

Economic Assessment of Hybrid Paddy Producers in Udham Singh Nagar District of Uttarakhand

Shivam Arora¹, Ashutosh Singh², Shweta Chaudhary³, Kiran Rana⁴ and Ajay Kumar Tripathi⁵

^{3,5} Assistant Professor, Department of Agricultural Economics, College of Agriculture

⁴ Assistant Professor, Department of Agricultural Communication, College of Agriculture

² Professor, ¹ MBA Student, College of Agri. Business Management

Govind Ballabh Pant University of Agriculture & Technology, Pantnagar

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ABSTRACT

A study was conducted to evaluate hybrid paddy cultivation in Udham Singh Nagar district of Uttarakhand. A three stage sampling technique was employed for constructing sampling plan of the study. Probability Proportion to size method technique was followed to select respondent which make a sample size of 60 farmers comprising of 28 small, 17 medium and 15 large farmers selected from 4 villages. CACP concept was applied to work out cost of cultivation and returns of hybrid paddy of sample farms. The net returns were estimated Rs. 26420.00/ha, Rs. 26775.00/ha, Rs. 32133.00/ha for small, medium and large farm size groups, respectively in the study area. However major production constraints faced by sample farmers were high incidence of pest and diseases, low output price during harvesting, high output price fluctuation, inadequate availability of fertilizer. The nature and dimension of these problems were found varying across different size group of farms. High cost of hybrid seeds was restricting farmers from adopting hybrid rice technologies. Thus the subsidy should be provisioned on seeds of hybrid rice for its popularization among the rice growers. There is a need to follow a strong extension program in the area regarding improved cultivation practices of hybrid rice. Production constraints are discouraging the growers to augment the production of hybrid rice. Efforts should be made for vital inputs particularly seeds, fertilizers and pesticides at reasonable prices and in adequate quantities to the farmers at required time. In this context, strengthening of input delivery system in the area is urgently required. Also, less expensive and effective measures for the control of serious insect-pests and diseases should be undertaken.

Key words: Garrett's Ranking Technique, Garrett Score, Multi stage sampling, CACP Concept.

INTRODUCTION

Agriculture in India is the primary occupation and is one of the strong holds of Indian economy and accounts for 17.3 percent of country's GDP in 2016-2017 (economic survey

2016-17)¹. India is the 2nd largest producer of paddy in the world next to China. Agricultural progress is normally regarded as a pre-requisite of economic development.

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The green revolution has helped, to a great extent, achieve self-sufficiency in food grains and improve the productivity of resources in agriculture. The new technology raised the profitability of investment. This encouraged the farmers to make sizable investment in agriculture and farming is considered as business in the recent years. In our country, majority of the farming community belongs to marginal and small farmers 76.20 percent who have only 29.00 percent of the total operational holding, while 71.00 percent of the operated area is possessed by farmers who have medium and large size holdings. The food, fodder and fuel production will have to be increased by 60.00 percent in the next 25 years to meet the needs of the growing population. It is projected that by 2025 the country's population will be nearly 1.40 billion requiring annually 380.00 million tons of food grain. Agriculture throughout the world is the main source of livelihood for over 50.00 percent of population and contributes roughly the same proportion to the national income². Rice is one of the largest traded commodities in the world with a production reaching 16.40 million tones. India ranked first in area under paddy, (43.66 million ha) and second in terms of production (93.36 million tons) during 2013-14 and stood next only to China in the world. But the yield levels in India were low, compared to other major rice producing countries, viz., Egypt (9731 kg per ha), China (6556 kg per ha) and India (2239 kg per ha). In hill agriculture, rice is major food crop and grown in an area of 54% of total area of cereal *i.e.* 2.94 lakh hectares respectively. Production of rice is 5.50 million out of which plains and hills constitute about 3.72 (67.60%). Average productivity of rice in the state is around 20.50 qtl per ha³. Farmers in developing country fails to exploit full potential of agriculture technologies and make allocative errors with this yield show wider variation which is usually reflecting a corresponding variation in the management capacity of the farmers. This shows that huge untapped potential still exists for raising productivity and income of the

farmers by improving factors efficiency⁴. The scope for expansion of area under rice has already been exhausted, the only way to increase the production by increasing the productivity of rice through modern technology. The hybrid rice may be potential technology to increase the average productivity level of rice in the country⁵.

Uttarakhand state is consisting of 13 districts which are spreads over plains, terrain, mountain and alpine zones. Out of 13 districts of the State only Udham Singh Nagar, Haridwar, Dehradun and some area of Nainital district are famous for food grain production. Out of these districts U S Nagar having largest area under paddy cultivation accounting for 1,06,740 ha with 3,16,652 tones production, and 2967 kg per ha productivity. It is generally believed that farmers in developing agriculture fail to exploit fully the potential of technologies and make allocative errors as a result yields show wider variation. This shows that considerable scope exists for raising productivity and income of the farmers by improving their efficiency. Thus various factors responsible for inefficiencies need to be identified and addressed properly for achieving a higher production in paddy and thus improving farmers income.

PROBLEM STATEMENT

Rice is an important food crop which contributes nearly 39.00 percent to total food grain production in India. The population of our country has increased around 18 crores but production of paddy increased by around 10 million tones in last decade. The level of paddy production may not be sufficient to feed the ever increasing population in the future. The scope for expansion of area under paddy has already been exhausted, the only way to increase the production is by increasing the productivity of paddy through frontier technologies. The hybrid rice may be potential technology to increase the average productivity level of rice in the country. Hybrid rice has potential to 20-30 percent higher production than the inbred rice within same maturity duration as reported in previous studies. But farmers could not be able to

realize higher yield of hybrid rice due to poor management practices, incidence of pest and diseases etc. For hybrid rice technology, resource use efficiency varies from farmer to farmer due to variation in access to inputs and technology. Hybrid rice production to be a remunerative enterprise farmer should be able to get considerable net profit over cost and thus it is the farmers major concern to ensure satisfactory margin over cost of various inputs and selling price of product. Therefore, it becomes essential for the farmers to have knowledge about the production costs. Hence an in depth analysis is required to find economic profitability and the various ways to improve the resource use efficiency of hybrid rice production by analyzing various constraints in production of hybrid rice.

OBJECTIVES

In the light of the above researchable questions the study has been designed with the following specific objectives.

1. To estimate the costs of and returns from hybrid paddy production on different size groups of farms.
2. To examine the constraints faced by farmers in hybrid paddy production.

Sampling: Both primary and secondary data was collected to accomplish this study. Three stage sampling technique was employed for the study purpose. In the first stage two blocks were selected which were having the maximum area under hybrid paddy cultivation. Then two villages were selected from each block having maximum acreage under hybrid

paddy. Further a list of farmers was prepared based on complete enumeration among the selected villages from both the blocks. Then the farmers were classified into three categories and a sample of 60 farmers were obtained from these four villages on the basis of probability proportion to size.

Analytical Procedure:

1. Costs and returns was estimated by using cost concepts as adopted by the Commission for Agricultural Costs and Prices (CACP)⁴
2. Production constraints in hybrid paddy were ranked using Garret's ranking technique as follows:

$$\text{Percent position} = 100 * (R_{ij} - 0.5) / N_j$$

Where, R_{ij} = Rank given for i^{th} constraints by j^{th} individual,

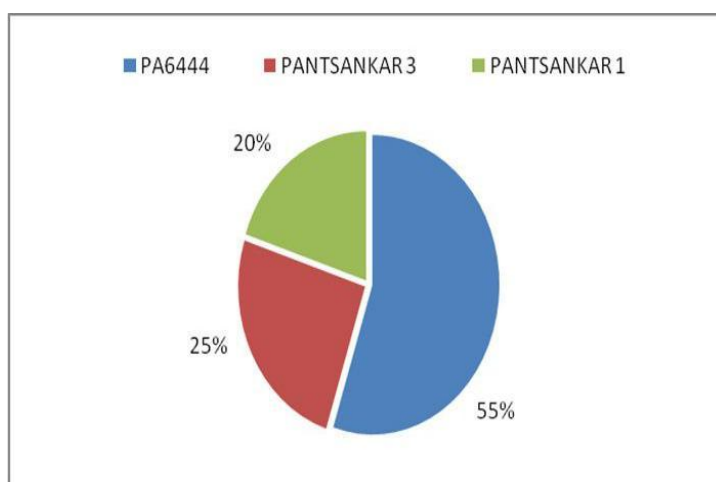
N_j = Number of constraints ranked by j^{th} individual.

Duration of Study: Research was conducted for a span of two months i.e. from 11th March 2017 to 11th May 2017.

RESULTS

Cost and return from hybrid paddy variety

In hybrids, PA6444 was the most popular on sample farms followed by Pant sanker1, Pant sanker3. PA6444 was grown by 55 percent farmers on sample farms with a yield range 60-65 qtl per ha .Whereas 25 percent farmer's cultivated Pant sanker3 followed by Pant sanker1 with 20percent in their farms with a yield range of 60-65 qtl per ha as indicated in Figure 1.



Farmers gave different weightage to different resources for making production decisions. While calculating the profitability of any crop, the consideration of costs is taken differently by different farmers. Some farmers are interested to know the returns over direct costs involved in the crop cultivation while the others are interested in considering the indirect

costs as well such as imputed value of owned labour. Therefore, it was considered worthwhile to work out the net returns over various cost concepts viz., cost A1, A2, B1, B2, C1, C2 and C3. Table 1 indicates costs involved in the cultivation of hybrid paddy cultivation.

Table 1: Cost of Hybrid paddy cultivation (Rs/ha)

Sl. No	Particulars	Operational cost	Hybrid paddy producers			
	Material cost		Small	Medium	Large	Over all
1.	Nursery establishment		450.00	300.00	300.00	350.00
2.	Transplanting		3190.00	5075.00	6400.00	5500.00
3.	Fertilizer application		300.00	1000.00	500.00	600.00
4.	Weeding		1200.00	1800.00	3000.00	2000.00
5.	Irrigation		500.00	800.00	1200.00	830.00
6.	Plant protection chemical		300.00	1000.00	1500.00	930.00
7.	Total pre –harvest labour		5940.00	9900.00	13200.00	10130.00
8.	Harvesting		1900.00	4000.00	4700.00	3100.00
	Total cost		7840.00	14000.00	17900.00	13246.00
	Material cost					
1.	Tractor power		5110.00	5511.00	8616.00	6412.00
2.	Seeds		2650.00	2720.00	2800.00	2723.00
3.	Irrigation		700.00	800.00	934.00	811.00
4.	Plant protection chemicals		1010.00	1120.00	1200.00	1110.00
5.	Fertilizer					
	Urea		1000.00	1070.00	1300	1023
	DAP		1660.00	1595.00	1630	1622
	MOP		650.00	658.80	737	764
	Zn		520.00	611.00	643	594
	Total cost of fertilizer		3730.00	3935.00	4350.00	4005.00
	Sub total		13200.00	14086.00	17900.00	15063.00
	Other cost					
	Miscellaneous expenses		20690.00	21288.00	21752.00	21243.00
	Grand total		41730.00	46425.00	50742.00	46301.00

Operational cost: Labour is essential for transplanting, weeding, sowing, fertilizer application, spraying etc. Due to scarcity of labour in peak period the wages of labour was varied for different operations for this reason the expenditure incurred on hired labour was high enough. Farmers growing paddy under hybrid on small, medium and large farmers incurred around Rs. 7840.00, 14090 and 17900.00 per ha on human labour.

Material cost: The expenditure made on material for paddy cultivation such as, tractor power, seeds, irrigation, plant protection chemical, and fertilizer constitutes the component of material cost. It was observed from the table 1 that material cost incurred in

the cultivation of paddy was estimated to be Rs. 15063.00 per ha on hybrid paddy growing farmers, respectively.

Other cost: The third component of the cost of paddy cultivation was other costs. Other cost consisted of depreciation on the farm assets used in the cultivation of paddy crop etc. The rental value of land was an important item of other cost, which was estimated to be Rs. 16000.00 per ha for paddy for across the all size of farms and locations. The depreciation charges were estimated to be Rs 1560, 1655 and 1485 per ha was estimated for the farmers using hybrid paddy.

Net return from hybrid paddy cultivation on sample farms (Rs /ha): The returns from paddy cultivation using hybrid paddy and returns over various costs have been presented in the (table 2) The table reveals that the yield of paddy on farms using hybrid was 61.33 qtls per ha on farms having the gross return of Rs.78640.00. It is clear from the table 2 that on

a small and medium hybrid paddy growing farmers were getting a net income of Rs 26,597.5 per ha(average value) over total cost whereas farmers growing hybrid paddy variety in larger area were getting a net income of Rs 32133.00 per ha. From above analysis, it can be concluded that hybrid paddy cultivation is more profitable in larger land area.



Table 2: Returns from hybrid paddy cultivation on sample farms

Particulars	Small	Medium	Large	Over all (approx)
Yield of Main product (qtl / ha)	58.00	61.00	65.00	61.00
Avg Price of main product (Rs./qtl)	1175.00	1200.00	1275.00	1216.00
Return from main product (Rs. / ha)	68150.00	73200.00	82875.00	74176.00
Net Return (Rs. / ha) over				
Net Return (Rs/ ha)	26420.00	26775.00	32133.00	27875.00

Constraint faced by farmers in production of hybrid paddy:

Garrett's Ranking Technique was used to analyse the constraints faced by hybrid paddy growers. The major constraints faced by small, medium as well as large farmers has been presented in (Table 3). Major constraint

faced by the small and medium farmers were high cost of seeds followed by inadequate availability of fertilizers and unavailability of quality pesticides. In case of large farmer high cost of seeds, high incidence of pest and disease and high output price fluctuations were identified as the major constraints.

Table 3: Ranking of various constraints faced by small medium and large farmers in production of hybrid paddy

Sl. No.	Constraints	Rank			Overall
		Small	Medium	Large	
1	Unavailability of quality pesticides	5(48)	3(59)	5(51)	4(53)
2	Inadequate irrigation facilities	9(30)	10(28)	10(27)	10(29)
3	High cost of seeds	1(75)	1(76)	1(74)	1(75)
4	Low output price during harvesting	6(47)	7(43)	6(46)	5(45)
5	Inadequate availability of fertilizers	4(57)	2(62)	4(53)	3(56)
6	Weed infestation	8(37)	9(38)	8(41)	8(39)
7	High output price fluctuations	3(62)	8(41)	3(55)	6(50)
8	High incidence of pest and disease	2(69)	4(56)	2(66)	2(63)
9	Inadequate availability of labour	10(23)	5(50)	9(37)	9(35)
10	Untimely rains	7(46)	6(45)	7(42)	7(43)

Note: Figures in parentheses indicates average score

RECOMMENDATIONS FOR ACTION

1. There is a need to follow a strong extension programme in the area regarding improved cultivation practices of hybrid rice.
2. Subsidy should be provisioned on seeds of hybrid rice for its popularization among the rice growers.
3. There is need to evolve a package of practices of crop operations based on mechanical techniques to reduce dependence on human labour and to reduce unit cost of seed production.
4. The required inputs for hybrid paddy seed cultivation need to be supplied to the farmers by a contract firm on credit basis.
5. Exploration of the Product: To make a product available to the final consumer i.e. farmer, a well-structured distribution network has to be followed. To achieve this companies, need to make the product available with at least 5-7 retailers in each

area (market cluster depending upon the no of villages served by the retailer.)

6. Motivation: Since 30% of the farmers purchase seeds on the advice of the retailers it is important for the hybrid paddy seeds companies to motivate the retailers to push their product into the market.

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