

COMPARATIVE ECONOMIC ANALYSIS OF SRI (SYSTEM OF RICE INTENSIFICATION) WITH CONVENTIONAL RICE FARMING (CRF) IN KARNAL DISTRICT OF HARYANA PROVINCE, INDIA

Vinod Kumar¹, Ryuichi Yamada¹, Dinesh Kumar², Kautilya Chaudhary^{*,3} and Sanjay Kumar⁴

¹Tokyo University of Agriculture, Tokyo, Japan, ²Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, ³Asst. Scientist, Department of Agronomy, CCS Haryana Agricultural University, Hisar, ⁴ STA, CCS Haryana Agricultural University, Regional Research Station, Uchani, Karnal
Email: kautilya@hau.ac.in

Received-01.12.2020, Revised-25.12.2020

Abstract: The study was carried out to calculate the comparative economics of SRI (system of rice intensification) with conventional methods of paddy cultivation in Karnal district of Haryana province, India for the period 2018-19, on the basis of the data of costs and returns of crop. Apart from budgeting techniques, benefit-cost ratio (BCR), yield gap analysis, sustainability index and response priority index have been employed in the study. It has shown that BCR is higher for SRI (1.38) than Conventional (1.17) methods. SRI gives 14% higher yield as compared to conventional methods. Further, a decrease in seed cost significantly by 34% to that of CRF and also a decrease in water consumption significantly by 53% as compared to the Conventional method was noticed. On the basis of this study it is concluded that adoption of SRI is beneficial as compared to conventional methods for rice cultivation in Karnal district of Haryana.

Keywords: System of Rice Intensification, Conventional Rice Farming, Benefit cost ratio

INTRODUCTION

Paddy is one of the major staple foods of India. India ranks 1st in area and 2nd in production of paddy in world. Paddy contributes around 42% of total food grains production and 23% of total cropped area in India. In India, rice is a vital ingredient of household food-basket, yet its yield level is low, stationary and indeterminate (Barah, 2009). In year 2017-18 area under Paddy cultivation was 43.79 million ha with production around 112.19 million tonnes with average productivity of 2.578 tonnes/ha. Paddy is grown in 18 districts of Haryana. Haryana stands 1st in export of Basmati Rice which is very famous all over the world. Area under Paddy cultivation in 2017-18 in Haryana is around 13.85 lakhs ha with production around 44.53 lakhs tonnes. Average productivity of Paddy in Haryana is around 3.213 ton/ha which is very much higher than national productivity. The methods of Paddy cultivation in Haryana are Normal Rice Transplanting (NRT). Although NRT is commonly used method of Paddy cultivation in most of the parts of India but due to the excessive use of chemical fertilizers, insecticides and pesticides in these methods there is degradation in soil fertility, underground water pollution and environment pollution takes place. To overcome these problems sustainable rice farming like SRI (System of Rice Intensification) is a good choice.

The system for rice intensification (S.R.I) was developed by French Priest Father Henri de Laulani in Madagascar in the 1980's in an effort to find sustainable agricultural practices which lead to higher productivity, optimum use of capital and labour, less input cost and less requirement of water.

*Corresponding Author

There are a lot of benefits from SRI like water saving, labour saving, decrease in environment pollution, increase in yield and decrease in cultivation cost. SRI represents an integrated and agro ecologically sound approach to irrigated rice cultivation, which may offer new opportunities for location-specific production systems of small farmers. Stoop *et al.*, 2002 proposed that such approaches could unlock currently untapped production potentials of rice, allowing farmers to realize yields of up to 15 Mg ha⁻¹ or more with reduced irrigation and mineral fertilizer inputs. Rajendra Prasad (2008) has reported the value of sustainability index for yield of SRI technology in Andhra Pradesh as 52 per cent in 2006-07. Yuan (2002) reported that the water applications could be reduced by as much as 65% on SRI plots compared with conventional irrigated ones and same time yield was 16 t/ha in trials with a Super-1 hybrid variety grown with SRI methods is 35.6% higher than the 11.8 t/ha achieved with the same hybrid in conventional, water intensive methods. With this background, present study was undertaken with the following objective:

To work out the comparative economic analysis of SRI with conventional rice farming in Karnal district of Haryana province in India.

MATERIALS AND METHODS

The study was conducted in Karnal district in Haryana province (India). Sixty farmers, 40 adopters of SRI and 20 conventional rice farming farmer were selected randomly from major paddy growing area.

To work out the cost and returns of SRI farming primary data related to cost and returns component for crop year 2018-19 were collected by conducting personal interview. Whereas, secondary data were collected from various published and unpublished sources i.e. Statistical Abstract of Haryana, Agricultural statistics at a glance etc.

Gross income/returns:

The income obtained from the sale of the product. The actual amounts received from product marketed at the prevailing price were considered for arriving at gross income.

Net income/returns:

This is the surplus over the gross costs i.e., commercial cost of cultivation. It is one of the best measures to assess and compare farm.

Benefit-cost ratio:- Gross income /total cost

Total cost = Total variable cost + total fixed cost

Return over variable cost (Rs) = Gross return – total cost

Cost of production without by product (Rs/qtls.) = total cost / total yield (qtls)

Cost of production with by product (Rs/qtls) = (total cost – by product) / total yield (qtls)

RESULTS AND DISCUSSION

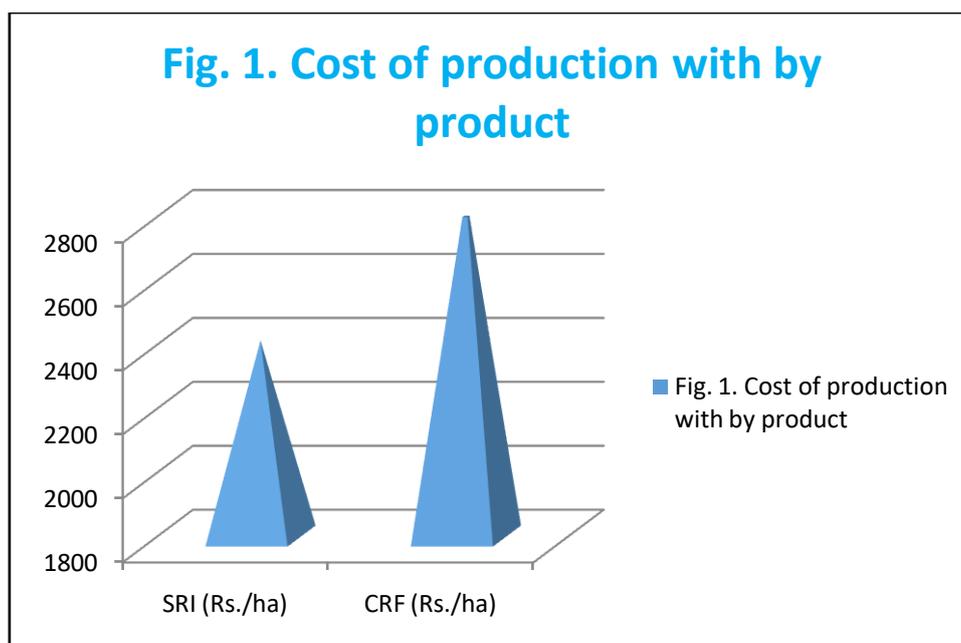
Comparative Costs and Returns in SRI and Conventional Cultivation of Paddy

A comparison of costs and returns in SRI and Conventional methods of paddy cultivation, given in Table 1, shown that there was a significant difference in the total cost of cultivation also variable cost was higher in the Conventional method (56331.60/ ha) than SRI method (52205.76/ ha). Similar results were observed by I.V.Y. Rama Rao *et al* (2011). This study shows that there is higher B: C in SRI (1.38) as compared to CRF (1.17) and also find higher gross return from SRI (168286.8) in comparison to Conventional Rice Farming CRF (148227.50) this was in accordance to the results of I.V.Y. Rama Rao *et al* (2011). Per unit cost of production in SRI decreased as compared to CRF. Also the Cost of production with by product was lesser as compared to CRF (Fig.1.)

Table 1. Comparative cost of cultivation in SRI and CRF in Karnal

Sr. No.	Particulars	SRI		CRF		
		Q/ha	Value (Rs/ha)	Q/ha	Value (Rs/ha)	
1	Production	(a) Main Product	48.49	163378.05	42.54	143330.63
		(b) By Product	45.35	4908.75	39.12	4896.88
2	Gross return (Rs)		168286.8		148227.50	
3	Variable cost		52205.76		56331.60	
4	Total Fixed cost		69666.14		70586.32	
5	Total cost		121871.90		126917.92	
6	Return over variable cost (Rs)		116081.04		91895.90	
7	Net return (Rs)		46414.90		21309.58	
8	B:C ratio		1.38		1.17	
9	Cost of production without by product		2513.34		2983.50	
10	Cost of production with by product		2412.10		2868.38	

* Q = Quintals, ha = hectare, B: C ratio = benefit cost ratio, Rs = Rupees



CONCLUSIONS

SRI is a climate smart resource conservation technology which increases net returns, B-C ratio and decrease cost and input use (especially of water and fertilizer). It gives significantly higher yield (5.95 Q/ha) as compared to conventional method. This system leads to significantly less water consumption by 53% as compared to the Conventional method. Also seed cost reduces significantly by 34% that of CRF. SRI increases benefit significantly by 29240 Indian rupees per ha as compared to Conventional method. SRI increases the benefit cost ratio significantly as compared to Conventional method. Therefore, it is concluded that adoption of SRI is beneficial as compared to conventional methods for rice cultivation in Karnal district of Haryana.

REFERENCES

Agriculture Update AU Volume 12 | TECHSEAR-6 | 2017 | 1705-1709, www.researchjournal.co.in
Barah, B.C. (2009). Economic and ecological benefits of system of rice intensification (SRI) in Tamil Nadu. *Agricultural Economics Research Review*, **22** (2):209-214.
I.V.Y. Rama Rao. (2011). Estimation of Efficiency, Sustainability and Constraints in SRI(System of Rice

Intensification) *vis-a-vis* Traditional Methods of Paddy Cultivation in North Coastal Zone of Andhra Pradesh. *Agricultural Economics Research Review* Vol. 24 July-December 2011 pp 325-331.

L. P. Yuan (2002). A Scientist's Perspective on Experience with SRI in CHINA for Raising the Yields of Super Hybrid Rice. Assessments of the system of rice intensification (SRI), proceeding of an International Conference held in Sanya, China in April 1-4, 2002.

Ministry of Agriculture and Farmers Welfare, Govt. of India. (ON1704).

Rajendra Prasad, V. (2008). Evaluation of economic and yield sustainability in SRI cultivation of rice in Andhra Pradesh. *Andhra Agricultural Journal*, **55**(4):527-532.

Ravi Kumar, K.N., Bapuji Rao, B. and Sree Lakshmi, K. (2004). Economics of major farming systems in North Coastal Zone of Andhra Pradesh. *Extension Research Review, National Institute of Agricultural Information Management (MANAGE)*, **V** (1):10-32.

Stoop, W.A., Uphoff, N. and Kassam, A. (2002). A review of agricultural research issues raised by the system of rice intensification (SRI) from Madagascar: opportunities for improving farming systems for resource-poor farmers. *Agric. Syst.* **71**, 249-274.

