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A Comparative economic analysis of System of Rice Intensification (SRI) and conventional practices of rice producer in Dhamtari district of Chhattisgarh state

Dronak Kumar, Naresh Kumar and Punendra Kumar

Abstract

Chhattisgarh is popularly known as – “Rice bowl of India” because maximum area is under rice cultivation during kharif and contribute major share in National rice production. It has geographical area of 13.51 million ha. of which 5.9 million hectares is under cultivation. Rice occupies an area of 3.61 million ha. with annual production 5.48 million tones & productivity of 15.17 qu/ha. It is growing area of 3.48 million hectare with a production of 6.15 million tones and productivity of 1517 kg hectare during 2014-15 and area, production and productivity reduced in the subsequent year. In Chhattisgarh rice is grown in the area of about 16.62 lakhs hectare with production of 22.27 lakhs tonnes and productivity 14.15 q/ha (in the year 2014-15) which is far below than the average national productivity (2010 kg/ha). In Chhattisgarh about 1/3rd area of paddy is under hybrid rice particular in under irrigated production system. Rice hybrid produce about 14-18 per cent higher grain yield include a more vigorous and extensive root system Now, farmers are growing rice hybrids in lowlands and banded uplands under irrigated ecosystem in C.G. and Dhamtari division in particular consequently. Among the total rice production in the State, more than 75.00 per cent of it's from rainfed and less than 25.00 per cent from irrigated areas. Due to popularity of “System of Rice Intensification” (SRI method) of paddy cultivation offers opportunities to researchers and farmers to expand their understanding of potentials already existing in the rice genome.

Keywords: Comparative, System of Rice Intensification, Benefit cost ratio, main product

Introduction

Rice (*Oryza sativa*) production in India is an important part of the National economic. The world's most important staple crop & the primary source of food for more than half of the world's population. More than 90% of world's rice is grown and consumed in Asia, where 60% of the earth's people live. India is second largest producer after China and has an area of over 45.5 million hectares and production of 105.31 million tones with productivity level of 2393 kg/ha. India is one of the world's largest producer of white rice, brown rice, accounting for 20% of all world rice production. Rice is the main kharif crop of India. During the last decade, high population growth and export oriented economics in Vietnam, more have led to a major intensification of rice production. In Vietnam, more than 60% of the total formed area is currently cultivated with rice fields, the total rice production was 35.6 million tones in 2007. Rice accounts for 35 to 75% of the calories consumed by more than 3 billion Asians & is planted to about 11% of the total world's cultivated land.

Materials and Methods**Collection of data**

The study is based on both primary and secondary data. The primary data was collected from the selected respondents with the help of pre-tested interview schedule by the personal interview method and secondary data was collected from Chhattisgarh agriculture statistics, land record office, annual districts statistics and other published and unpublished reports.

Methodology

Sampling technique Dhamtari block of Dhamtari district was purposively chosen as the study area because, it has the larger area under Hybrid Rice cultivation in the district. A multistage simple random sampling technique (SRS) was adopted to select the block, villages and the respondents, market and different farmer involved in hybrid Rice production and marketing in Dhamtari district. The details of the sampling techniques at various stages are given as under:.

Profitability concept

Gross income = (Quantity of main product X price of main product) + (Quantity of by product X price of by product.)

Net income = Gross income - Cost C₃

Family labour income = Gross income - Cost B₂

Family business income = Gross income - Cost A₁

Benefit cost ratio = Gross income/Cost C₃

$$\text{Cost of Production} = \frac{\text{Total Cost}}{\text{Main Produced (q/ha)}}$$

Results and Discussion

Cost concept

All most every day in farm organization and operation cost consideration enters. It is an important tool for measuring farm business activities. The farm management specialists have specified cost of cultivation into cost A₁, A₂, B₁, B₂ cost C₁, C₂ and C₃. These cost concepts have already been taken up in the methodology chapter. In this section efforts have been made to discuss according to (various costs concepts) cultivation of rice sample farmers and different Method-wise paddy cultivation of Traditional method and SRI method.

The table 1 and figure 1 clearly shows that on an average total cost of (cost C) Rs. 28088.63 per hectare Traditional method and SRI method 23958.26 was required to produce this crop of which comprised for the variable cost commonly known as cost A₁ and A₂ After adding interest on fixed capital to cost A₁, Rs. 22534.78 per hectare Traditional method and SRI method 23958.26 Rs the cost went up to as cost B₁ and when imputed value of land was further added it was increased up to Rs. 26374.48 per hectare Traditional method and SRI method 27797.96 Rs. Thus, the 10 per cent cost of the cost C₂ when added in this cost, it form total cost or cost C₃. Table further inferred that cost A₁ to cost C₃ decreases with the increase in size of holding. The various cost show significant difference among different Traditional method and SRI method farms in cultivation of rice on sample farm.

Table 1: Cost and returns in paddy cultivation of Traditional method and SRI method (Rs/ha)

Particulars	Traditional method	SRI method
Cost A	22534.78	23958.26
Cost B	26374.48	27797.96
Cost C	26655.51	28088.63
Gross returns	41493.58	56965.90

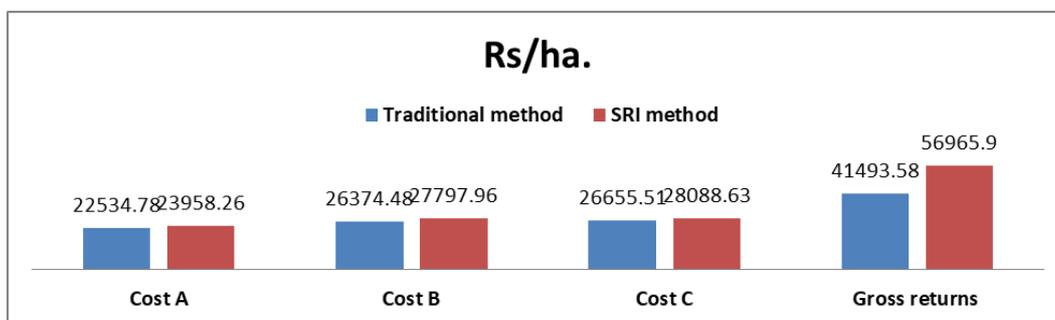


Fig 1: - Cost and returns in paddy cultivation of Traditional method and SRI (Rs/ha)

Profitability concepts

In any field of business activity profit is the prime consideration. Thus, how much a farmer earns as net income and family labour income as a producing unit and how much satisfaction he and his family derives as a consuming unit are the major deciding factor in organization and operation of farm. Hence, in this section efforts have been made to discuss the gross income, net income over operational and total cost, family labour income, and input-output ratio and cost of production of different Method-wise paddy cultivation of Traditional method and SRI method.

Table 2: Profitability of rice production on Traditional method and SRI method on sample farm (Rs/ha)

Economic Parameter	Traditional Method	SRI Method
Total cost	75564.95	79844.85
Gross income	41493.58	56965.90
Net income over		
Family labour income	15119.04	13695.62
Farm business income	18958.80	17535.32
Cost of production (Rs./qu.)	1244.89	938.24
B:C ratio	1.56	2.02

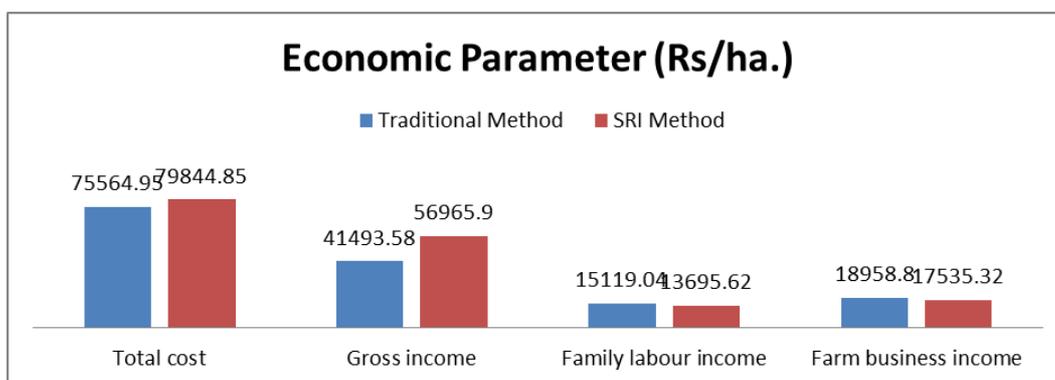


Fig 2: Profitability of rice production on Traditional method and SRI method on sample farm (Rs/ha)

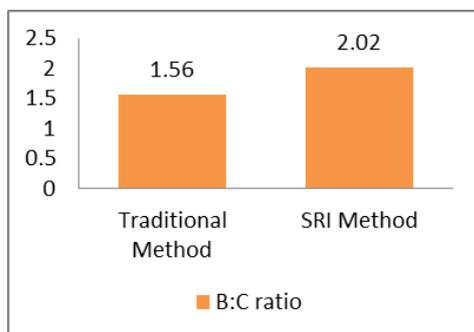


Fig 3: B.C ratio of paddy cultivation

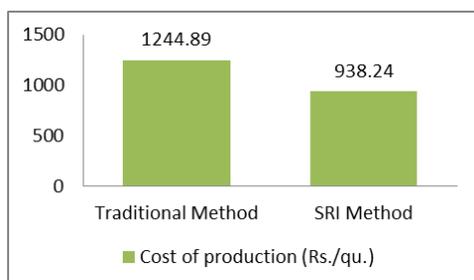


Fig 4: cost of production paddy cultivation

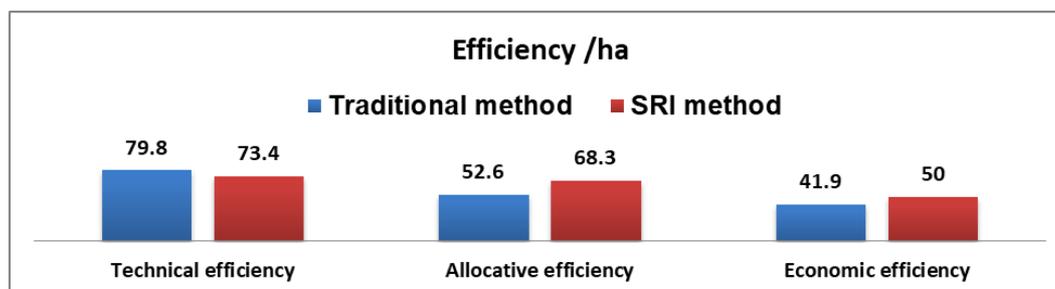


Fig 5: Technical, Allocative and Economic efficiency in traditional and SRI method of paddy.

Efficiency in Paddy Cultivation

The average allocative efficiency and economic efficiency of traditional paddy farmer sand SRI paddy farmers are presented in Table 4 and Fig 5. It could be seen from the table that allocative efficiency (52.60) of traditional paddy farmers was less than the allocative efficiency of SRI paddy farmers (68.30). In both the methods farmers were operating at less allocative efficiency than the technical efficiency. In other worlds, allocative inefficiency was higher than the technical inefficiency in both the methods of paddy production. The average economic efficiency for traditional paddy farmers and SRI paddy farmers was 41.90 and 50.00, respectively. Though the technical efficiency of SRI paddy farmers was marginally less than the technical efficiency of traditional paddy farmers, the economic efficiency was more for SRI paddy farmers comparatively because of high allocative efficiency level of SRI paddy farmers compared to that of traditional paddy farmers.

Table.4: Technical, allocative and economic efficiency in paddy (%)

S. No.	Particulars	Traditional method	SRI method
1.	Technical Efficiency	79.80	73.40
2.	Allocative Efficiency	52.60	68.30
3.	Economic Efficiency	41.90	50.00

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