

# Profitability of Paddy Production Under Irrigated Ecology Across North Eastern Ghat Agro climatic Zone of Odisha

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## ABSTRACT

Odisha is the ninth largest state in India with a share of 4.7% of India's total landmass and eleventh largest in terms of population, comprising 3.47% of India's total population and has a geographical area of 1,55,707 sq. kms and is divided into 10 Agro-Climatic Zones. Out of the 10 ACZs, ACZ -5 (North Eastern Ghat) covers 15% of the total area of the state. Paddy is the major crop grown in this agroclimatic zone. This study was carried out to explore the cost and returns of Paddy cultivation under rainfed condition in NEG ACZ in 2018-19. Multi stage purposive cum random sampling technique was employed in the selection of 60 farmers for the study. The study showed that cost structure for irrigated Paddy was Rs. 48961.51. Yield was higher in irrigated (45.15 q/ha) situation. Per hectare gross returns was Rs. 75,349.8. Among the different items of costs, human labour was the highest (43.58 per cent). The other important items of cost were machine labour (16.13 per cent), fertilizer (6.73 per cent) followed by rental value of own land (6.40 per cent), interest on fixed capital (5.83 per cent) and interest on working capital (4.19 per cent). The analysis of net return from Paddy cultivation revealed that the net return per hectare was Rs. 2,6388.29. And at the last the rate of return per rupee of expenditure was found higher i.e 1.53 in case of irrigated condition. Cultivation of Paddy is profitable in irrigated situation across North eastern ghat Agro climatic Zone.

*Key words:* Cost and net returns, Irrigated situation, North Eastern Ghat Agro climatic Zone

## Introduction

Agriculture, the primary sector of the economy has continued to serve as the lifeline and it remains the main pillar of Indian Economy. About 54.6 per cent of the total workforce in the country and 83.3 per cent in Odisha are still engaged in agricultural and allied sector activities, which accounts for approximately 17.8 per cent of the country's and 21.27 per cent of the state's Gross Value Added (GVA) for the year 2020-21. Odisha is the ninth largest state in India with a share of 4.7% of India's total landmass and eleventh largest in terms of population, com-

prising 3.47% of India's total population and has a geographical area of 1,55,707 sq. kms and is divided into 10 Agro-Climatic Zones on the basis of soil structure, humidity, elevation, topography, vegetation, rainfall and other Agro- Climatic factors. Out of the 10 ACZs, ACZ -5(North Eastern Ghat) covers 15% of the total area of the state. With bountiful of natural resources like fertile soil, organic rich climate and rich heritage, NEG ACZ of Odisha is one of the most fascinating areas of the state. The North Eastern Ghats region of Odisha spread over Kandhamal, Gajapati, Rayagada, parts of Ganjam and small patches of Koraput which endowed with

potentially rich natural resources at the same time are subjected to inherent problems like undulating topography, fragile steep slopes, shifting cultivation, large scale deforestation, intense rainfall, heavy runoff, low productivity, dominance of low value crops, inefficient resource use and severe soil erosion leading to continuous land degradation. Rice is the major cereal crop accounting 37.90% of the total cropped area in the zone under different ecology. The farmers of Rayagada and Kandhamal district mainly growing upland rice in drought prone areas and the short duration variety like Khandagiri, Parijata, Anjali, Sahabhadhan are grown. In Ganjam district where assured irrigation is there summer rice is also an option for the farming community.

Agriculture is the life blood of the economy of the concerned zone. As it plays an important role in the economy, so cost of cultivation and return information is very much crucial for the farmer to know the status of crop, as well as it helps for price policy formulation. The major aim of conducting profitability analysis of Paddy is to reach the production capacity that will generate profit in terms of profit margin. In this context, this study aims to assess the profitability in production of major crop i.e Paddy in the concerned ACZ.

### Sampling technique

North eastern ghat agro climatic zone was selected from the state of Odisha and out of the five districts coming under north eastern ghat agroclimatic zone, Ganjam district was taken for the study as it is coming under the irrigated ecology. A multi stage purposive cum random sampling method was used to collect the data. From Ganjam districts, Jaganathprasad and Digapahandi blocks were selected as per the gross irrigated area. Then from each block 30 farmers were selected making the sample size to 60. Both primary and secondary data were collected and used for the proposed study.

### Methodology

For analysing the profitability of Paddy production the budgeting technique was used. In which variable cost and fixed costs are computed and the net income was calculated to get the B:C ratio.

### Cost concept

The cost incurred are of two types variable cost and fixed cost and variable cost includes input cost, cost

of labour, interest on working capital and other miscellaneous cost. And fixed cost include Depreciation, land revenue, Interest on fixed capital and rental value of own land

### Returns

Gross return refers to the gross value of main product and by product imputed on the basis of post-harvest prices prevailing in the selected study area and net return was computed by subtracting the gross returns from total cost of cultivation. Net returns per rupee of cost were calculated by dividing net returns by total cost of cultivation.

### Results

Paddy is the major cereal crop grown in the zone in two distinct season, i.e. kharif and rabi. And the total paddy area accounted 42.65% to the total cropped area of Ganjam district. The cropping pattern of the district was analysed from 2000-01 to 2018-19. And it was revealed that Paddy is the major cereal crop for last 18 years. And there was a declining trend in area due to crop diversification.

As the zone includes both irrigated and rainfed ecology. This study attempts to calculate Returns per rupee of expenditure in irrigated ecology to know whether growing the major crop is profitable or not. The per hectare cost of cultivation of Paddy on the sample farms during 2018-19 has been estimated and the same is represented in the Table 1, 2. It is seen from the table that, at the overall level, per hectare cost of cultivation of Paddy was worked out to Rs. 48961.51. Among the different items of costs,

**Table 1.** The cropping pattern of Ganjam district

Crop	2000-01	2018-19	Percentage Change
Paddy	48.45	42.65	-10.10
Maize	1.56	3.56	133.37
Ragi	8.28	3.36	-58.46
Other Cereals	0.50	0.90	82.69
Mung	14.13	19.65	41.95
Biri	7.23	5.85	-17.32
Other Pulses	5.40	9.02	70.34
Total Oilseed	7.64	7.34	-1.94
Total Vegetable	3.92	5.56	44.76
Total Spices	1.25	1.05	14.46
Other Crops	1.58	1.00	-35.60
Total	100	100	2.10

Source (OAS 2018-19)

human labour was the highest (43.58 per cent). The other important items of cost were machine labour (16.13 per cent), fertilizer (6.73 per cent) followed by rental value of own land (6.40 per cent), interest on fixed capital (5.83 per cent) and interest on working capital (4.19 per cent). The cost incurred in respect of land revenue, irrigation and plant protection chemical cost were negligible in the cost of cultivation.

**Table 2.** Cost and Return Structure of Paddy Cultivation Under Irrigated Ecology Across Neg ACZ

Sl No.	Particulars	Value	Percentage to the total cost
I	Variable Cost (Rs/ha)		
	Human labour	21338.59	43.58
	Animal labour	2010.22	4.10
	Machine labour	7900	16.13
	Seed	1130.25	2.30
	Fertilizer	3297.77	6.73
	Irrigation	187.49	0.38
	Plant protection chemical	862.5	1.76
	Manure	2005.76	4.09
	Interest on working capital	2056.2	4.19
	Total Variable Cost	40788.78	83.30
II	Fixed Cost (Rs/ha)		
	Depreciation	2856.3	4.42
	Interest of fixed capital	2856.3	5.83
	Land revenue	15.63	0.03
	Rental value of own land	3134.55	6.40
	TOTAL FIXED COST	8172.73	16.69
III	Total Cost of Cultivation	48961.51	100
IV	RETURN		
	Main Product	45.14	
	Main Product Value	70449.8	
	By Product Value	4900	
	Gross Income (Rs/-)	75349.8	
	Net Income (Rs/-)	26388.29	
	Cost of Production (Rs/-)	1084.65	
V	Returns per rupee of expenditure	1.53	

The gross return includes returns from main product (grain) as well as by-product (straw) and the details was presented in the Table 2. The average grain yield obtained per hectare under irrigated situation was 45.14 quintals. Per hectare gross re-

turns was Rs. 75349.8. The results indicating that, yield was high in irrigated situation compared to rainfed situation which was mainly because of the management practices like maintaining optimum plant spacing, use of fertilizer, FYM and timely irrigation at the peak time. Irrigated paddy also fetched higher price compared to rainfed Paddy because of off season production and produce will be ready for sale during the month of February to March because of market arrivals are less in these time periods, resulting in high price for the produce. The analysis of net return from Paddy cultivation revealed that the net return per hectare was Rs. 2,6388.29. And at the last the rate of return per rupee of expenditure was found higher i.e 1.53 in case of irrigated condition. Cultivation of Paddy is profitable in irrigated situation across North eastern ghat Agroclimatic Zone.

## Conclusion

The economic performance of crop cultivation by farmers is greatly influenced by input prices. It is economical to cultivate irrigated Paddy in NEG ACZ. Per hectare cost of cultivation of Paddy was Rs. 48961.51. From which Variable costs accounted for about 83.30 per cent in Paddy cultivation. Out of the total cost of cultivation, major cost was incurred on labour (43.58%). Yield was higher in irrigated (45.15 q/ha).

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