

Comparative Advantage and Policy Analysis of Pakistan's Rice (Paddy) Sector

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Abstract: The study applied the Policy Analysis Matrix (PAM) approach to examine the comparative advantage of Pakistan's rice (paddy) sector and to assess the role of government policies in the production and trade of Basmati and IRRI (International Rice Research Institute introduced variety) rice for the harvesting years 2013–2014 and 2017–2018. From the outcomes it was clear that production of Basmati paddy in Pakistan and Punjab was profitable for export purpose, which was confirmed by the Social Benefit Cost (SBC) and Domestic Resource Cost (DRC) analyses. While the DRC and SBC ratio of IRRI paddy for Pakistan and Punjab depicted a comparative disadvantage of these regions in IRRI production, whereas only Sindh showed a comparative advantage in IRRI production in 2017–2018. It was evident from the Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) outcomes, that Basmati production was being taxed in the year 2017–2018, while IRRI production was supported in the country in both harvesting years. From the Net Private Profitability (NPP) and Net Social Profitability (NSP) outcomes, the fact was further strengthened that Punjab has a comparative advantage only in Basmati production, while IRRI paddy should only be produced in Sindh for export purposes. The study suggests that the comparative advantage of Basmati and IRRI paddy can be enhanced by augmenting yield and export parity prices, while production of IRRI paddy in Punjab should be discouraged and resources should be reallocated in the next efficient enterprises. Moreover, the public and private sectors should work together to minimize the major costs, especially the costs of fertilizers and pesticides.

Keywords: Basmati and IRRI Export, Policy Analysis Matrix, comparative advantage, SBC, DRC

JEL: F13, N10, N50, O13, Q17, Q18

1. Introduction

Rice is an important cereal crop worldwide. Approximately 85 percent of rice produced globally is utilized for consumption purposes, making it the highest edible ratio as compared to wheat and other important crops. Additionally, rice is the source of earning a wage for one fifth of the population of the world (Khan and Deshmukh, 2017). Pakistani Basmati rice is known worldwide for its peculiar aroma and taste, along with the ability to expand its volume twice while soaked. Rice is the second most important staple and cash crop in Pakistan after wheat and it plays an important role in the economy of the country. Approximately 3 million tons of rice is consumed domestically, and 4 million tons is exported annually. Pakistan was ranked 4th as a major rice exporter in the world in 2017 with an 8.40 percent share in the global market (FAO, 2018).

The main varieties of rice grown in Pakistan are Basmati, IRRI and Bold Grain. Basmati as a name indicates an aromatic, long grained variety of rice cultivated in Punjab (both Indian and Pakistani Punjab). The naturally endowed environmental conditions along with its genetic capabilities give these regions a natural comparative advantage in Basmati production. The IRRI variety was introduced in the 1960s in Punjab and Sindh to overcome the problems of food shortage in the country, and successfully achieved rice self-sufficiency over the years. Through better irrigation and modern farming techniques, rice production increased to 7.50 million tons in the year 2018 (GoP, 2018).

With changing trade patterns in the world under WTO terms and conditions, both developed and developing countries are supposed to reduce protection in agriculture, resulting in an efficient allocation of resources and encouraging trade based on a comparative advantage. Pakistan being an active member of the Agreement on Agriculture (AoA), will have to reduce support to its major agricultural commodities, hence enabling them to compete globally under diversified trade patterns. This study is a small effort to reinforce the fact that productivity of agricultural goods based on a comparative advantage, results in better resource allocation, lower production cost and higher returns, ensuring economic growth and development. The Policy Analysis Matrix (PAM) approach is of major importance in finding out the comparative advantage, pattern and direction of economic policies and develop competitiveness by using proper policy incentives (Pearson et.al., 1987; Monke and Pearson, 1989; Nelson and Panggabean 1994; Masters and Winter-Nelson, 1995; Khan, 1997; Ali and Khan, 2012, Koukao, 2015; Martinez, Tadeo and Estruch., 2018). This study used the Policy Analysis Matrix

(PAM) approach to evaluate comparative advantage and the effect of government policies on paddy rice production in Pakistan.

1.1. Specific Objectives of the Study

The specific objectives of the study were to:

- (a) Determine comparative advantage and competitiveness of paddy rice production in Pakistan;
- (b) Assess policy effects on paddy rice production for export purposes;
- (c) Gauge government intervention in the Pakistan paddy rice sector and forward recommendations for improvement in the farmers' income, trade, and policy options.

1.2. Limitations of the Study

The Policy Analysis Matrix (PAM) is a static representation of farm productivity and the policy effects. Hence, the PAM framework fails to provide elasticities to facilitate decision-making for policy makers. However, the limitation can be overcome by conducting sensitivity analyses for major variables. Moreover, the present study focused only on the Pakistan Rice sector, whereas there is a need to carry out such studies for the overall agriculture system of society for timely decision-making and designing correct agricultural policies for the economy.

2. Materials and Methods

This study considered two major rice cultivating regions of Pakistan, namely Punjab and Sindh, and two famous rice varieties produced in these regions, Basmati and IRRI. The data, regarding costs and returns of Basmati and IRRI paddy was collected from Agriculture Policy Institute for the harvesting years, 2013–2014 and 2017–2018.

2.1. Analytical Framework

The Policy Analysis Matrix (PAM) was introduced by Monke and Pearson (1989) and modified by Master and Winter Nelson (1995). The framework is basically

used to evaluate comparative advantage, competitiveness, and the role of government intervention in agricultural production systems. The PAM, which is the second-best method used worldwide by economists, facilitates to evaluate a correct pattern of comparative advantage from the complex real world by estimating the interaction of agricultural activities, farm and macroeconomic policies and domestic and foreign prices, as the traditional comparative advantage lacks the ability to measure a true comparative advantage and related policy effects.

The Policy Analysis Matrix (PAM) is used to measure the comparative advantage, competitiveness and the role of government policies in Basmati and IRRI paddy production in the country. The PAM, which is a matrix of costs and revenues, consist of two accounting identities. The first identity comprises the last row of the matrix which shows that profit measured either in private or social opportunity cost terms is equal to revenue minus cost. The second identity is represented by the last column of the matrix which measures the policy effects as the difference between observed and efficiency values.

Table 1: Structure of the Policy Analysis Matrix (PAM)

Budget Items	Private Budget at Market Prices	National Budget at National Opportunity Cost	Effect of Policy (Divergence)
Revenue	A	F	K ^c
Labor Costs	B	G	L ^d
Capital Costs	C	H	M ^e
Tradable Input Costs	D	I	N ^f
Profit	E ^a	J ^b	O ^g

Source: Adopted from Khan 1997, unpublished Ph.D. thesis, Department of Agricultural Economics, University of Kentucky, USA. pp. 1-49.

Where:

- A = Total Revenue at Market Prices ($P_m \times Q$)
- B = Labor Cost at Market Prices ($w_m \times l$)
- C = Capital Cost at Market Prices ($r_m \times k$)
- D = Tradable Input Cost at Market Prices ($P_m \times Q$)
- E^a = Net Private Profitability [$A - (B + C + D)$]
- F = Total Revenue at Social Prices ($P_s \times Q$)
- G = Labor Cost at Social Prices ($w_s \times l$)
- H = Capital Cost at Social Prices ($r_s \times k$)
- I = Tradable Input Cost at Social Prices ($P_s \times Q$)
- J^b = Net Social Profitability [$F - (G + H + I)$]

K^c	=	Output Transfer (A-F)
L^d	=	Labor Market Distortions (B-G)
M^e	=	Capital Market Distortions (C-H)
N^f	=	Other Input Transfers (D-I)
O^g	=	Total Policy Effects [E-J = K - (L+M+N) = NNP - NSP = PSE _{Total}]
P_m	=	Market Price of Output
Q	=	Quantity of Output
w_m	=	Wage Rate at Market Price
l	=	Labor
k	=	Capital
r_m	=	Interest Rate at Market Price
P_s	=	Social Price of Output
w_s	=	Wage Rate at Social Price
r_s	=	Interest Rate at Social Price

The PAM facilitates to generate the measures of comparative advantage (DRC and SBC ratios) and that of policy effects (NPC and EPC ratios), which helps in making comparisons among different commodities. These measures are free of measurement units which makes comparisons among commodities convenient.

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|-------------------------------------|-------|---|-----------------|
| 1. Domestic Resource Cost Ratio | (DRC) | = | $(G+H) / (F-I)$ |
| 2. Social Benefit Cost Ratio | (SBC) | = | $F / (G+H+I)$ |
| 3. Nominal Protection Coefficient | (NPC) | = | A / F |
| 4. Effective Protection Coefficient | (EPC) | = | $(A-D) / (F-I)$ |

2.2. Domestic Resource Cost (DRC) and Social Benefit Cost (SBC) Ratio

In the PAM framework, $DRC = (G+H) / (F-I)$. G and H are domestic inputs (land, labor, and capital), F is revenue, while I shows cost of tradable input used. A DRC value greater than one indicates an inefficiency of a country in producing a particular commodity. On the other hand, if a DRC value is less than one it shows a comparative advantage in the production of a commodity.

The $SBC = F / (G+H+I)$, where F is revenue, while G, H, I represents costs of non-tradable and tradable inputs valued at social prices. An SBC ratio greater than one indicates that a country is an efficient producer of a commodity, while if an SBC ratio is less than one it means that the production of a commodity is not profitable for the country.

2.3. Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC)

Similar to efficiency, the components of policy analysis can be measured directly from the components of the PAM. The Nominal Protection Coefficient is one of the components of PAM, the ratio of domestic to border prices of a product. Using elements of Table 1, $NPC = A / F$, where A is domestic, while F is border price of a commodity. An NPC value greater than one indicates a country's inefficiency in the production of a particular commodity and whether prices have been tremendously affected by government policies and other factors, while if an NPC value is less than one, it indicates that production is taxed due to market failure or involvement of the government.

The Effective Protection Coefficient is considered a superior measure of incentives than the Nominal Protection Coefficient. In the Policy Analysis Matrix framework, $EPC = (A-D) / (F-I)$ where A is revenue and D is tradable input costs at market prices, while F represents revenue and I shows tradable input cost valued at border prices. An EPC value exceeding unity is an indication of protection to the domestic producer, while an EPC value of less than one is the indicator of disincentives to the producer of a product. An EPC equal to one shows that producers are neither protected nor taxed. If an EPC is below zero it will indicate i) the social prices value added is negative ii) the value added in domestic prices is negative. The first condition shows that the economy is having losses and losing foreign exchange by producing a particular commodity, while the second case shows that producer is unable to remain in the business anymore until the government provides subsidy to the producers.

3. Results and Discussion

3.1. Estimation of PAM Budgets and Underlying Assumptions

The Policy Analysis Matrix (PAM) is a double entry bookkeeping identity. One identity shows profitability as the difference between revenue and costs, while the other measures the policy effects as the difference between observed values and values at opportunity cost. The peculiar structure of the Policy Analysis Matrix (PAM) gives a detailed explanation of complex relationships between variables.

As given in the tables of Appendix B, the first two columns of the PAM budget contain budget items and their total values at market price. The value of tradable inputs is estimated from column two based on the proportion of tradable inputs presented in the third column of the PAM budgets. The fourth and fifth columns contain the market values of budget items and opportunity cost values of inputs and outputs of budget items that are obtained by multiplying tradable inputs in column three with the foreign exchange premium of 3 percent for the year 2013–2014 and with the foreign exchange premium of 6 percent for the year 2017–2018. Any transfer of resources due to government interventions is presented in the last column of the PAM budgets.

3.1.1. Output

The top two rows of the PAM budgets in the tables of Appendix B present the paddy rice values first at market prices and then at national opportunity cost values. The market price of paddy rice is the wholesale price per 40 kg. The total revenue of paddy rice at market price is yield multiplied by paddy rice price per 40 kg per acre. The total revenue at national opportunity cost values are calculated by multiplying the paddy rice yield per acre by export parity price and the foreign exchange premium.

3.1.2. Labor

In the PAM budgets, labor is listed after output. The opportunity cost of labor is the marginal value product of labor, that is also the shadow price of labor foregone while it is employed in the production of paddy rice. The shadow price of labor will be presented by wage in a perfectly competitive economy. By adding non-tradable elements of tradable inputs, indirect labor cost is estimated.

3.1.3. Capital

Capital is the next item after output and labor in the PAM budget. In the PAM perspective, capital includes land rental values, markup and other capital inputs used indirectly in the production of paddy rice. The land rental value is the market price of land. The return of land in the best alternative use is the opportunity cost (shadow price) of land. The indirect capital cost is estimated similar to labor after estimating tradable inputs and labor costs of intermediate inputs.

3.1.4. Tradables

Tradable inputs are the last item in the PAM budgets. Tradables are those inputs which can be traded in the international market and are used directly or indirectly in the production of agricultural commodities. The tradable input cost includes the tradable portion of inputs after excluding the non-tradable portion that is further divided to intermediate inputs labor and capital. The opportunity cost of tradable inputs is the product of tradable inputs and the foreign exchange premium of 3 percent for the year 2013–2014 and foreign exchange premium of 6 percent for the year 2017–2018.

3.2. Policy Analysis Matrix (PAM) Results

3.2.1. Net Private Profitability (NPP) of Basmati and IRRI Paddy

The difference between revenue and cost valued at market price is the Net Private Profitability that can be used interchangeably for competitiveness.

Table 2: Net Private Profitability (NPP) of Basmati and IRRI Paddy (2013–2014 and 2017–2018) (Rs/Acre)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	21827.15	11120.60	8807.07	11632.96
Punjab	21827.15	11120.60	-1120.89	29.50
Sindh	--	--	10554.62	17514.40

Source: Author's calculation from the PAM Budgets in the Appendix.

Note: Basmati is not cultivated in Sindh.

Table 2 reveals that the Net Private Profitability (NPP) of Basmati reduced in 2017–2018 as compared to 2013–2014, due to lower market prices of Basmati paddy and yield per acre in the later year. The Net Private Profitability for IRRI paddy was highest in Sindh in both years while lowest in Punjab in both harvesting years. The reason behind lower Profitability in Punjab was a lower yield per acre and high cost of production with respect to land rent, irrigation cost, seed and sowing cost and the cost of fertilizers.

3.2.2. Net Social Profitability (NSP) of Basmati and IRRI Paddy

The Net Social Profitability reflects the relative economic efficiency since output (F) and inputs (G+H+I) are valued at social prices. If the Net Social Profitability is positive, the nation has a comparative advantage in production of a commodity, while a negative Net Social Profitability specifies that country cannot produce without support from the government, and production of the commodity is not a valuable addition to the country's stock of commodities (Kanaka and Chinnaduari, 2013).

Table 3: Net Social Profitability (NSP) of Basmati and IRRI Paddy (2013–2014 and 2017–2018) (Rs/Acre)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	12458.34	48780.80	-2790.80	-1154.78
Punjab	12458.34	48780.80	-12939.45	-9430.62
Sindh	--	--	-734.71	1931.55

Source: Author's calculation from the PAM Budgets in the Appendix.

Note: Basmati is not cultivated in Sindh.

As given in Table 3, the Net Social Profitability for Basmati paddy in Punjab was Rs. 12458.34 and Rs. 48780.80 per acre in the year 2013–2014 and 2017–2018 respectively. The Net Social Profitability of IRRI paddy in Pakistan and Punjab was negative in both harvesting years. The negative Net Social Profitability indicates an inefficiency of these regions in production of IRRI paddy. In the years 2017–2018, the highest Net Social Profitability for IRRI paddy was observed in Sindh where it was Rs. 1931.55 per acre. The Net Social Profitability in Sindh was higher because of better yield in the province.

3.3. Measuring Comparative Advantage

3.3.1. Domestic Resource Cost (DRC) Analysis

The development of Domestic Resource Cost analysis by Bruno (1967) and Krueger in the 1960s provides a mechanism to see through market distortions and capture an exact picture of the comparative advantage. In the context of the PAM methodology, $DRC = (G + H) / (F - I)$ is the ratio of costs of domestic inputs (labor and capital) to its tradable value added at social prices. There is an inverse relationship

between the DRC ratio and comparative advantage. A country has a comparative advantage in any activity if ($NSP > 0$; $DRC < 1$). On the other hand, if ($NSP < 0$; $DRC > 1$), it indicates that country is an inefficient producer of that commodity.

Table 4: Domestic Resource Cost of Basmati and IRRI Paddy (2013–2014 and 2017–2018)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	0.67	0.36	1.17	1.05
Punjab	0.67	0.36	2.23	1.53
Sindh	--	--	1.03	0.93

Source: Author's calculation from the PAM Budgets in the Appendix.

Note: Basmati is not cultivated in Sindh.

As given in Table 4, the DRC co-efficients for Basmati paddy were less than 1 for both harvesting years, indicating a comparative advantage of Basmati production in the country. The DRC of IRRI paddy for the country was exceeding unity except for Sindh in 2017–2018, clearly specifying the comparative disadvantage of the country and provinces in IRRI production, except for Sindh in the later year.

3.3.2. Social Benefit Cost (SBC) Analysis

The Social Benefit Costs (SBC) analysis, $SBC = F / (G + H + I)$, in the PAM framework, is the ratio of the net social benefit to the social opportunity costs of resources utilized in the production process. There is a positive relationship between the SBC analysis and comparative advantage. A country is competent in the production of a commodity if the SBC ratio exceeds unity. Whereas the country has no comparative advantage if the SBC ratio is less than unity, and the scarce resources are not properly allocated/utilized.

Table 5. Social Benefit Cost of Basmati and IRRI paddy (2013–2014 and 2017–2018)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	1.28	2.06	0.9	0.96
Punjab	1.28	2.06	0.68	0.78
Sindh	--	--	0.98	1.05

Source: Author's calculation from the PAM Budgets in the Appendix.

Note: Basmati is not cultivated in Sindh.

Table 5 shows the outcomes of the Social Benefit Cost analyses for Basmati and IRRI production in Pakistan, Punjab, and Sindh in both harvesting years. The results support the DRC outcomes that Punjab has a comparative advantage in Basmati production in both years, while IRRI production is only advantageous in Sindh in the harvesting year 2017–2018.

3.4. The Indicators of Policy Effects

3.4.1. Nominal Protection Coefficient (NPC) Ratio

In the PAM framework, $NPC = A / F$, where A is the revenue at market prices and F is the revenue at social opportunity cost prices. The value of the NPC below unity implies that the commodity production is taxed. Alternatively, when the NPC value is greater than one, it indicates that the commodity production is supported through policies and the country is an inefficient producer of that commodity.

Table 6: Nominal Protection Coefficient of Basmati and IRRI Paddy (2013–2014 and 2017–2018)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	1.14	0.58	1.32	1.28
Punjab	1.14	0.58	1.37	1.23
Sindh	--	--	1.29	1.29

Source: Author's calculation from the PAM Budgets in the Appendix.
Note: Basmati is not cultivated in Sindh.

Table 6 shows the Nominal Protection Coefficient (NPC) of Basmati and IRRI paddy production for export promotion. The NPC values for Basmati paddy in Punjab specify that Basmati farmers were supported in the year 2013–2014, while they were taxed in the year 2017–2018. The NPC values of IRRI paddy in the years 2013–2014 and 2017–2018, were greater than one for Pakistan, Punjab and Sindh, which implies that farmers received more than the world reference prices and were supported in both harvesting years.

3.4.2. Effective Protection Coefficient (EPC) Ratio

An EPC value exceeding unity indicates support to the domestic farmers of the commodity, while an EPC value below unity shows negative incentives and that the domestic farmers are taxed.

Table 7: Effective Protection Coefficient of Basmati and IRRI Paddy (2013–2014 and 2017–2018)

Country/ Province	Export Promotion Regime			
	Basmati		IRRI	
	2013–2014	2017–2018	2013–2014	2017–2018
Pakistan	1.22	0.49	1.5	1.39
Punjab	1.22	0.49	2.03	1.48
Sindh	--	--	1.52	1.45

Source: Author's calculation from the PAM Budgets in the Appendix.
Note: Basmati is not cultivated in Sindh.

Table 7 depicts the results of the Effective Protection Coefficient (EPC) for Basmati and IRRI paddy. Like the NPC, the EPC values for Basmati paddy in Punjab indicate that farmers were supported in the year 2013–2014 and were taxed in the year 2017–2018. The IRRI paddy growers in Pakistan, Punjab, and Sindh enjoyed a positive support from the government in input and output markets in the years 2013–2014 and 2017–2018 respectively.

4. Conclusions and Recommendations

4.1. Conclusions

It is evident from PAM analyses that in the harvesting years 2013–2014 and 2017–2018, Basmati production was a profitable enterprise in Punjab. The production of IRRI paddy was not profitable in all farming regions in both years except Sindh, in 2017–2018. In the year 2013–2014, the Net Private Profitability (NPP) indicating competitiveness of Basmati was higher as compared to 2017–2018. In the years 2013–2014 and 2017–2018, the Net Private Profitability for IRRI paddy was the highest in Sindh, followed by Pakistan and Punjab. The DRC and SBC analyses clearly showed a comparative advantage of Pakistan and Punjab in the production of Basmati paddy, whereas Pakistan, Punjab and Sindh demonstrated a comparative disadvantage in the production of IRRI paddy, except for Sindh in 2017–2018. The study further demonstrated that Basmati production was profitable

in Punjab under an export promotion regime, however, Basmati farmers were discouraged through the implementation of taxes in the year 2017–2018. In the years 2013–2014, Sindh had a comparative disadvantage in the production of IRR1, while IRR1 producers were supported in both harvesting years. Punjab had a comparative disadvantage in the production of IRR1 in both harvesting years, even though the government had supported IRR1 production in the province. The policy measures should be used to discourage the production of IRR1 in Punjab so that precious resources are liberated and utilized in the most efficient alternative enterprise production in the province.

4.2. Recommendations

The most important recommendations based on the study are presented as follows:

- (a) Punjab shows a comparative advantage in Basmati paddy production for export purpose, therefore policy makers must formulate policies which further strengthen production and trade of Basmati paddy in the region.
- (b) Punjab has a comparative disadvantage in IRR1 paddy production, the government should therefore discourage IRR1 production in Punjab and utilize resources in the next best alternative.
- (c) Furthermore, Sindh has comparative advantage in IRR1 production for export purpose which might be enhanced by improving yield and use of modern methods of cultivation in addition to subsidizing IRR1 production in Sindh.
- (d) It was recommended that world level prices must be ensured to Basmati and IRR1 growers for the encouragement of Basmati and IRR1 production and trade.
- (e) Moreover, the study further suggests providing farmers and other stake holders with updated and uninterrupted information regarding input and output prices, especially the knowledge about improved rice varieties. Agricultural and macroeconomic policies should be ensured to enhance competitiveness of Basmati and IRR1 farmers.
- (f) It is observed that Pakistan is facing a food policy crisis instead of a food shortage. Therefore, honest and sincere efforts on behalf of policy makers are required to make farm and trade policies, which are consistent with the true pattern of comparative advantage of the country, in order to ensure food self-sufficiency and availability of food at lower prices.

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APPENDICES

Appendix A

Table A.1: Economic Export Parity Price of Basmati Paddy on the Basis of the FOB (Karachi) Price (2013–2014)

Items	Values
Average Fob Karachi Price (US\$/Tonne)	1079.00
Average Fob Karachi Price @ FXR Rs. 98.75/01 US \$ (Rs./40 kg)	4262.00
Expenses from Sheller/Market to Export Point (Rs./40 kg)	225.00
Producer area Market Level Price of Rice (Rs./40 kg)	4037.00
Value of Products Recoverable from 100 kgs. Paddy	5708.00
Husking/Processing/Financial Charges	288.00
Export Parity Price of Paddy at Mill-gate (Rs./100 kg)	5420.00
Export Parity Price of Paddy at Mill-gate (Rs./40 kg)	2168.00
Export Parity Price of Paddy at Market level (Rs./40 kg)	2168.00
Marketing Expenses (Rs./40 Kg)	40.00
Export Parity Price at Farm level (Rs./40 Kg)	2128.00

Source: Price policy for Rice: 2014-15 Crop, Agriculture Prices Commission Government of Pakistan, Islamabad.

Table A.2: Economic Export Parity Price of the Basmati Paddy on the basis of the FOB (Karachi) Price (2017–2018)

Items	Values
Average Fob Karachi Price (US\$/Tonne)	1105.84
Average Fob Karachi Price @ FXR Rs.132/01US \$ (Rs. /40 kg)	5839.00
Expenses from Sheller/Market to Export Point (Rs./40 kg)	225.00
Producer area Market Level Price of Rice (Rs./40 kg)	5614.00
Value of Products Recoverable from 100 kgs. Paddy	7869.00
Husking/Processing/Financial Charges	288.00
Export Parity Price of Paddy at Mill-gate (Rs./100 kg)	7581.00
Export Parity Price of Paddy at Mill-gate (Rs./40 kg)	3032.00
Export Parity Price of Paddy at Market level (Rs./40 kg)	3032.00
Marketing Expenses (Rs./40 Kg)	50.00
Export Parity Price at Farm level (Rs./40 Kg)	2982.00

Source: Price policy for Rice: 2018-19 Crop, Agriculture Prices Commission Government of Pakistan, Islamabad.

Table A.3: Economic Export Parity Price of IRRI Paddy on the Basis of the FOB (Karachi) Price (2013–2014)

Items	Values
Average Fob Karachi Price (US\$/Tonne)	468.00
Average Fob Karachi Price @ FXR Rs. 98.75/01 US\$ (Rs./40 kg)	1849.00
Expenses from Sheller/Market to Export Point (Rs./40 kg)	125.00
Producer area Market Level Price of Rice (item 2-item 3) (Rs./40 kg)	1724.00
Value of Products Recoverable from 100 kg Paddy	2193.00
Husking/Processing/Financial Charges	288.00
Export Parity Price of Paddy at Mill-gate (Rs./100 kg)	1905.00
Export Parity Price of Paddy at Mill-gate (Rs./40 kg)	762.00
Export Parity Price of Paddy at Market level (Rs./40 kg)	762.00
Marketing Expenses (Rs./40 Kg)	40.00
Export Parity Price at Farm level (Rs./40 Kg)	722.00

Source: Price policy for Rice: 2014-15 Crop, Agriculture Prices Commission Government of Pakistan, Islamabad

Table A.4: Economic Export Parity Price of IRRI Paddy on the Basis of the FOB (Karachi) Price (2017–2018)

Items	Values
Average Fob Karachi Price (US\$/Tonne)	362.00
Average Fob Karachi Price @ FXR Rs. 132/01 US \$ (Rs./40 kg)	1909.00
Expenses from Sheller/Market to Export Point (Rs./40 kg)	125.00
Producer area Market Level Price of Rice (item 3-item 4) (Rs./40 kg)	1784.00
Value of Products Recoverable from 100 kgs. Paddy	2261.00
Husking/Processing/Financial Charges	288.00
Export Parity Price of Paddy at Mill-gate (Rs./100 kg)	1973.00
Export Parity Price of Paddy at Mill-gate (Rs./40 kg)	789.00
Export Parity Price of Paddy at Market level (Rs./40 kg)	789.00
Marketing Expenses (Rs./40 Kg)	50.00
Export Parity Price at Farm level (Rs./40 Kg)	739.00

Source: Price Policy For Rice: 2018–2019 Crop, Agriculture Prices Commission Government of Pakistan, Islamabad.

Table A.5: Allocation of Costs between Traded and Non Traded Labor and Capital

Inputs	Total	Traded	Non-Traded	Labor	Capital
Product and By Products	100.00	100.00	0.00	0.00	0.00
Pre-Sowing Operation (With Tractor)	100.00	85.00	15.00	100.00	0.00
Seed and Sowing	100.00	87.00	13.00	50.00	50.00
Intercultural Practices	100.00	85.00	15.00	50.00	50.00
Irrigation (Canal)	100.00	50.00	50.00	100.00	0.00
Irrigation (Tube well)	100.00	75.00	25.00	100.00	0.00
Manures, Fertilizers and Chemicals	100.00	85.00	15.00	100.00	0.00
Land Revenue and Local Taxes	100.00	5.00	95.00	100.00	0.00
Harvesting & Threshing	100.00	5.00	95.00	100.00	0.00
Transport and Marketing	100.00	5.00	95.00	25.00	75.00

Sources: Institute of Development Studies report, The University of Agriculture Peshawar, Publication No.18.

Table A.6: Standard Conversion Factor and Shadow Exchange Rate

1. The shadow exchange rate, which is used to analyze the comparative advantage of any economic activity, is estimated with the help of the Standard Conversion Factor (SCF). Following the procedures from “Economic Analysis of Projects”.

We define:

$$\text{SCF} = \frac{X+M}{(X-T_x) + (M+T_m)}$$

Where

X	=	Value of Exports
M	=	Value of Imports
T _x	=	Value of Taxes on Exports
T _m	=	Value of Taxes on Imports

2. Alternatively,

$$\text{SER} = \text{OER} / \text{SCF}$$

Where the OER is the official exchange rate and the SER is the shadow exchange rate. Once the standard conversion factor is derived, then

$$\text{SER} = \text{OER} / \text{SCF}$$

This approach was used in determining the shadow exchange rate.

Standard Conversion Factor and Shadow Exchange Rate (2013–2014).

		Rs. Million		
1.	Total Value of Exports	2583463.00		
2.	Total Value of Imports	4630521.00		
3.	Export Duties	476.00		
4.	Import Duties	235596.00		
5.	Official Exchange Rate	98.75		
SCF	=	X + M / (X - T_x) + (M + T_m)		
		= 7213984.00 / 7449104.00	= 0.97	
SCF	=	0.97		
SER	=	OER / SCF	= 98.75 / 0.97	= 101.97
Premium	=	SER / OER	= 101.97 / 98.75	= 1.03

Source: 1. Economic Survey of Pakistan 2013-2014
2. Yearbook 2017-2018, Federal Bureau of Revenue and Statistics.

Thus, the outcome specifies that the rupee was appreciated (the dollar was underpriced against the rupee) by about 3 percent in 2013–2014.

Standard Conversion Factor and Shadow Exchange Rate (2017–2018).

		Rs. Million
1.	Total Value of Exports	2555043.00
2.	Total Value of Imports	6694897.00
3.	Export Duties	859.00
4.	Import Duties	538019.00
5.	Official Exchange Rate 1	32.00

$$\text{SCF} = \frac{X + M}{(X - T_x) + (M + T_m)}$$

$$= \frac{9249940.00}{9787100.00} = 0.94$$

$$\text{SCF} = 0.94$$

$$\text{SER} = \text{OER} / \text{SCF} = 132.00 / 0.94 = 139.67$$

$$\text{Premium} = \text{SER} / \text{OER} = 139.67 / 132.00 = 1.06$$

Source: 1. Economic Survey of Pakistan 2018–2019
2. Yearbook 2017–2018, Federal Bureau of Revenue and Statistics.

Thus, the outcome shows that the rupee was appreciated (the dollar was underpriced against the rupee) by about 6 percent in 2017–2018.

Appendix B

Table B.1: PAM Budget for the Basmati Paddy Harvesting Year 2013–2014 for Punjab (Export Promotion Regime) Rs/Acre

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 3% Tradable	Transfer
Product & Byproducts	65494.50	65494.50	65494.50		
Export Parity (2013-14)	56019.60	56019.60	56019.60	57700.19	7794.31
Labor	12341.55	0.00	12341.55	12341.55	0.00
Management	1030.00	0.00	1030.00	1030.00	0.00
Labor for Bund making	344.40	0.00	344.40	344.40	0.00
Manual Weeding	403.90	0.00	403.90	403.90	0.00
Labor for Irrigation & Water Course Cleaning	2140.47	0.00	2140.47	2140.47	0.00
Indirect (Input)	8422.78	0.00	8422.78	8422.78	0.00
Capital	12175.80	0.00	12175.80	13175.80	-1000.00
Land Rent Value	9500.00	0.00	9500.00	10500.00	-1000.00
Mark Up	1564.69	0.00	1564.69	1564.69	0.00
Indirect (Input)	1111.11	0.00	1111.11	1111.11	0.00
Tradables	28683.89	19150.00	19150.00	19724.50	-574.50
Land Preparation	5150.00	4377.50	4377.50	4508.83	-131.33
Seed & Sowing Operations	3485.00	3031.95	3031.95	3122.91	-90.96
Intercultural Practices	712.75	605.84	605.84	624.01	-18.18
Irrigation (Canal)	85.00	42.50	42.50	43.78	-1.28
Irrigation (Tube Well)	8529.03	6396.77	6396.77	6588.68	-191.90
Fertilizers & FYM	5199.17	4419.29	4419.29	4551.87	-132.58
Land Revenue & Local Taxes	71.00	3.55	3.55	3.66	-0.11
Harvesting & Threshing	4285.44	214.27	214.27	220.70	-6.43
Transport & Marketing	1166.50	58.33	58.33	60.07	-1.75
Profitability			21827.15	12458.34	9368.81
DRC	0.67				
SBC	1.28				
NPC	1.14				
EPC	1.22				
Yield (40kg/ Acre)	26.33				
Wholesale Price of Basmati Paddy (Rs./40 Kg)	2260.00				
Total Value of Production at Market Price	59494.50				
Value of Paddy Straw (By-Product)	6000.00				
Gross Value of Output	65494.50				
Export Parity Price of Paddy at Farm Level (Rs./40Kg)	2128.00				
Total Value of Export Parity Price	56019.60				

FEP* = Foreign Exchange Premium

Table B.2: PAM Budget for the Basmati Paddy Harvesting Year 2017–2018 for Punjab
(Export Promotion Regime) Rs/Acre

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 6% Tradable	Transfer
Product & Byproducts	55120.00	55120.00	55120.00		
Export Parity (2017-18)	89460.00	89460.00	89460.00	94827.60	-39707.60
Labor	11645.64	0.00	11645.64	11645.64	0.00
Management	1563.00	0.00	1563.00	1563.00	0.00
Labor for Bund Making	442.80	0.00	442.80	442.80	0.00
Manual Weeding	460.00	0.00	460.00	460.00	0.00
Labor for Irrigation & Water Course Cleaning	2752.00	0.00	2752.00	2752.00	0.00
Indirect (In Input)	6427.84	0.00	6427.84	6427.84	0.00
Capital	14897.86	0.00	14897.86	15897.86	-1000.00
Land Rent Value	11500.00	0.00	11500.00	12500.00	-1000.00
Mark Up	1732.00	0.00	1732.00	1732.00	0.00
Indirect (Input)	1665.86	0.00	1665.86	1665.86	0.00
Tradables	25549.62	17455.92	17455.92	18503.27	-1047.35
Land Preparation	3962.00	3367.7	3367.70	3569.76	-202.06
Seed & Sowing Operation	5577.00	4852	4851.99	5143.11	-291.12
Intercultural Practices	534.60	454.41	454.41	481.67	-27.26
Irrigation (Canal)	95.72	47.86	47.86	50.73	-2.87
Irrigation (Tube Well)	6241.00	4680.8	4680.75	4961.60	-280.85
Fertilizers & FYM	4495.30	3821	3821.01	4050.27	-229.26
Land Revenue & Local Taxes	71.00	3.55	3.55	3.76	-0.21
Harvesting & Threshing	2800.00	140.00	140.00	148.40	-8.40
Transport & Marketing	1773.00	88.65	88.65	93.97	-5.32
Profitability			11120.60	48780.80	-37660.20
DRC	0.36				
SBC	2.06				
NPC	0.58				
EPC	0.49				
Yield (40 kg/ Acre)	30.00				
Wholesale Market Price of Basmati Paddy (Rs./40Kg)	1604.00				
Total Value of Production at Market Price	48120.00				
Value of Paddy Straw (By-Product)	7000.00				
Gross Value of Output	55120.00				
Export Parity Price of Paddy at Farm Level (Rs./40 Kg)	2982.00				
Total Value of Export Parity Price	89460.00				

FEP* = Foreign Exchange Premium

Table B.3: PAM Budget for the IRRI Paddy Harvesting Year 2013–2014 for Pakistan

Items	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 3% Tradable	Transfer
Product & Byproducts	33326.01	33326.01	33326.01		
<i>Export Parity (2013–2014)</i>	24549.31	24549.31	24549.31	25285.79	8040.22
Labor	7189.89	0.00	7189.89	7189.89	0.00
Management	797.22	0.00	797.22	797.22	0.00
Labor for Bund Making	364.55	0.00	364.55	364.55	0.00
Manual Weeding	439.83	0.00	439.83	439.83	0.00
Labor for Irrigation & Water Course Cleaning	1196.93	0.00	1196.93	1196.93	0.00
Indirect (Input)	4391.35	0.00	4391.35	4391.35	0.00
Capital	8743.82	0.00	8743.82	12043.92	-3300.10
Land Rent Value	6549	0.00	6549.00	9849.10	-3300.10
Mark Up	1011.18	0.00	1011.18	1011.18	0.00
Indirect (Input)	1183.64	0.00	1183.64	1183.64	0.00
Tradables	14160.22	8585.23	8585.23	8842.79	-257.56
Land Preparation	3004.08	2553.47	2553.47	2630.08	-76.60
Seed & Sowing Operation	2215.97	318.22	1927.89	1985.73	-57.84
Intercultural Practices	180.32	153.27	153.27	157.87	-4.60
Irrigation (Canal)	52.60	26.30	26.299345	27.09	-0.79
Irrigation (Tube Well)	783.10	587.33	587.325	604.94	-17.62
Fertilizers & FYM	3675.95	3124.56	3124.56	3218.30	-93.74
Land Revenue & Local Taxes	73.18	3.66	3.66	3.77	-0.11
Harvesting & Threshing	2734.91	136.75	136.75	140.85	-4.10
Transport & Marketing	1440.11	72.01	72.01	74.17	-2.16
Profitability			8807.07	-2790.80	11597.88
DRC	1.17				
SBC	0.90				
NPC	1.32				
EPC	1.50				
Yield (40Kg/Acre)	43.93				
Wholesale Market Price of IRRI Paddy (Rs/40Kg)	696.95				
Total Value of Production at Market Price (Rs./40kg)	30617.01				
Value of Paddy Straw (By-Product)	2709.00				
Gross Value of Output	33326.01				
Export Parity Price of Paddy at Farm Level (Rs/40Kg)	558.83				
Total value at Export Parity Price	24549.31				

(Export Promotion Regime) Rs/Acre
FEP* = Foreign Exchange Premium

Table B.4: PAM Budget for the IRRI Paddy Harvesting Year 2013–2014
for Punjab (Export Promotion Regime) Rs/Acre

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 3% Tradable	Transfer
Product & Byproducts	38381.00	38381.00	38381.00		
<i>Export Parity (2013–2014)</i>	27255.50	27255.50	27255.50	28073.17	10307.84
Labor	10103.36	0.00	10103.36	10103.36	0.00
Management	1030.00	0.00	1030.00	1030.00	0.00
Labor for Bund Making	402.50	0.00	402.50	402.50	0.00
Manual Weeding	468.30	0.00	468.3	468.3	0.00
Labor for Irrigation & Water Course Cleaning	2087.40	0.00	2087.40	2087.40	0.00
Indirect (Input)	6115.16	0.00	6115.16	6115.16	0.00
Capital	12374.47	0.00	12374.47	13374.47	-1000.00
Land Rent Value	9500.00	0.00	9500.00	10500.00	-1000.00
Mark Up	1396.99	0.00	1396.99	1396.99	0.00
Indirect (Input)	1477.48	0.00	1477.48	1477.48	0.00
Tradables	24616.7	17024.05	17024.05	17534.77	-510.72
Land Preparation	4725.00	4016.25	4016.25	4136.74	-120.49
Seed & Sowing Operation	3325.00	2892.75	2892.75	2979.53	-86.78
Intercultural Practices	888.05	754.8425	754.84	777.49	-22.65
Irrigation (Canal)	85.00	42.5	42.5	43.78	-1.28
Irrigation (Tube Well)	4380.68	3285.51	3285.51	3384.08	-98.57
Fertilizers & FYM	6839.44	5813.524	5813.52	5987.93	-174.41
Land Revenue & Local Taxes	71.00	3.55	3.55	3.66	-0.11
Harvesting & Threshing	2625.68	131.284	131.28	135.22	-3.94
Transport & Marketing	1676.85	83.8425	83.84	86.36	-2.52
Profitability			-1120.89	-12939.45	11818.56
DRC	2.23				
SBC	0.68				
NPC	1.37				
EPC	2.03				
Yield (40 Kg/Acre)	37.75				
Wholesale Market Price of IRRI Paddy (Rs./40 Kg)	924.00				
Total Value of Production at Market Price (Rs./40kg)	34881.00				
Value of Paddy Straw (By-Product)	3500.00				
Gross Value of Output	38381.00				
Export Parity Price of Paddy at Farm Level (Rs./40Kg)	722.00				
Total Value at Export Parity Price	27255.50				

FEP* = Foreign Exchange Premium

Table B.5: PAM Budget for the IRRI Paddy Harvesting Year 2013–2014 for Sindh
(Export Promotion Regime) Rs/Acre

<i>Item</i>	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 3% Tradable	Transfer
Product & Byproducts	48089.00	48089.00	48089.00		
Export Parity (2013-14)	36172.20	36172.20	36172.20	37257.37	10831.63
Labor	11189.24	0.00	11189.24	11189.24	0.00
Management	1030.00	0.00	1030.00	1030.00	0.00
Labor for Bund Making	700.00	0.00	700.00	700.00	0.00
Manual Weeding	852.25	0.00	852.25	852.25	0.00
Labor for Irrigation & Water Course Cleaning	1958.14	0.00	1958.14	1958.14	0.00
Indirect (Input)	6648.85	0.00	6648.85	6648.85	0.00
Capital	11088.55	0.00	11088.55	11088.55	0.00
Land Rent Value	8000.00	0.00	8000.00	8000.00	0.00
Mark Up	1266.23	0.00	1266.23	1266.23	0.00
Indirect (Input)	1822.32	0.00	1822.32	1822.32	0.00
Tradables	23727.76	15256.59	15256.59	15714.28	-457.70
Land Preparation	6350.00	5397.50	5397.50	5559.43	-161.93
Seed & Sowing Operation	4240.00	3688.80	3688.80	3799.46	-110.66
Intercultural Practices	452.55	384.67	384.67	396.21	-11.54
Irrigation (Canal)	88.78	44.39	44.39	45.72	-1.33
Irrigation (Tube Well)	339.30	254.48	254.48	262.11	-7.63
Fertilizers & FYM	6092.37	5178.51	5178.51	5333.87	-155.36
Land Revenue & Local Taxes	105.00	5.25	5.25	5.41	-0.16
Harvesting & Threshing	3936.56	196.83	196.83	202.73	-5.90
Transport & Marketing	2123.20	106.16	106.16	109.34	-3.18
Profitability			10554.62	-734.71	11289.33
DRC	1.03				
SBC	0.98				
NPC	1.29				
EPC	1.52				
Yield (40Kg/Acre)	50.10				
Wholesale Market Price of IRRI Paddy (Rs./40 Kg)	890.00				
Total Value of Production at Market Price (Rs./40kg)	44589.00				
Value of Paddy Straw (By-Product)	3500.00				
Gross Value of Output	48089.00				
Export Parity Price Of Paddy at Farm Level (Rs./40Kg)	722.00				
Total value at Export Parity Price	36172.20				

FEP* = Foreign Exchange Premium

Table B.6: PAM Budget for the IRRI Paddy Harvesting Year 2017–2018 for Pakistan
(Export Promotion Regime) Rs/Acre

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value	Transfer
Product And Byproduct	36080.80	36080.80	36080.80		
Export Parity (2017-18)	26695.45	26695.45	26695.45	28297.18	7783.62
Labor	7013.69	0.00	7013.69	7013.69	0.00
Management	1158.18	0.00	1158.18	1158.18	0.00
Labor for Bund Making	401.02	0.00	401.02	401.02	0.00
Manual Weeding	462.59	0.00	462.59	462.59	0.00
Labor for Irrigation & Water Course Cleaning	1295.36	0.00	1295.36	1295.36	0.00
Indirect (Input)	3696.54	0.00	3696.54	3696.54	0.00
Capital	10640.39	0.00	10640.39	15236.89	-4596.50
Land Rent Value	7717.50	0.00	7717.50	12314.00	-4596.50
Mark Up	1377.10	0.00	1377.10	1377.10	0.00
Indirect (Input)	1545.79	0.00	1545.79	1545.79	0.00
Tradables	12036.08	6793.75	6793.75	7201.38	-407.63
Land Preparation	1987.40	1689.29	1689.29	1790.65	-101.36
Seed & Sowing Operations	2407.87	2094.85	2094.85	2220.54	-125.69
Intercultural Practices	246.96	209.92	209.92	222.51	-12.59
Irrigation (Canal)	38.04	19.02	19.02	20.16	-1.14
Irrigation (Tube Well)	660.82	495.62	495.62	525.35	-29.74
Fertilizers & FYM	2437.89	2072.21	2072.21	2196.54	-124.33
Land Revenue & Local Taxes	44.04	2.20	2.20	2.33	-0.13
Harvesting & Threshing	2289.20	114.46	114.46	121.33	-6.87
Transport & Marketing	1923.87	96.19	96.19	101.97	-5.77
Profitability			11632.96	-1154.78	12787.75
DRC	1.05				
SBC	0.96				
NPC	1.28				
EPC	1.39				
Yield (40 Kgs/Acre)	48.75	1950.00			
Wholesale Market Price of IRRI Paddy (Rs./40 Kg)	644.71				
Total Value of Irri Production at Market Price (Rs./40kg)	31429.76				
Value of Paddy Straw (By-Product)	4651.00				
Gross Value of Production	36080.76	36080.76			
Export Parity Price of Paddy at Farm Level (Rs./40Kg)	547.60				
Total Value at Export Parity Price	26695.45				

FEP* = Foreign Exchange Premium

Table B.7: PAM Budget for the IRRI Paddy Harvesting Year 2017–2018 for Punjab
(Export Promotion Regime) Rs/Acre

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 6% Tradable	Transfer
Product & Byproducts	40872.50	40872.50	40872.50		
Export Parity (2017-18)	31407.50	31407.50	31407.50	33291.95	7580.55
Labor	11120.63	0.00	11120.63	11120.63	0.00
Management	1563.00	0.00	1563.00	1563.00	0.00
Labor for Bund Making	517.50	0.00	517.50	517.50	0.00
Manual Weeding	535.20	0.00	535.20	535.20	0.00
Labor for Irrigation and Water Course Cleaning	2683.80	0.00	2683.80	2683.80	0.00
Indirect (Input)	5821.13	0.00	5821.13	5821.13	0.00
Capital	15062.91	0.00	15062.91	16062.91	-1000.00
Land Rent Value	11500.00	0.00	11500.00	12500.00	-1000.00
Mark Up	1484.30	0.00	1484.30	1484.30	0.00
Indirect (Input)	2078.61	0.00	2078.61	2078.61	0.00
Tradables	22559.20	14659.47	14659.47	15539.04	-879.57
Land Preparation	3962.00	3367.70	3367.70	3569.76	-202.06
Seed & Sowing Operation	4583.10	3987.30	3987.30	4226.53	-239.24
Intercultural Practices	702.40	597.04	597.04	632.86	-35.82
Irrigation (Canal)	95.70	47.85	47.85	50.72	-2.87
Irrigation (Tube Well)	3369.80	2527.35	2527.35	2678.99	-151.64
Fertilizers & FYM	4549.90	3867.42	3867.42	4099.46	-232.04
Land Revenue & Local Taxes	71.00	3.55	3.55	3.76	-0.21
Harvesting & Threshing	2800.00	140.00	140.00	148.40	-8.40
Transport & Marketing	2425.30	121.27	121.27	128.54	-7.28
Profitability			29.50	-9430.62	9460.12
DRC	1.53				
SBC	0.78				
NPC	1.23				
EPC	1.48				
Yield (40 Kg/Acre)	42.50				
Wholesale Market Price Of IRRI Paddy (Rs./40 Kg)	797.00				
Total Value of Production at Market Price (Rs./40kg)	33872.50				
Value of Paddy Straw (By-Product)	7000.00				
Gross Value of Production	40872.50				
Export Parity Price of Paddy at Farm Level (Rs./40Kg)	739.00				
Total Value At Export Parity Price	31407.50				

FEP* = Foreign Exchange Premium

Table B.8: PAM Budget for the IRRI Paddy Harvesting Year 2017-18 for Sindh

Item	Total Value	Percent Tradable	Market Value	Opportunity Cost Value FEP* 6% Tradable	Transfer
Product & Byproducts	55390.00	55390.00	55390.00		
<i>Export Parity (2017-2018)</i>	40645.00	40645.00	40645.00	43083.70	12306.30
Labor	11252.03	0.00	11252.03	11252.03	0.00
Management	1563.00	0.00	1563.00	1563.00	0.00
Labor for Bund Making	800.00	0.00	800.00	800.00	0.00
Manual Weeding	974.00	0.00	974.00	974.00	0.00
Labor for Irrigation & Water Course Cleaning	2238.00	0.00	2238.00	2238.00	0.00
Indirect (Input)	5677.03	0.00	5677.03	5677.03	0.00
Capital	13681.00	0.00	13681.00	16181.00	-2500.00
Land Rent Value	10000.00	0.00	10000.00	12500.00	-2500.00
Mark Up	1269.90	0.00	1269.90	1269.90	0.00
Indirect (Input)	2411.10	0.00	2411.10	2411.10	0.00
Tradables	21030.70	12942.57	12942.57	13719.12	-776.55
Land Preparation	5163.00	4388.55	4388.55	4651.86	-263.31
Seed & Sowing Operation	4500.00	3915.00	3915.00	4149.90	-234.90
Intercultural Practices	378.80	321.98	321.98	341.30	-19.32
Irrigation (Canal)	95.70	47.85	47.85	50.72	-2.87
Irrigation (Tube Well)	391.50	293.63	293.63	311.24	-17.62
Fertilizers & FYM	4313.10	3666.14	3666.14	3886.10	-219.97
Land Revenue & Local Taxes	55.00	2.75	2.75	2.92	-0.17
Harvesting & Threshing	3200.00	160.00	160.00	169.60	-9.60
Transport & Marketing	2933.60	146.68	146.68	155.48	-8.80
Profitability			17514.40	1931.55	15582.85
DRC	0.93				
SBC	1.05				
NPC	1.29				
EPC	1.45				
Yield (40 Kg/Acre)	55.00				
Wholesale Market Price of IRRI Paddy (Rs./40 Kg)	898.00				
Total Value of Production at Market Price (Rs./40kg)	49390.00				
Value of Paddy Straw (By-Product)	6000.00				
Gross Value of Output	55390.00				
Export Parity Price of Paddy at Farm Level (Rs./40Kg)	739.00				
Total Value at Export Parity Price	40645.00				

(Export Promotion Regime) Rs/Acre
FEP* = Foreign Exchange Premium