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Pakistan Instittute of Development Economics Islamabad Pakistan

2008

COST BENEFIT ANALYSIS OF DIFFERENT RICE VARIETIES IN DISTRICT SWAT

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ABSTRACT

The study was conducted in district Swat during 2007 to make comparative cost benefit analysis of per acre rice production of different rice varieties. Primary data was collected through structured questionnaire. Five villages from three tehsils namely Kabal, Barikot and Matta were randomly selected. A sample size of 100 farmers was used and the respondents were randomly selected. For comparison, Cost-Benefit Analysis approach was used. The total per acre rice production of these varieties was amounted to Rs. 40000, 52500, 33600, 34000, 30400, 30400 and 68750 respectively. The same average cost amounted to Rs. 13565 was observed for all the varieties. The Benefit Cost Ratio (BCR) of variety JP-5, Basmati-385, Sara Saila, Dil Rosh-97, Swat-1 and Swat-2 and Fakhr-e-Malakand was 2.24, 3.20, 1.80, 1.80, 1.46, 1.54 and 4.36. The highest BCR value is observed for variety Fakhr-e-Malakand indicted the most profitable variety in terms of net production. Awareness about the cultivation of Fakhr-e-Malakand variety should be given as against the growing traditional varieties in district Swat.
Key Words: Comparison, Costs, Revenue, Rice Varieties, Swat

INTRODUCTION

Rice is the staple food for the world 2.7 billion populations mostly resides in Asia. Asia produces and consumes 90% of the world rice. (Said *et al.,* 2003). Pakistan is an agricultural country blessed with a climate favorable for rice production i.e. fertile soil, vast irrigated land and considerable manpower. Agriculture is an important source of national income, employment, foreign exchange earnings, food supply and industrial raw materials in the country. Agricultural sector is the main stay of the local community of district Swat and most of population is related either directly or indirectly with it. The economy of the district is predominantly agriculture-based. Rice occupies a pivotal place in Swat's domestic food and livelihood security system. Rice has become particularly important in the diets of the poor community. It is grown under diverse soil and climatic conditions in the District Swat. JP-5, Basmati-385 and Sara

Saila are the most popular varieties of the district. However, the varieties like Swat-1, Swat-2, Dil Rosh-97, Pakhal and Kashmir Basmati were also found that were grown in the district. It is well known fact that varieties differ from each other in term of costs, revenues and net production. Santha, 1993, studied the economics of rice cultivation and carried out comparative analysis of production cost, input use and profitability of rice production. The Viruppu crop performed best in terms of benefit cost ratio and cost of production. Gubbaiah and Kuberappa, 1993, made comparative analysis in terms of net production of two resistant rice varieties (IET-8111) with the susceptible variety Jaya. Dash, *et al.* 1995 studied per hectare cost and return and level of input used in production for summer rice. It was observed that on average, per hectare cost of cultivation was Rs. 17113. The average yield per hectare was about 56 quintals, which varied from 52.71 quintals to 58 quintals on the sample farms. The average gross and net returns per hectare were Rs. 18923 and Rs. 1920 respectively. Gangwar and Dubey, 1996, compared 10 different rice-based cropping systems. Maximum net return/hectare were obtained by rice/rice/black gram *[Vina mungo]*,rice/rice/sesame and rice/rice/green gram *[Vigna radiate]* sequences. Reddy, 1996, assessed the performance in terms of yield per hectare, unit cost and total factor productivity.

The analysis revealved that relatively lower prices for modern inputs compared to traditional inputs and thereby obtained higher yields at lower costs. Similarly, Upendra, 1996, studied thet per hectare net return was comparatively higher in an irrigated rice ecosystem (Rs. 3270.13) followed by rain fed upland rice (Rs. 1424.42), rain fed lowland rice (Rs 521.56) and deep water (Rs 471.35). The average per ton cost of production of rice was Rs. 1898.2, Rs. 2266.6, Rs. 1601.1 and Rs. 2202.5 under rainfed upland, rainfed lowland, irrigated and deep-water

situation respectively. Haq, *et al.*, 2002, used Cobb-Douglas type of production function technique to find out the contribution of each input towards output. He investigated the relationship of farm size and input use and its effect on production and gross and net incomes of potato. Labor, seed, farmyard manure, nitrophos and labor were the factors significantly contributed towards output. The Cobb-Douglas functional form is selected as the function to use because of its reasonable theoretical assumptions, good record, simplicity of form and the limited degrees of freedom available (Fuss, *et al.* 1978).

The present study has been designed to compare cost and revenue of different varieties, using benefit cost ratio technique. The study will be helpful for farmers and agriculture economists in terms of knowing about the cost and revenue parameters in district Swat.

MATERIALS AND METHODS

The study was carried out in the Swat district during 2007. Three tehsils of district Swat (Kabal, Barikot and Matta) were selected for the relevant information. Five villages from each Tehsil were randomly selected and a sample of size one hundred farmers was used. The farmers were also selected randomly. Primary data was personally collected from the respondents through structured questionnaire. The data about different varieties of rice and their costs and revenues were collected in the farmer's fields, homes or in community centers (Hujras). Benefit Cost Ratios of different rice varieties has been calculated for finding the most profitable rice variety in terms of total and net revenue. More specifically the Benefit Cost Ratio (BCR) for each variety was:

BCR = VNR / TC

Where, VNR = Variety net revenue and TC = Total cost of the variety
More and more the value of Benefit Cost Ratio more will be the net return.
Furthermore, basic arithmetics, averages, classification and tabulation were used for the analysis.

RESULTS AND DISCUSSION

The major rice varieties grown in district Swat were JP-5, Basmati-385, Sara Saila, Dil Rosh-97, Swat-1, Swat-2 and Fakhr-e-Malakand. The same average cost was observed for all the varieties valued at market price amounted to Rs. 13565 as given in Table I. The major costs items were land preparation, raising nursery, fertilizers, transplanting, irrigation, insecticides, harvesting, threshing, cleaning and land rent.

Table I. *Average per acre cost and revenue for all varieties*

Particulars	Unit	Quantity	Rates (Rs.)	Amount/ acre(Rs.)
Land preparation				
i) Ploughing with tractor	Hr	3	200	600
ii) Puddling with bullocks	Day	1	500	500
Raising nursery				
i) Seed	Kg	30	15	450
ii) Nursery bed preparation	Day	2	120	240
iii) Nursery maintenance	Day	1	120	120
iv) Nursery pulling, transport	Day	4	120	480
Fertilizers				
i) DAP	Kg	25	9	225
ii) Urea	Kg	50	8.6	430
Transplanting	Day	10	120	1200
Irrigation	Day	4	120	480
Insecticides	--	--	--	600
Harvesting	Day	10	120	1200
Threshing (with tractor)	Hr	1	300	300
Cleaning/handling	Day	7	120	840
Land rent	--	--	--	5300
Total Cost				**13565**

Source: Field survey

Average total production and average net production for all varieties were amounted to Rs. 45378 and Rs. 31813 respectively as given in Table II. The average revenue from rice straw from one acre of rice area for all varieties was amounted to Rs. 4000 (Table II).

Table II. *Average net production for all varieties*

Type of yield	Quantity (mds)	Rate / md (Rs.)	Total amount/acre (Rs.)
i) Paddy	42.14	964.29/md	41378.57
ii) Straw	--	4000(lump sum)	4000
Total production	--	--	45378.57
Net production	--	--	31813.57

Source: Field survey

According to Table III, the total per acre rice production of varieties JP-5, Basmati-385, Sara Saila, Dil Rosh-97, Swat-1, Swat-2 and Fakhr-e-Malakand were amounted to Rs. 40000, 52500, 33600, 34000, 30400, 30400 and 68750, respectively. The rice straw was valued at Rs. 4000, 4500, 4500, 4000, 3000, 4000 and 4000, respectively. The per acre net productions were observed as Rs. 30435, 43435, 24535, 24435, 19835, 20835 and 59185, respectively. Fakhr-e-Malakand gave a high yield i.e. Rs. 72750 compared to all other varieties. The component of rice straw shows better share out of the total production. The total production (excluding rice straw) for varieties JP-5, Basmati-385, Sara Saila, Dil Rosh-97, Swat-1, Swat-2 and Fakhr-e-Malakand were Rs. 36000, 48000, 29100, 30000, 27400, 26400 and 64750, respectively. The value of net productions (excluding irrigation cost) was Rs. 29955, 42955, 24055, 23955, 19355, 20355 and 58705, respectively. Still there is a need to grow improved varieties like Fakhr-e-Malakand in the target area.

Table III. *Total and net production of different varieties*

Total and net production of variety JP-5			
Type of yield	Quantity (mds)	Rate / md (Rs.)	Total amount/acre (Rs.)
i) Paddy	40	1000/md	40000
ii) Straw	--	4000 (lump sum)	4000
Total production	--	--	44000
Net production	--	--	30435
Total net production of variety Basmati-385			
i) Paddy	42	1250/md	52500
ii) Straw	--	4500(lump sum)	4500
Total production	--	--	57000
Net production	--	--	43435
Total net production of variety Sara Saila			
i) Paddy	42	800/md	33600
ii) Straw	--	4500/(lump sum)	4500
Total production	--	--	38100
Net production	--	--	24535
Total net production of variety Dil Rosh-97			
i) Paddy	40	850/md	34000
ii) Straw	--	4000/(lump sum)	4000
Total production	--	--	38000
Net production	--	--	24435
Total net production of variety Swat-1			
i) Paddy	38	800/md	30400
ii) Straw	--	3000(lump sum)	3000
Total production	--	--	33400
Net production	--	--	19835
Total net production of variety Swat-2			
i) Paddy	38	800/md	30400
ii) Straw	--	4000(lump sum)	3000
Total production	--	--	33400
Net production	--	--	20835

Total net production of variety Fakhr-e-Malakand			
i) Paddy	55	1250/md	68750
ii) Straw	--	4000(lump sum)	4000
Total production	--	--	72750
Net production	--	--	59185

The Benefit Cost Ratios (BCRs) of variety JP-5, Basmati-385, Sara Saila, Dil Rosh-97, Swat-1 and Swat-2 and Fakhr-e-Malakand is 2.24, 3.20, 1.80, 1.80, 1.46, 1.54 and 4.36, as given in table IV. The highest BCR value is observed for variety Fakhr-e-Malakand indicting the most profitable variety of the district.

Table IV. *Benefit cost ratios for different varieties*

Variety name	Variety net benefit	Total cost	Benefit cost ratios
JP-5	30435	13565	2.24
Basmati-385	43435	13565	3.20
Sara Saila	24535	13565	1.80
Dil Rosh-97	24435	13565	1.80
Swat-1	19835	13565	1.46
Swat-2	20835	13565	1.54
Fakhr-e-Malakand	59185	13565	4.36

Source: Field survey

CONCLUSION AND RECOMMENDATIONS

Having compared total costs, total production and total net production of one acre of rice area, Fakhr-e-Malakand was observed the most profitable variety of the district. Awareness about the cultivation of profitable varieties like Fakhr-e-Malakand should be created. Choice of variety should depend on environment, planting date, quality, marketing and harvest scheduling rather traditional methods. The government should also arrange extension services programs for this purpose.

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