011-12	0.66	0.59	0.37	35.8	96.63
2012-13	1.18	1.28	0.78	76.8	98.52

Source: Annex-XI to XIII.

10.1.4 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 the vice versa.

10.1.5 The NPC data in the referred Table reflect that Basmati growers in Pakistan are implicitly taxed. This situation discourages development of the crop and domestic price needs to be increased.

10.1.6 For IRRI rice, NPC coefficients are found widely fluctuating both for Punjab and Sindh during the period under study. During 2008-09 and 2011-12 the coefficients are less than one whereas for rest of three years the coefficient values are greater than one. It means that on the whole, IRRI paddy growers are protected through the output price policy which induces for the promotion of the crop.

10.2 Effective Protection Coefficient (EPC) under Export Situation

10.2.1 Effective Protection Coefficient unlike NPC includes both input and output prices in its calculation. Thus it captures the cumulative effect of both inputs costs and the crop revenues on the crop producers. However, it needs to be mentioned that EPC does not consider all input costs rather considers only traded inputs' cost – those inputs which are purchased with cash. These are seed, fertilizer, tube well water, machinery (tractor etc) and payment made to hired labour. 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 the later situation discourages development of the crop.

10.2.2 Review of the EPCs for Basmati paddy produced in **Table-16** indicate that the Basmati growers in Punjab are implicitly taxed because EPCs are found less than one during the period under study except for 2012-13 when value of EPC significantly increased over the previous year. In 2012-13 it increased to the level 1.25 against 0.71 in 2011-12. Its main reason is big jump in domestic price of Basmati paddy in 2013 against the 2011-12 price. In 2011-12 it was Rs 1424/40 Kg while in 2012-13 it increased to Rs. 1968/ 40 Kg.

10.2.3 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 2012-13 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. In absolute terms, export parity price for 2012-13 is Rs. 787/ 40 Kg while domestic market price is Rs. 823/ 40 kg.

10.2.4 For IRRI paddy, values of EPCs are not consistent with the NPCs. For IRRI (Punjab) coefficients for 2008-09 to 2010-11 are higher than one, while in 2011-12 it dropped to 0.68 and improved again in 2012-13 to the level of 1.20 for Punjab and 1.28 for Sindh. It means, on the whole input output pricing policy favors IRRI paddy growers.

10.3 Domestic Resource Cost Coefficient (DRC) under Export Situation

Basmati paddy

10.3.1 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.

10.3.2 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. It means Pakistan has comparative advantage in Basmati production.

IRRI paddy

10.3.3 For IRRI paddy, DRC coefficients for Punjab, most of the time have been higher than one which indicate that IRRI production in Punjab province is not efficient. The referred coefficients support the widely held belief that producing IRRI in Punjab is not a good proposition. However, DRC coefficients for IRRI paddy in Sindh are found less than one during the reference period. DRC values less than one indicate that IRRI paddy is efficiently produced in Sindh province. The finding support that Pakistan has comparative advantage in IRRI rice in the Sindh.

10.4 Cost of earning forex

10.4.1 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**.

10.4.2 It is observed from column 4 in the above **table** that we spend less to earn forex 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

11.1 Global rice during **2011** occupied an area of 164.125 million hectares with a total production of 481.840 million tonnes. The world top 28 producing countries contribute 96 per cent of total area and 97 per cent of total production (Annex-XIV).

11.2 In terms of rice **area,** India is on the top with 44 million hectares followed by China with 30 million and Indonesia with 13 million hectares. Pakistan lies at 12th number in this regard.

10.3 In terms of rice **production**, China is on the top with 135.112 million tonnes followed by India with 103.800 million and Indonesia with 43.827 million tonnes. However, Pakistan lies at 14th position in rice production of the world.

10.4 In terms of **yield** per hectare, Egypt lies at the top with 6378 kgs per hectare followed by Australia with 6363 and Turkey with 6036 kgs per hectare. It is very an alarming situation that **Pakistan** ranks at 85th in terms of yield while **India** falls at 57th position (Annex-XV). It implies that there is a lot of potential to raise rice productivity per hectare in Pakistan.

12. MAJOR RICE VARIETIES AND THEIR YIELD POTENTIAL

12.1 In Pakistan rice is an essential 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 share of rice in the value of export of major agriculture commodities was 8.7 per cent. 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 Producing Provinces of Pakistan

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	
IRRI-6	70	2800	
DR-82	70	2800	80
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), Faisalabad.
ii) Rice Research Institute (RRI), Dokri Sindh.

12.2 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. Based on last three years (2010-11 to 2012-13) the average yield of rice paddy of different varieties for the Punjab

and Sindh, is 1057 **kgs** per acre for Basmati, **1525** kgs for IRRI and **1391 kgs** for **"others;,** in the Punjab. In Sindh, average yield level of IRRI paddy is 2102 kgs per acre and 2218 **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 concrete 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

13.1 Seed is one of the important and basic agricultural inputs as returns from other inputs depend on its quality. To obtain optimum responses of farm inputs and cultural operations, it is necessary to use quality seed of recommended varieties. In the self-pollinated crop like rice, the experts recommend seed should be replaced at least every five years, implying that at least 20 per cent area of rice should be brought under fresh certified seed every year.

13.2 In order to review the overtime progress regarding coverage of quality seed, the annual gross and replacement requirement of certified seed of rice and its availability during the period from 2007-08 to 2012-13 have been presented in **Annex-XVI.**

13.3 It may be seen in Annex-XVI, that the supply of certified seed has shown an irregular trend. During the referenced period, the lowest supply was 12338 tonnes during 2007-08, sufficient to cover 27 per cent area. The supply of certified seed justified to 29811 tonnes in 2009-10, enough to plant 55 per cent of rice. Though the availability of certified seed declined to 26813 tonnes during 2011-12 but covered 54 per cent area due to less area under rice. **However, in terms of area coverage under certified seed, the availability of 44864 tonnes seed during 2012-13 crop year was the highest covering 95 per cent without including imported 2273 tonnes seed during 2012-13 crop.**

13.4 The Varietal breakup of the supply of certified seed of rice both in public and private sector for the crop year **2012-13 is presented in Table-18.**

Table-18: Variety wise Certified Seed of Paddy Supplied by Public and Private Sectors for 2012-13 Crop

Province/Variety	Seed Availability			Area Sown	Seed Requirement	Seed enough for area
	Public Sector	Private Sector	Total			
	--- Tonnes -----			000 hect.	Tonnes	Per cent
Punjab	4046	25460	29506	1818	44864	66
i) Basmati	1594	7894	9488	1465	11941	80
ii) IRRI & others	2452	17567	20018	353	17908	112
Sindh (IRRI + others)	1023	12130	13152	642	12800	103
KPK "others"	0	0	0	60	1278	0
Balochistan "IRRI"	0	0	0	190	938	0
All Pakistan						
i) Basmati	1594	7894	9488	1465	11941	80
ii) IRRI+ others	3474	29696	33170	1245	32923	101
Total	5068	37590	44931	2710	44864	95

Notes: i) Area under "Others variety" of rice has been added in IRRI in the Punjab and Sindh.

ii) The seed requirements have been worked out by using the seed @ 12 kgs per hectare for basmati and 25 kgs for IRRI and others varieties.

iii) Rounding off figures may result in slight differences.

Source: For Seed: FSC & RD. Islamabad.

13.5 Provincial variety-wise data presented in the table above show that in all provinces the major source of supply of certified seed was private sector, accounting **for 88 per cent** on overall basis. The province of Punjab has done better than other provinces in this context. During 2012-13, about 66 per cent of area was covered with certified seed. The Varietal supply position indicates that **101 per cent of IRRI** and other varieties of rice were sown with certified seed while 80 per cent of basmati area was planted with certified seed.

13.6 The area planted with certified seed in Sindh, remained as 103 per cent Khyber Pukhtunkhwa and Balochistan zero per cent in 2012-13. The situation in these provinces is not so encouraging. The Research Institutes need to be strengthened to produce more basic seed to meet the replacement requirement of these provinces.

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ANNEX-I

AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE: 2002-03 TO 2012-13

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 ----------												
2002-03	1316.8	146.5	49.0	1512.3	438.3	50.0	488.3	61.0	163.6	1316.8	748.4	160.0	2225.2
2003-04	1426.1	138.0	123.8	1687.9	495.3	55.9	551.2	61.7	159.8	1426.1	793.1	241.4	2460.6
2004-05	1466.5	108.1	179.7	1754.3	484.9	58.9	543.8	59.9	161.5	1466.5	754.5	298.5	2519.4
2005-06	1534.9	131.9	95.6	1762.4	527.4	65.8	593.2	59.4	206.4	1534.9	865.7	220.8	2621.4
2006-07	1474.2	138.8	115.4	1728.4	534.3	63.8	598.1	60.8	193.9	1474.2	867.0	240.0	2581.2
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	985.1	210.0	506.3	1711.4	331.6	179.5	511.1	48.8	37.5	995.1	579.1	734.6	2308.8
YIELD	---------- kgs per hectare ----------												
2002-03	1652	1977	2337	1706	2830	1184	2662	2159	2857	1652	2669	1909	2013
2003-04	1619	2084	2218	1701	2763	1147	2599	2120	2582	1619	2609	1945	1970
2004-05	1601	2188	2204	1699	2946	1209	2758	2057	2611	1601	2765	1978	1994
2005-06	1721	2387	2333	1804	3109	1239	2901	1978	2563	1721	2869	1911	2116
2006-07	1691	2409	2145	1779	3121	1475	2946	2021	2466	1691	2861	1935	2107
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
PRODUCTI	---------- Thousand tonnes ----------												
2002-03	2175.5	289.7	114.5	2579.7	1240.6	59.2	1299.8	131.7	467.4	2175.5	1997.7	305.4	4478.6
2003-04	2309.2	287.6	274.6	2871.4	1368.7	64.1	1432.8	130.8	412.6	2309.2	2068.9	469.5	4847.6
2004-05	2347.9	236.4	396.0	2980.3	1428.4	71.2	1499.6	123.2	421.6	2347.9	2086.4	590.4	5024.7
2005-06	2641.8	314.8	223.0	3179.6	1639.5	81.5	1721.0	117.5	529.1	2641.8	2483.4	422.0	5547.2
2006-07	2493.6	334.4	247.5	3075.5	1667.7	94.1	1761.8	122.9	478.2	2493.6	2480.3	464.5	5438.4
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

Note:- The varieties of basmati grown in the Kh. Pukhtoonkhowa 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 Kh. Pukhtoonkhowa 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 2002-03 to 2010-11, Agricultural Statistics of Pakistan 2009-10, MINFA Islamabad.
2. For 2011-12 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2012-13 : Final estimates provided by concerned Provincial Agriculture Departments.

ANNEX-I-A

AREA, YIELD AND PRODUCTION OF RICE BY VARIETY AND PROVINCE: 2002-03 TO 2012-13

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 ----------												
2002-03	3253.9	362.0	121.1	3737.0	1083.1	123.6	1206.6	150.7	404.3	3253.9	1849.4	395.4	5498.7
2003-04	3524.0	341.0	305.9	4170.9	1223.9	138.1	1362.1	152.5	394.9	3524.0	1959.8	596.5	6080.4
2004-05	3623.9	267.0	444.0	4335.1	1198.2	145.5	1343.8	148.0	399.1	3623.9	1864.3	737.6	6225.8
2005-06	3792.9	325.9	236.2	4355.1	1303.3	162.6	1465.9	146.8	510.0	3792.9	2139.2	545.6	6477.7
2006-07	3642.9	343.0	285.2	4271.0	1320.3	157.7	1478.0	150.2	479.1	3642.9	2142.4	593.1	6378.4
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
YIELD	---------- kgs per acre ----------												
2002-03	669	800	946	690	1145	479	1077	874	1156	669	1080	772	814
2003-04	655	843	898	688	1118	464	1052	858	1045	655	1056	787	797
2004-05	648	885	892	687	1192	489	1116	832	1056	648	1119	800	807
2005-06	697	966	944	730	1258	501	1174	800	1037	697	1161	773	856
2006-07	685	975	868	720	1263	597	1192	818	998	685	1158	783	853
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
PRODUCTI	---------- Thousand tonnes ----------												
2002-03	2175.5	289.7	114.5	2579.7	1240.6	59.2	1299.8	131.7	467.4	2175.5	1997.7	305.4	4478.6
2003-04	2309.2	287.6	274.6	2871.4	1368.7	64.1	1432.8	130.8	412.6	2309.2	2068.9	469.5	4847.6
2004-05	2347.9	236.4	396.0	2980.3	1428.4	71.2	1499.6	123.2	421.6	2347.9	2086.4	590.4	5024.7
2005-06	2641.8	314.8	223.0	3179.6	1639.5	81.5	1721.0	117.5	529.1	2641.8	2483.4	422.0	5547.2
2006-07	2493.6	334.4	247.5	3075.5	1667.7	94.1	1761.8	122.9	478.2	2493.6	2480.3	464.5	5438.4
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

Note:- The varieties of basmati grown in the Kh. Pukhtoonkhowa 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 Kh. Pukhtoonkhowa 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 2002-03 to 2010-11, Agricultural Statistics of Pakistan 2009-10, MINFA Islamabad.
2. For 2011-12 : Final estimates provided by concerned Provincial Agriculture Departments.
3. For 2012-13 : Final estimates provided by concerned Provincial Agriculture Departments.

Annex-II

DISTRICT-WASE PRODUCTION OF RICE BY VARIETY: AVERAGE OF 2010-11 TO 2012-13

"000"tonnes

S.No	Province/ District	Basmati	IRRI	Others	Total	Percent	S.No	Province/ District	Basmati	IRRI	Others	Total	Percent
	Punjab							Khyber Pukhtoonkhowa					
1	Gujranwala	171.5	0.0	372.2	543.7	9.9	1	Swat	-	-	14.6	14.6	0.3
2	Sheikhupur	254.8	0.0	107.9	362.7	6.6	2	D.I.Khan	-	-	12.9	12.9	0.2
3	Sialkot	234.7	0.0	67.0	301.7	5.5	3	Kurram AG	-	-	8.2	8.2	0.1
4	Okara	73.2	189.2	19.7	282.1	5.1	4	Malakand	-	-	7.7	7.7	0.1
5	Hafizabad	130.9	0.0	131.2	262.1	4.8	5	Dir Upper	-	-	7.6	7.6	0.1
6	Nankana S	106.6	0.0	71.4	178.0	3.2	6	Bajour AG.	-	-	6.8	6.8	0.1
7	Kasur	73.7	58.3	19.3	151.2	2.7	7	Dir Lower	-	-	5.2	5.2	0.1
8	Narowal	143.5	0.0	7.5	151.0	2.7	8	Mansehra	-	-	4.6	4.6	0.1
9	M.B.Din	128.0	0.0	20.2	148.2	2.7	9	Chitral	-	-	3.8	3.8	0.1
10	Bahawalna	66.6	23.9	18.8	109.3	2.0	10	Battagram	-	-	3.6	3.6	0.1
11	Pakpattan	45.7	61.6	0.3	107.6	2.0	11	Bannu	-	-	3.5	3.5	0.1
12	Jhang	93.0	0.3	2.7	96.0	1.7	12	Mardan	-	-	3.5	3.5	0.1
13	Sargodha	60.4	0.4	3.5	64.3	1.2	13	Shangla	-	-	3.4	3.4	0.1
14	D.G.Khan	0.0	61.4	0.0	61.4	1.1	14	Swabi	-	-	0.7	0.7	0.0
15	Gujrat	54.7	0.0	6.1	60.8	1.1	15	Peshawar	-	-	0.6	0.6	0.0
16	Chiniot	40.0	17.2	1.5	58.7	1.1	16	Bunir	-	-	0.5	0.5	0.0
17	Lahore	33.7	4.6	19.8	58.2	1.1	17	Hangu	-	-	0.5	0.5	0.0
18	T.T.Singh	54.4	0.0	2.4	56.9	1.0	18	Kohat	-	-	0.3	0.3	0.0
19	Faisalabad	30.3	1.0	16.5	47.8	0.9	19	Charsadda	-	-	0.3	0.3	0.0
20	Sahiwal	41.6	5.4	0.0	46.9	0.9	20	Nowshera	-	-	0.2	0.2	0.0
21	Vehari	36.4	2.2	0.3	38.9	0.7	21	Orakzai AG	-	-	0.2	0.2	0.0
22	Khanewal	38.2	0.3	0.3	38.9	0.7	22	Kohistan	-	-	0.1	0.1	0.0
23	Muzaffarg	6.3	30.4	1.4	38.0	0.7	23	N.Waziristı	-	-	0.1	0.1	0.0
24	R.Y.Khan	14.2	18.1	0.0	32.2	0.6	24	Tank	-	-	0.1	0.1	0.0
25	Khushab	26.6	0.0	0.6	27.2	0.5	25	F.R.D.I.Kha	-	-	0.1	0.1	0.0
26	Multan	12.5	2.6	1.7	16.8	0.3							
27	Lodhran	9.8	0.0	0.0	9.8	0.2							
28	Layyah	8.4	0.0	0.0	8.4	0.2							
29	Bahawalpu	6.0	1.6	0.0	7.6	0.1							
30	Mianwali	5.1	0.0	0.0	5.1	0.1							
31	Rajanpur	0.0	5.0	0.0	5.0	0.1							
32	Jhelum	2.0	0.0	0.0	2.0	0.0							
33	Bhakkar	1.4	0.0	0.0	1.4	0.0							
	Sub Total	2004.1	483.3	892.3	3379.7	61.4		Sub Total	0.0	0.0	89.0	89.0	1.6
	Sindh							Balochistan					
1	Larkana	-	297.8	62.0	359.7	6.5	1	Jaffarabad	-	140.6	-	140.6	2.6
2	Shikarpur	-	173.3	91.5	264.8	4.8	2	Nasirabad		116.9	-	116.9	2.1
3	Qambar	-	171.9	50.9	222.8	4.0	3	Khuzdar	-	1.9	-	1.9	0.0
4	Badin	-	91.1	111.8	202.9	3.7	4	Awaran	-	0.2	-	0.2	0.0
5	Thatta	-	113.9	52.7	166.6	3.0	5	Lasbella	-	0.1	-	0.1	0.0
6	Kashmore	-	86.0	63.3	149.4	2.7	6	Jhal Magsi	-	0.1	-	0.1	0.0
7	Jacobabad	-	54.0	74.7	128.7	2.3							
8	Dadu	-	71.8	31.2	103.1	1.9							
9	T.M.Khan	-	19.8	23.8	43.7	0.8							
10	Ghotki	-	23.4	17.6	41.0	0.7							
11	Khairpur	-	23.2	2.2	25.3	0.5							
12	N.Feroze	-	13.9	4.1	18.0	0.3							
13	Sukkur	-	6.9	8.2	15.1	0.3							
14	Nawabshal	-	11.4	2.3	13.7	0.2							
15	Sanghar	-	6.2	5.3	11.6	0.2							
16	Mirpurkha	-	2.5	1.8	4.3	0.1							
17	Hyderabad	-	2.1	2.0	4.1	0.1							
18	Matiari	-	2.2	0.0	2.3	0.0							
19	Tando Allal	-	0.8	0.1	0.9	0.0							
20	Jamshoro	-	0.1	0.1	0.3	0.0							
	Sindh Tota	-	1172.5	605.6	1778.1	32.3		ochistan Total	-	259.8	-	259.8	4.7
								Pakistan Total	2004.1	1916.6	1586.8	5508.5	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: 2007-08 to 2011-12 (October - September)

S.No	Items	2007-08	2008-09	2009-10	2010-11	2011-12
		----------Thousands tonnes----------				
	Production	5563	6952	6883	5386	6160
2	Deduction for seed, feed and wastage @ 6 percent for production	334	417	413	323	370
3	Export	2809	2729	3733	3670	3002
4	Net availability	2420	3806	2737	1393	2788
		----------Millions----------				
5	Population as on firstJanuary (a) i.e mid year rice	172.91	176.53	180.19	183.87	187.58
		----------Kgs----------				
6	Per capita availability (consumption)	14.00	21.56	15.19	7.58	14.87
7	Average per capita availability					
	Average (2007-08 to 2011-12)		14.68			
	Average (2009-10 to 2011-12)		15.03			

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

Sources:

1 For Imports and Exports: Federal Bureau of Statistics, Karachi.
2 For Population of Pakistan: Economic Survey, 2009-10.
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 FARMERS' COST OF PRODUCTION OF BASMATI PADDY IN THE PUNJAB: 2012-13 AND 2013-14 CROPS

Sr. No.	Operations/inputs	Average No./oprs/ units/acre	2012 -13 crop		2013 - 14 crop		Change in 2013-14 over 2012-13
			Rate per unit	Cost per acre	Rate per unit	Cost per acre	
1	2	3	4	5=3*4	6	7=3*6	8=7-5
				----Rupees-----			
1.	Land preparation:						
	1.1 dry ploughing	4.000	600.00	2400.00	650.00	2600.00	200.00
	1.2 wet ploughing	2.000	775.00	1550.00	850.00	1700.00	150.00
	1.3 wet planking	2.000	400.00	800.00	425.00	850.00	50.00
2.	Nursery used (marlas)	3.390	-	1150.00	-	1285.00	135.00
3.	Uprooting, transporting and transplanting (contract)	-	-	2000.00	-	2200.00	200.00
4.	Labour for bund making etc. (m.day)	0.984	300.00	295.20	350.00	344.40	49.20
5.	Weeding:						
	5.1 manual (m.day)	1.154	300.00	346.20	350.00	403.90	57.70
	5.2 weedicides (No)	0.367	500.00	183.50	550.00	201.85	18.35
6.	Plant protection including application	0.786	600.00	471.60	650.00	510.90	39.30
7.	Farm yard manure including transport and application (50%)	0.200	2250.00	225.00	2250.00	225.00	0.00
8.	Fertilizer (bags)						
	8.1 DAP	0.585	3942.00	2306.07	3913.00	2289.11	-16.96
	8.2 NP	0.195	2492.00	485.94	2683.00	523.19	37.25
	8.3 Urea	1.146	1771.00	2029.57	1721.00	1972.27	-57.30
	8.4 Zinc Sulphate	0.316	600.00	189.60	600.00	189.60	0.00
9.	Fertilizer transport and application	2.270	45.00	102.15	50.00	113.50	11.35
10.	Irrigation * (Nos)						
	10.1 Canal	10.776	-	85.00	-	85.00	0.00
	10.2 Private tubewell	8.321	1000.00	8321.00	1025.00	8529.03	208.03
11.	Labour used for irrigation and water course cleaning (man days)	6.116	300.00	1834.69	350.00	2140.47	305.78
12.	Mark up on investment @ 12.0 % per annum for 6 months on item 1 to 11 minus item 10.1	-	-	1481.43	-	1564.69	83.26
13.	Harvesting, threshing and winnowing (kgs/acre)	89.280	34.73	3100.69	48.00	4285.44	1184.75
14.	Management charges for 6 months	-	-	850.00	-	1030.00	180.00
15.	Land rent for 6 months (Rs/acre/annum)	-	18000.00	9000.00	19000.00	9500.00	500.00
16.	Land revenue, local rate, pachotra etc.	-	-	5.00	-	5.00	0.00
17.	Average land tax @ Rs 132/acre/annum for 6 months	-	132.00	66.00	132.00	66.00	0.00
18.	Gross cost (item 1 to 17)	-	-	39278.64	-	42614.33	3335.69
19.	Value of straw	-	-	5000.00	-	6000.00	1000.00
20.	Net cost of cultivation (item 18-19)						
	20.1 with land rent	-	-	34278.64	-	36614.33	2335.69
	20.2 without land rent	-	-	25278.64	-	27114.33	1835.69
21.	Yield per acre (kgs)	-	-	1053.00	-	1053.00	0.00
22.	Cost of production at farm (Rs/40 kgs)						
	22.1 with land rent	-	-	1302.13	-	1390.86	88.73
	22.2 without land rent	-	-	960.25	-	1029.98	69.73
23.	Marketing charges i.e. Loading, transport, commission, weighment (Rs/40 kgs)	-	-	35.00	-	40.00	5.00
24.	Cost of production at market level (Rs/40 kgs)						
	24.1 with land rent	-	-	1337.13	-	1430.86	93.73
	24.2 without land rent	-	-	995.25	-	1069.98	74.73

* hrs/irrigation: Canal 1.96, Private tube-well = 2.38

Annex-V

AVERAGE FARMERS' COST OF PRODUCTION OF IRRI PADDY IN THE PUNJAB: 2012-13 AND 2013-14 CROPS

Sr. No.	Operations/inputs	Average No./oprs/ units/acre	2012 -13 crop		2013 - 14 crop		Change in 2013-14 over 2012-13
			Rate per unit	Cost per acre	Rate per unit	Cost per acre	
1	2	3	4	5=3*4	6	7=3*6	8=7-5
				----Rupees-------			
1.	Land preparation:						
	1.1 dry ploughing	4.000	600.00	2400.00	650.00	2600.00	200.00
	1.2 wet ploughing	2.000	775.00	1550.00	850.00	1700.00	150.00
	1.3 wet planking	1.000	400.00	400.00	425.00	425.00	25.00
2.	Nursery used (marlas)	3.494	-	1100.00	-	1125.00	25.00
3.	Uprooting, transporting and transplanting (contract)	-	-	2000.00	-	2200.00	200.00
4.	Labour for bund making etc. (man day)	1.150	300.00	345.00	350.00	402.50	57.50
5.	Weeding:						
	5.1 manual (m.day)	1.338	300.00	401.40	350.00	468.30	66.90
	5.2 weedicides (No)	0.655	500.00	327.50	550.00	360.25	32.75
6.	Plant protection including application	0.812	600.00	487.20	650.00	527.80	40.60
7.	Farm yard manure including transport and application (50%)	0.196	2150.00	210.70	2150.00	210.70	0.00
8.	Fertilizer (bags)						
	8.1 DAP	0.702	3942.00	2767.28	3913.00	2746.93	-20.36
	8.2 NP	0.303	2492.00	755.08	2683.00	812.95	57.87
	8.3 Urea	1.498	1771.00	2652.96	1721.00	2578.06	-74.90
	8.4 Zinc Sulphate	0.818	600.00	490.80	600.00	490.80	0.00
9.	Fertilizer transport and application	3.337	45.00	150.17	50.00	166.85	16.69
10.	Irrigation * (Nos)						
	10.1 Canal	15.905	-	85.00	-	85.00	0.00
	10.2 Private tubewell	4.493	950.00	4268.35	975.00	4380.68	112.33
11.	Labour used for irrigation and water course cleaning (man days)	5.964	300.00	1789.20	350.00	2087.40	298.20
12.	Mark up on investment @ 12.0 % per annum for 6 months on item 1 to 11 minus item 10.1	-	-	1325.74	-	1396.99	71.25
13.	Harvesting, threshing and winnowing (kgs/acre)	134.100	22.08	2960.93	19.58	2625.68	-335.25
14.	Management charges for 6 months	-	-	850.00	-	1030.00	180.00
15.	Land rent for 6 months (Rs/acre/annum)	-	18000.00	9000.00	19000.00	9500.00	500.00
16.	Land revenue, local rate, pachotra etc.	-	-	5.00	-	5.00	0.00
17.	Average land tax @ Rs 132/acre/annum for 6 months	-	132.00	66.00	132.00	66.00	0.00
18.	Gross cost (item 1 to 17)	-	-	36388.30	-	37991.88	1603.58
19.	Value of straw	-	-	3000.00	-	3500.00	500.00
20.	Net cost of cultivation (item 18-19)						
	20.1 with land rent	-	-	33388.30	-	34491.88	1103.58
	20.2 without land rent	-	-	24388.30	-	24991.88	603.58
21.	Yield per acre (kgs)	-	-	1510.00	-	1510.00	0.00
22.	Cost of production at farm (Rs/40 kgs)						
	22.1 with land rent	-	-	884.46	-	913.69	29.23
	22.2 without land rent	-	-	646.05	-	662.04	15.99
23.	Marketing charges i.e. Loading, transport, commission, weighment (Rs/40 kgs)	-	-	35.00	-	40.00	5.00
24.	Cost of production at market level (Rs/40 kgs)						
	24.1 with land rent	-	-	919.46	-	953.69	34.23
	24.2 without land rent	-	-	681.05	-	702.04	20.99

* hrs/irrigation: Canal = 1.96, Private tube-well = 2.22

Annex-VI

AVERAGE FARMERS' COST OF PRODUCTION OF IRRI PADDY IN SINDH: 2012-13 AND 2013-14 CROPS

Sr. No.	Operations/inputs	Average No./oprs/ units/acre	2012 -13 crop		2013 - 14 crop		Change in 2013-14 over 2012-13
			Rate per unit	Cost per acre	Rate per unit	Cost per acre	
1	2	3	4	5=3*4	6	7=3*6	8=7-5
				---------Rupees---------			
1.	Land preparation:						
	1.1 dry ploughing	5.000	900.00	4500.00	975.00	4875.00	375.00
	1.2 dry planking	1.000	450.00	450.00	500.00	500.00	50.00
	1.3 levelling (tractor hour)	1.000	900.00	900.00	975.00	975.00	75.00
2.	Nursery (ghunta)	1.000	-	1650.00	-	1765.00	115.00
3.	Uprooting, transporting and transplanting (contract)	-	-	2250.00	-	2475.00	225.00
4.	Labour for bund making etc. (man day)	2.000	300.00	600.00	350.00	700.00	100.00
5.	Manual weeding (m.day)	2.435	300.00	730.50	350.00	852.25	121.75
6.	Plant protection						
	6.1 granular pesticides	0.733	500.00	366.50	550.00	403.15	36.65
	6.2 formulated spray	0.076	600.00	45.60	650.00	49.40	3.80
7.	Farm yard manure including transport and application (50%)	0.028	2150.00	30.10	2150.00	30.10	0.00
8.	Fertilizer (bags)						
	8.1 DAP	0.947	3817.00	3614.70	3800.00	3598.60	-16.10
	8.2 Urea	1.384	1780.00	2463.52	1758.00	2433.07	-30.45
	8.3 Zinc sulphate	0.051	600.00	30.60	600.00	30.60	0.00
9.	Fertilizer transport and application	2.384	45.00	107.28	50.00	119.20	11.92
10.	Irrigation * (Nos)						
	10.1 canal	17.939	-	88.78	-	88.78	0.00
	10.2 private tubewell	0.522	615.00	321.03	650.00	339.30	18.27
11.	Labour used for irrigation and water course cleaning (man days)	5.595	300.00	1678.40	350.00	1958.14	279.73
12.	Mark up on investment @ 12.0 % per annum for 6 months on item 1 to 11 minus item 10.1	-	-	1184.29	-	1266.23	81.93
13.	Harvesting and threshing etc. (kgs/acre)	185.250	19.08	3534.57	21.25	3936.56	401.99
14.	Management charges for 6 months	-	-	850.00	-	1030.00	180.00
15.	Land rent for 6 months (Rs/acre/annum)	-	15000.00	7500.00	16000.00	8000.00	500.00
16.	Land revenue, local rate, pachotra etc.	-	-	5.00	-	5.00	0.00
17.	Land tax @ Rs 200/acre/annum for 6 months	-	200.00	100.00	200.00	100.00	0.00
18.	Drainage cess @ Rs 24/acre/annum for 6 months	-	24.00	12.00	24.00	12.00	0.00
19.	Gross cost (item 1 to 18)	-	-	33012.88	-	35542.38	2529.50
20.	Value of straw	-	-	3000.00	-	3500.00	500.00
21.	Net cost of cultivation (item 19-20)						
	21.1 with land rent	-	-	30012.88	-	32042.38	2029.50
	21.2 without land rent	-	-	22512.88	-	24042.38	1529.50
22.	Yield per acre (kgs)	-	-	2004.00	-	2004.00	0.00
23.	Cost of production at farm (Rs/40 kgs)						
	23.1 with land rent	-	-	599.06	-	639.57	40.51
	23.2 without land rent	-	-	449.36	-	479.89	30.53
24.	Marketing charges i.e. Loading, transport, commission, weighment (Rs/40 kgs)	-	-	35.00	-	40.00	5.00
25.	Cost of production at market level (Rs/40 kgs)						
	25.1 with land rent	-	-	634.06	-	679.57	45.51
	25.2 without land rent	-	-	484.36	-	519.89	35.53

* hrs/irrigation: Canal = 1.56, Private tube-well = 1.48

Notes for Annex-IV to VI.

1. The input-output parameters for estimating cost of production for Rice Paddy, 2013-14 crop were adopted from the Price Policy Report of Rice Paddy, 2012-13 Crop, API Series No 242.

2. The farm inputs prices, hiring rates of field operations, wage rate, land rentals, value of straw and marketing cost have been revised in the light of the information provided by the Provincial Agriculture Departments, Farmers' Associations and Kissan/Abadgar Boards in the meeting of the API's Standing Committee on Rice, held on 12th June 2013 at PARC' s Auditorium, Islamabad and other sources as:

3. The prices of chemical fertilizers have been revised in light of the fertilizers prices published by the Federal Bureau of Statistics, Islamabad for the week ending on 20th June 2013.

4. The cost of supplementary irrigation has been revised in view of changes in the prices of diesel from Rs 105.77 in June 2012 to Rs 104.60/lt in June 2013 and power tariff from Rs 5.31 to 6.77/kwh, based on the ratios of electric and diesel tube-wells of 13:87 in the Punjab, 23:77 in Sindh as reported in the Agriculture Statistics of Pakistan, 2010-11, Pakistan Bureau of Statistics Islamabad.

5. The management charges for a manager looking after a 25-acre farm and devoting one-fourth of his time to the managerial activities have been worked out at Rs 17189 per month for a Field Assistant at the 15th stages in BPS-6 as per revised scale of July 2011, including 15 & 10 % Ad hoc Relief in 2012 and 2013 respectively.

6. The kind payments were valued at the post-harvest markets prices of paddy prevailed during 2012-13 @ Rs 1968 per 40 kgs for basmati, Rs 823 for IRRI in the Punjab and Rs 899 for IRRI in Sindh. The marketing cost of Rs 40 per 40 kgs has been deducted from the market prices to bring at the farm level.

7. The land rent is the major component in cost of production in both provinces in the Punjab and Sindh. In general it varies from region to region and affects by several factors. To revise land rent, there is no precise measure to bring up to date it. However, keeping in view the information collected during an annual field survey conducted by the API during May 2013 in Sindh and discussion made by the representatives of the rice paddy farmers in the meetings as mentioned above, land rents have been adjusted accordingly.

Annex-VII

ECONOMICS OF RICE PADDY AND COMPETING CROPS AT PRICES REALIZED BY THE GROWERS: 2012-13 CROPS

S #	Province/crops/crop combination	Crop duration	Water used	Gross cost	Cost of purchased inputs	Gross revenue	Gross margin	Net income	Output-input ratio	Revenue per		
										Rupee of purchased inputs	Crop day	Acre inch of water used
		Days	Acre inches	.....Rupees per acre.....					Ratio	.....Rupees.....		
	1	2	3	4	5	6	7=6-5	8=6-4	9=6/4	10=6/5	11=6/2	12=6/3
	Punjab											
1	Basmati paddy	180	58	39279	19159	41565	22406	2287	1.06	2.17	231	717
2	IRRI paddy	180	62	36388	16874	36333	19460	-55	1.00	2.15	202	586
3	Seed cotton	240	22	46506	16928	47868	30940	1362	1.03	2.83	199	2176
4	Wheat	180	12	31898	13200	37240	24040	5342	1.17	2.82	207	3103
5	Sunflower (spring)	180	22	36204	15361	43400	28040	7196	1.20	2.83	241	1973
6	Seed cotton + wheat	420	34	78404	30128	85108	54980	6704	1.09	2.82	203	2503
7	Seed cotton + sunflower	420	44	82710	32288	91268	58980	8558	1.10	2.83	217	2074
8	Basmati paddy+wheat	360	70	71177	32360	78805	46446	7629	1.11	2.44	219	1126
9	Basmati paddy+sunflower	360	80	75483	34520	84965	50446	9483	1.13	2.46	236	1062
10	IRRI paddy + wheat	360	74	68286	30074	73573	43499	5287	1.08	2.45	204	994
11	IRRI paddy+sunflower	360	84	72592	32234	79733	47499	7141	1.10	2.47	221	949
12	Sugarcane	394	48	71821	23063	88587	65524	16766	1.23	3.84	225	1846
	Sindh											
1	IRRI paddy	180	56	33013	12616	41226	28610	8213	1.25	3.27	229	736
2	Seed cotton	240	18	42561	14686	48840	34154	6279	1.15	3.33	204	2713
3	Wheat	180	12	28569	11788	33034	21247	4466	1.16	2.80	184	2753
4	Sunflower (spring)	180	22	36191	15364	43400	28037	7209	1.20	2.82	241	1973
5	Seed cotton + wheat	420	30	71130	26473	81874	55401	10744	1.15	3.09	195	2729
6	Seed cotton + sunflower	420	40	78753	26473	92240	65767	13488	1.17	3.48	220	2306
7	IRRI paddy+ wheat	360	68	61582	24404	74261	49856	12679	1.21	3.04	206	1092
8	IRRI paddy+sunflower	360	78	69204	27980	84626	56646	15422	1.22	3.02	235	1085
9	Sugarcane	488	71	84932	28582	108523	80041	23691	1.28	3.80	223	1530

Notes for Annex –VII

1. The economic analysis presented in the above exercise is based on the input-output prices applicable for 2012-13 crops.

2. The data regarding input-output parameters have been adopted from the API's Crop Policy Analysis Reports for sugarcane, seed cotton, rice paddy and wheat, 2012-13 crops. However, the relevant data for sunflower and canola were adopted from the last support price policy for non-traditional oilseeds, 2000-01 crops with necessary adjustments in input prices for updating costs and incomes for the 2012-13 crops. To incorporate the escalations in input prices, which occurred during the growing period of 2012-13 crops, some marginal revisions have been made as under:

   2.1 The cost of supplementary irrigation has been adjusted in accordance with the variation in the electric charges; @ 22 % for sugarcane, seed cotton, & rice paddy and 8.23% for wheat. Similarly, diesel rates have also been adjusted @ 34% for sugarcane, 7% for seed cotton, 17.85 % for rice paddy and 11 % for wheat crop.

   2.2 The cost of fertilizers has been revised in view of their prices prevailed at the time of application for the respective crops in 2012-13 season.

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

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

   4.1 The support price of Rs. 1200 per 40 kgs as announced by the Government for 2012-13 wheat crop has been used for current analysis.

   4.2 The wholesale market prices of basmati paddy and IRRI paddy during the post harvest period of 2012-13 in major producer area markets have averaged at Rs 1424 and Rs 918 per 40 kgs for Punjab. The market prices of IRRI paddy averaged at Rs. 798 per 40 kgs for Sindh..

   4.3 The wholesale market prices of seed cotton during the post-harvest period of 2012-13 in the main producer area markets of Punjab have averaged at Rs 2552 per 40 kgs. In Sindh, the corresponding prices averaged at Rs 2543 per 40 kgs.

   4.4 The average market price of Rs. 2200 per 40 kgs for sunflower 2012-13 crop as reported by PODB is used for current analysis.

   4.5 The market prices of sugarcane at mill-gate for 2012 – 13 crop in the major cane producing areas are reported to hover around Rs 170 per 40 kgs in the Punjab and Rs 174 in Sindh.

5. The market prices have been adjusted for the marketing expenses to make them effective at the farm level. These expenses amount to Rs 13.25 per 40 kgs in Punjab and Rs 13.32 in Sindh for sugarcane, Rs 35 for seed cotton in Punjab and Sindh, Rs 35 for rice paddy, and Rs 25 for wheat and oilseeds.

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

Annex-VIII

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

S.No	Item	April, 13	2012-13 (Jul-April)	2009-12
1.	Average fob (Karachi) prices of rice		-------- Per Tonne --------	
	US$ per tonne	1068	995	978
	Current exchange rate (Rs per US$)	98.52	98.52	98.52
	Pak Rupees per tonne	105219	98027	96353
			------- Rs per 40 kgs ------	
2.	Expenses from sheller/ market to export point	4209	3921	3854
		225	225	225
3.	Producer area market level price of rice (item 1-item 2)	3984	3696	3629
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	3984	3696	3629
	ii) Short grain rice (70% of export quality -item 3)	2789	2587	2540
	iii) Brokens (50% of short grainrice)	1992	1848	1815
	iv) Tips (30% of short grainrice)	1195	1109	1089
	v) Bran powder (15% of short grainrice)	598	554	544
	vi) Husk	150	150	150
6.	Value of products recoverable from 100 kgs paddy			
	i) Export quality rice	3486	3234	3175
	ii) Short grain rice	871	809	794
	iii) Brokens	996	924	907
	iv) Tips	105	97	95
	v) Bran powder	90	83	82
	vi) Husk	86	86	86
	vii) **Total value of all products**	**5634**	**5233**	**5140**
7.	Husking/Processing /financial charges of			
	i) 100 kgs paddy	127	127	127
	ii) Export quality rice @Rs1 per Kg	50	50	50
8.	Mill-gate price of paddy per 100 kgs	5457	5056	4963
9.	Mill-gate price of paddy per 40 kgs	2183	2022	1985

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	April, 13	2012-13 (Jul-April)	2009-12
		--------- Per Tonne --------		
1.	Average fob (Karachi) prices of rice			
	US$ per tonne	450	459	479
	Current exchange rate (Rs per US$)	98.52	98.52	98.52
	Pak Rupees per tonne	44334	45221	47191
		------- Rs per 40 kgs ------		
	520	1773	1809	1888
2.	Expenses from sheller/ market to export point	125	125	125
3.	Producer area market level price of rice (item 1-item 2)	1648	1684	1763
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	1648	1684	1763
	ii) Short grain rice (70% of export quality -item 3)	1154	1179	1234
	iii) Brokens (50% of short grainrice)	577	589	617
	iv) Tips (30% of short grainrice)	346	354	370
	v) Bran powder (15% of short grainrice)	173	177	185
	vi) Husk	100	100	100
6.	Value of products recoverable from 100 kgs paddy			
	i) Export quality rice	1385	1414	1481
	ii) Short grain rice	358	365	382
	iii) Brokens	202	206	216
	iv) Tips	61	62	65
	v) Bran powder	30	31	32
	vi) Husk	65	65	65
	vi) **Total value of all products**	**2100**	**2144**	**2241**
7	Husking/Processing /financial charges of			
	i) 100 kgs paddy	127	127	127
	ii) Export quality rice @Rs1 per Kg	50	50	50
8.	Mill-gate price of paddy per 100 kgs	1923	1967	2064
9.	Mill-gate price of paddy per 40 kgs	769	787	826

Sources:

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

Annex- X

REGION WISE EXPORT OF BASMATI AND COARSE RICE DURING : 2010-11 AND 2011-12

Region	Quantity			Value			% share in in total export	
	2010-11	2011-12	% Change	2010-11	2011-12	% Change	2010-11	2011-12
	....000 tonnes.....			...Million US $...			Per cent	
A. Basmati Rice								
Asia	910.96	767.53	-15.74	910.96	651.19	-28.52	77.82	80.52
Oceania	25.58	19.18	-25.04	25.58	18.83	-26.40	2.19	2.01
Europe	161.36	96.42	-40.24	161.36	89.02	-44.83	13.78	10.12
Africa	40.16	35.28	-12.15	40.16	33.07	-17.66	3.43	3.70
America	26.70	23.93	-10.39	26.70	26.83	0.50	2.28	2.51
CIS	5.83	10.92	87.32	5.83	7.09	21.63	0.50	1.15
Total	**1170.59**	**953.25**	**-18.57**	**1170.59**	**826.03**	**-29.43**	**100.00**	**100.00**
B. Coarse Rice								
Asia	739.92	741.64	0.23	394.22	378.79	-3.91	36.00	36.21
Oceania	1.83	1.48	-18.96	1.31	1.06	-19.20	0.09	0.07
Europe	53.18	31.26	-41.21	37.98	17.72	-53.36	2.59	1.53
Africa	1122.28	1155.45	2.96	509.45	505.91	-0.69	54.61	56.41
America	77.42	78.77	1.74	33.94	31.36	-7.60	3.77	3.85
CIS	60.49	39.71	-34.35	29.79	20.17	-32.32	2.94	1.94
Total	**2055.12**	**2048.31**	**-0.33**	**1006.70**	**955.00**	**-5.14**	**100.00**	**100.00**

Source: FBS, Karachi

ANNEX-XI

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

POLICY ANALYSIS MATRIC (PAM)

Based on export parity prices

Description	Revenues	Traded cost	Domestic factors' cost	Profits
	--------- Rupees per acre ---------			
2008-09				
Private Prices	27214	9236	9187	8791
Social Prices	40037	9289	9452	21296
Transfers	-12823	-53	-266	-12505
2009-10				
Private Prices	25991	9348	13414	3229
Social Prices	34749	9289	13682	11779
Transfers	-8759	60	-268	-8550
2010-11				
Private Prices	31269	12252	14454	4563
Social Prices	34290	12161	14760	7370
Transfers	-3021	91	-306	-2806
2011-12				
Private Prices	39287	15591	19208	4489
Social Prices	48916	15561	19562	13793
Transfers	-9630	29	-354	-9305
2012-13				
Private Prices	53608	17615	21718	14275
Social Prices	46281	17579	22097	6606
Transfers	7326	36	-379	7669

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 --------		
2008-09				
Private Prices	22930	8458	7543	6928
Social Prices	23064	8694	8101	6268
Transfers	-134	-236	-558	660
2009-10				
Private Prices	23328	7949	12392	2986
Social Prices	21081	8067	12959	55
Transfers	2246	-118	-567	2931
2010-11				
Private Prices	32445	10383	13346	8716
Social Prices	23531	10531	14001	-1001
Transfers	8914	-148	-655	9717
2011-12				
Private Prices	36084	13558	18476	4050
Social Prices	46990	13843	19246	13901
Transfers	-10906	-285	-769	-9851
2012-13				
Private Prices	32474	15382	20608	-3517
Social Prices	29966	15700	21438	-7172
Transfers	2508	-318	-830	3656

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 ---------		
2008-09				
Private Prices	22474	6926	7910	7638
Social Prices	25401	7201	8094	10106
Transfers	-2927	-274	-184	-2468
2009-10				
Private Prices	25675	6825	11601	7250
Social Prices	23193	7008	11785	4400
Transfers	2482	-183	-184	2850
2010-11				
Private Prices	35694	9090	13281	13323
Social Prices	25875	9302	13500	3073
Transfers	9818	-213	-219	10250
2011-12				
Private Prices	41480	12098	18077	11304
Social Prices	61871	12451	18347	31072
Transfers	-20391	-353	-270	-19768
2012-13				
Private Prices	46089	13549	19552	12988
Social Prices	39426	13923	19842	5661
Transfers	6663	-374	-290	7327

Annex-XIV

AREA AND PRODUCTION OF MAJOR RICE PRODUCING COUNTRIES IN THE WORLD : 2011 CROP

S.No.	Country	Area million(ha)	Per cent share
1	India	44.100	26.87
2	China	30.311	18.47
3	Indonesia	13.201	8.04
4	Bangladesh	12.000	7.31
5	Thailand	11.630	7.09
6	Myanmar	8.038	4.90
7	Viet Nam	7.652	4.66
8	Philippines	4.537	2.76
9	Cambodia	2.926	1.78
10	Brazil	2.753	1.68
11	Nigeria	2.580	1.57
12	**Pakistan**	**2.571**	**1.57**
13	Madagascar	1.908	1.16
14	Japan	1.576	0.96
15	Nepal	1.496	0.91
16	United Republic of Tanzania	1.119	0.68
17	Sri Lanka	1.091	0.66
18	United States of America	1.059	0.65
19	Republic of Korea	0.854	0.52
20	Guinea	0.850	0.52
21	Mali	0.830	0.51
22	Lao People's Democratic Republic	0.817	0.50
23	Malaysia	0.684	0.42
24	Sierra Leone	0.604	0.37
25	Egypt	0.593	0.36
26	Iran (Islamic Republic of)	0.580	0.35
27	Democratic People's Republic of Korea	0.571	0.35
28	Democratic Republic of the Congo	0.528	0.32
	Total	**157.46**	**95.94**
	World Total	**164.125**	**100.00**

S.No.	Country	Production million(tonnes)	Per cent share
1	China	135.112	28.04
2	**India**	**103.800**	**21.54**
3	Indonesia	43.827	9.10
4	Bangladesh	33.751	7.00
5	Viet Nam	28.221	5.86
6	Thailand	23.059	4.79
7	Myanmar	21.867	4.54
8	Philippines	11.123	2.31
9	Brazil	8.985	1.86
10	Cambodia	5.853	1.21
11	Japan	5.601	1.16
12	United States of America	5.595	1.16
13	Republic of Korea	4.203	0.87
14	**Pakistan**	**4.107**	**0.85**
15	Egypt	3.783	0.79
16	Madagascar	3.386	0.70
17	Nigeria	3.045	0.63
18	Nepal	2.974	0.62
19	Sri Lanka	2.583	0.54
20	Iran (Islamic Republic of)	2.145	0.45
21	Lao People's Democratic Republic	2.044	0.42
22	Malaysia	1.777	0.37
23	Peru	1.750	0.36
24	Colombia	1.696	0.35
25	Democratic People's Republic of Korea	1.653	0.34
26	United Republic of Tanzania	1.499	0.31
27	Argentina	1.165	0.24
28	Mali	1.161	0.24
	Total	**465.762**	**96.66**
	World Total	**481.840**	**100.00**

Source: World Statistics Year Book 2011.

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

ANNEX-XV

YIELD PER HECTARE OF MAJOR RICE PRODUCING COUNTRIES IN THE WORLD: 2011 CROP

S.No.	Name of Country	Yield Kgs/hect	S.No.	Name of Country	Yield Kgs/hect
1	Egypt	6378	44	Solomon Islands	2807
2	Australia	6363	45	Suriname	2755
3	Turkey	6036	46	Myanmar	2720
4	Uruguay	5588	47	Morocco	2702
5	United States of America	5280	48	Benin	2698
6	Greece	5248	49	Kenya	2645
7	Spain	5094	50	Malaysia	2599
8	Republic of Korea	4921	51	Lao People's Democratic Republic	2501
9	Peru	4865	52	Kazakhstan	2481
10	Somalia	4680	53	Senegal	2478
11	Argentina	4537	54	Philippines	2452
12	China	4457	55	Iraq	2384
13	Italy	4030	56	Sri Lanka	2368
14	Former Yugoslav Republic of Macedonia	3995	**57**	**India**	**2354**
15	Colombia	3943	58	Costa Rica	2324
16	Nicaragua	3907	59	Bhutan	2171
17	Portugal	3897	60	Fiji	2163
18	Tajikistan	3879	61	Burundi	2161
19	Ukraine	3827	62	Hungary	2161
20	Venezuela (Bolivarian Republic of)	3800	63	Afghanistan	2133
21	Iran (Islamic Republic of)	3697	64	Dominican Republic	2103
22	Viet Nam	3688	65	Guatemala	2066
23	Rwanda	3680	66	Kyrgyzstan	2060
24	El Salvador	3652	67	Panama	2025
25	Japan	3554	68	Cambodia	2000
26	France	3520	69	Nepal	1987
27	Paraguay	3462	70	Thailand	1983
28	Chile	3460	71	Trinidad and Tobago	1929
29	Mauritania	3457	72	Swaziland	1917
30	Romania	3434	73	Papua New Guinea	1886
31	Mexico	3397	74	Cameroon	1879
32	Russian Federation	3396	75	Timor-Leste	1843
33	Bulgaria	3371	76	Gabon	1840
34	Indonesia	3320	77	Cuba	1815
35	Brazil	3264	78	Bolivia (Plurinational State of)	1786
36	Guyana	3217	79	Madagascar	1774
37	Honduras	3125	80	Turkmenistan	1729
38	Réunion	3048	81	Uganda	1726
39	Ecuador	2986	82	Togo	1673
40	Democratic People's Republic of Korea	2894	83	South Africa	1665
41	Belize	2890	84	French Guiana	1659
42	Uzbekistan	2850	**85**	**Pakistan**	**1597**
43	Bangladesh	2813		**World Avg.**	**2557**

Source: World Statistics Year Book 2011.

Annex- XVI

AVAILABILITY OF CERTIFIED SEED OF RICE PADDY: 2007-08 TO 2011-12

Year	Province	Area			Seed requirement at		Total Seed available	Availibility of seed	
		Basmati	Irri+Others	Total	Gross	Replacement @ 20 %		Gross requirement	Replacement requirement
		'------- 000 hect --------			---------- tonnes ----------			(per cent)	
2007-08	Punjab	1377	346	1723	25174	5035	10293	41	204
	Sindh		594	594	14850	2970	1788	12	60
	KPK		62	62	1550	310	207	13	67
	Balochistan		136	136	3400	680	50	1	7
	Total	1377	1138	2515	44974	8995	12338	27	137
2008-09	Punjab	1548	430	1978	29326	5865	9762	33	166
	Sindh		734	734	18350	3670	3347	18	91
	KPK		61	61	1525	305	122	8	40
	Balochistan		190	190	4750	950	225	5	24
	Total	1548	1415	2963	53951	10790	13456	25	125
2009-10	Punjab	1414	518	1932	29918	5984	24809	83	415
	Sindh		708	708	17700	3540	4590	26	130
	KPK		54	54	1350	270	134	10	50
	Balochistan		190	190	4750	950	278	6	29
	Total	1414	1470	2884	53718	10744	29811	55	277
2010-11	Punjab	1334	433	1767	26833	5367	19262	72	359
	Sindh		361	361	9025	1805	5248	58	291
	KPK		46	46	1150	230	46	4	20
	Balochistan		191	191	4775	955	1340	28	140
	Total	1334	1031	2365	41783	8357	25896	62	310
2011-12	Punjab	1121	593	1714	28282	5656	17701	63	313
	Sindh		636	636	15900	3180	7088	45	223
	KPK		50	50	1250	250	91.78	7	37
	Balochistan		171	171	4275	855	1932	45	226
	Total	1121	1450	2571	49707	9941	26813	54	270
2012-13	Punjab	995	716	1711	29849	5970	29506	99	494
	Sindh	0	512	512	12800	2560	13152	103	514
	KPK	0	51	51	1277.5	256	0	0	0
	Balochistan	0	38	38	937.5	188	0	0	0
	Total	995	1317	2312	**44864**	8973	**42658**	95	475

Notes:

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

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

Sources:

For Area: Annex-I

For Seed: FSC&RD, Islamabad