e-ISSN: 2455-3662

EPRA Internatinoal Journal of Multidisciplinary Research

Vol : 1 Issue : 1 December 2015

Published by : EPRA Journals | Tiruchirapalli

A COMPARATIVE ANALYSIS OF TRADITIONAL AND SRI METHODS OF PADDY CULTIVATION IN CHITTOOR DISTRICT OF ANDHRA PRADESH

Peruri Upendra[1]

[1]Department of Economics,
School of Global Studies,
Central University of Kerala,
Kasaragod-671314
Kerala, India.
peruriupendraeco@gmail.com

ABSTRACT

This is an attempt to examine the advisability of the System of Rice Intensification (SRI) method of paddy cultivation as compared to the traditional cultivation method (TCM) followed by farmers. It is well known that traditional method of paddy cultivation suffer from many shortcomings. Traditional method requires usage of large amount of water in a wasteful manner and is mostly driven by the use of chemical fertilizers and pesticides. It is observed that traditional method is not cost effective which results in the untold miseries to the farmers. Also, traditional method of paddy cultivation is carried out in an unscientific manner. For instance, paddy seedlings are transplanted without any proper plan in terms of number of seedlings to be planted in a spot or poor levelling off the field causing wastage of water as well as effort. All these shortcomings found in the traditional method of paddy cultivation calls for a better method, so that more output can be produced in a cost effective manner. It was in this context, the system of rice intensification (SRI) method of paddy cultivation was introduced by the Government of Andhra Pradesh in the year 2003. Hence, it is important to conduct a research into the efficacy of the SRI method over traditional method. This study aims to investigate the following:

i. *The extent of the adoption of the SRI*
ii. *The primary reason for switching over to SRI*
iii. *To elicited the response of the SRI farmers.*
iv. *To see whether SRI is advisable from the point of view of cost of production and the way is which entire cultivation exercise is undertaken.*
v. *Is there any increase in the productivity of rice under SRI.*

KEYWORDS: *Paddy Cultivation, Agriculture, RiceYield, Farmers, Seeds, Fertilizers*

INTRODUCTION

Rice is the staple food for more than half of the world's population. In Asia, more than 80% of the people live on rice, and their primary food security is entirely dependent on the volume of rice produced in this part of the world (Kabir, 2006).The world paddy production was 614.65 million tonnes in 2004-2005, covering an area of 153.51 million hectors with on average yield of 3.87 tonnes per hectors. Developing countries contributed about 90% of the total world rice production. According to the food and agriculture organization (FAO) of the U.N., Ten countries in the world account for 80% of the world rice production. Vietnam and India are leading producers in the world. World rice production nearly doubled from the 1960s to the 1980s, mainly due to the technological advances referred to as the Green Revolution. The Green Revolution comprised the replacement of traditional cultivars with modern cultivars and the increased use of external inputs that included mineral fertilizer, irrigation water and pesticides. The expansion of this technological package was facilitated by the political incentives to construct irrigation infrastructure and to subsidize chemical inputs. After the wide spread of the green revolution throughout irrigated paddy fields in Asia, however, the rice yield increase has slackened, reflected by the decline in the annual rate of rice yield increase from 2.7% in the 1980s to 1.01% in the 1990s. As the population in rice consuming areas is still expanding rapidly, the resumption of yield increase is vital. It is estimated that 40% of more rice production will be required by 2030 to satisfy growing demand with no increases in cropping areas (Khush, 2005).

A major issue with the traditional system of paddy production, particularly green revolution technology is input intensive and favours cash rich farmers. Increasing prices of agricultural inputs prevent poor farmers from completely adopting modern production technologies (Stoop, 2002).

In order to improve resource use efficiency, it will be necessary to address the growing concerns regarding water scarcity, higher fertilizer cost, and negative environmental impacts due to the increasing use of agrochemicals for rice production. Some possible solutions include breeding superior genotypes under water-saving rice cultivation methods (Atlin 2006), improving water management and fertilizer use efficiency, more frequent split applications and the use of controlled release fertilizers. An additional benefit from cultivation rice in unfolded paddies, as done with the System of rice intensification (SRI) during most of the growing season, would be some reduction in greenhouse gas emissions (Roger, 1992).In such a situation, the system of rice intensification (SRI) was recently promoted as an alternative technology and resource management strategy for rice cultivation that may offer the opportunity to boost rice yields with less external inputs (Stoop, 2002). The system of rice intensification consists of a set of management practices that were mainly developed through participatory on farm experiments in the central highland of Madagascar in the 1980s. The main elements of SRI include early transplanting of young seedlings, transplanting single seedlings with wide spacing, mechanical weeding with a rotary push weeder, no need for continuously standing water during the vegetative growth phase, and reliance on compost as far as possible, with supplemental or no chemical fertilizer (Uphoff, 2002).

SIGNIFICANCE OF THE STUDY

The Traditional method of paddy cultivation is having demand for more water, increased cost of inputs including heavy amount of chemical fertilizers and pesticides and less returns producing negative effect on the livelihoods of the farmers. Paddy is basically not a waterplant but over the years due to over stagnation of water in the paddy plots, it has developed resistance towards more water. In the traditional paddy cultivation method, farmers adopt unscientific methods to address some of the problems in the paddy cultivation. Methods like aged nursery, difficult way of relocating seedlings, transplanting bunch of seedlings, less spacing, stagnating water and applying more chemical inputs are basically have behaviour on yield and productivity. The tendency to apply less time for cultivation also has contributed to the problem (South India Farmers Organisation for Water Management, 2007).

The SRI method seems to solve the above mentioned problems with the traditional method of paddy cultivation. The SRI method allows paddy plant to have normal growth with less water. This method is expected to increase the yield, reduce demand for water and improve the maintenances of the farmers.Spandana (2007) points out that by adopting the SRI method, the demand for water may be reduced by 50-70per cent. Now a day, the SRI method of paddy cultivation is gaining acceptance around the world. Practiced only in Madagascar until 1999, it has since demonstrated its environmentally friendly benefits from china to Cuba and from the Philippines to Peru (Uphoff, 2004).

In India, SRI was first introduced in Andhra Pradesh in 2003 by Acharya N.G Ranga Agricultural University, Hyderabad. Nearly, 10,000 farmers attempted

this method in the 2003 and reported increased yield ranging from 50-100% over normal method. Ganesh (2006) observed that this system was found effective in almost all the districts of the state on various types of soils.

SYSTEM OF RICE INTENSIFICATION (SRI)

System of rice intensification is a method for increasing the productivity of irrigated rice cultivation while at the same time reducing inputs, including seeds and fertilizers, and water requirements. This counter intuitive effect is achieved by improved management of plants, soil, water and nutrients, which stimulates biological processes that have a positive effect on plant growth and tiller production. In contrast to the green revolution methods of stretching yields through improved genotypes, new high yielding varieties of paddy seeds, or through augmenting external inputs, SRI does not require that a different seed and is used, but basically capitalizes on potentials for optimized symbiotic processes in plant roots and leaves. Not actuality a conventional standardized technology and being still a work in progress no fixed or narrow definition is possible or desirable for SRI method. SRI concepts and practices are being prolonged to other crops so SRI is not even just for rice. Essentially, SRI is a set of practices, based on complete scientific principles, for improving the growth and performance of both plant roots and soil biota, to produce healthier and productive plant phenomena from any genotype (initial genetic potential) (Uphoff and Kassam, 2009).

RICE PRODUCTION IN ANDHRA PRADESH

Rice production in Andhra Pradesh is increased. It has grown from a level of 4.8 million tonnes in 1970-71 to 14.4 million tonnes in 2010-11.This continuous increase has been largely made possible by shift in area under coarse grains to rice there are three broad phases in which rice cultivation has expanded in the state. First increase was witnessed during the Green Revolution period during 1971-81 when the high yielding varieties were first introduced in the Godavari-Krishna Delta areas. The second phase of this rise was during 1982-92, which was primarily due to the expansion of canal irrigation in the state. The third phase is between the expansions in bore well irrigation. The growth in area and production is occasionally disturbed by spells of poor monsoon. All along there was a marginal deficit of production over consumption in the state even until the late 1990s (Indrakanth, 2003 and Sambireddy, 2003). The net contribution to the central pool increased from 1.8 million tonnes in 1993-94 to 5.6 million tonnes in 2010-11.

OBJECTIVES

1. To identify the differences between SRI method of paddy cultivation and traditional method of paddy cultivation.
2. To analyse the important differential factors of paddy production under SRI and traditional cultivation method (TCM).

DATA SOURCE AND METHODOLOGY

The study is mainly based on primary data collectedfrom100 farmersinChittoor district of Andhra Pradesh. Data were collected from the farmers'throughinterview method using a questionnaire. The study also used secondary data collected from publications of Department of Food and Public Distribution, Department of Economics and Statistics, Government of India, KrishiVigyan Kendra, and Agriculture Department of Andhra Pradesh.

Chittoor district is one of the frequently scarcity affected Rayalasema districts of Andhra Pradesh, covering a geographical area of 15,152 sq., km. Administratively the district is divided in to 3 Revenue divisions, Namely Chittoor, Madanapalle, Tirupati which are further sub-divided in to 66 Revenue Mandals. As a part of this research, primary data are collected from paddy cultivating farmers.

COMPARISON OF TRADITIONAL METHOD AND SRI METHOD OF PADDY PRODUCTION

This paper focuses on a comparison of two methods of paddy production namely traditional method (TM) of paddy cultivation and SRI method of paddy production in the Chittoor district of Andhra Pradesh. This study uses primary data collected from 100 selected farmers in 10 villages and 6 Panchayaths of the Chittoor district. During the sample survey it is observed that most of the farmers are not exactly following the SRI method suggested or practiced elsewhere, but they follow a slightly modified system of rice intensification (SMSRI) method. Out of 10 villages surveyed, 50 households from six villages follow traditional method and 50 households from remaining 4 villages follow SMSRI method. Total number of sample selected is 100.

COMPARISON OF DEMOGRAPHIC CHARACTERISTICS OF FARMERS FOLLOWING TM AND SMSRI

This shows that community-wise distribution of the households considered under this study between SMSRI and TM of rice cultivation. Out of the total 50 households, 48% households are hailing from general category that

follows TM while 52 % of households surveyed belonging to OBC category go for TM. Interestingly, none of the SC household use TM. Similarly, out of 50 households under SMSRI, 80% belongs to general category and 18 % belongs to the OBC and 2 % belongs to SC category. The all farmers are under SMSRI find their income from SMSRI cultivation. At the same time, majority (29) of farmers under TM find their income from the cultivation of sugarcane and 19 household find their livelihood from sugar and mangoes cultivation. Thus it appears that SMSRI method of rice cultivation assures a secure means of living to the farmers. Most of the farmers get information about agricultural activities through FM radio. Also relatively good share of the farmers collects information from TV and neighbours etc. Above facts clearly shows that farmers are not benefiting from the agricultural experts like agricultural officers. Thus, it is felt that government must ensure that farmers are provided with necessary support through official mechanism. (Primary Survey, 2012)

MAJOR OBSERVATION

Some of the major observations of the study are the following:

- While 48 percent of the farmers using TM cultivation belong to general community, the representation of this community in SMSRI method of cultivation is almost 80 per cent.
- The study shows that farmers who follow TM cultivation are not willing to continue the paddy cultivation as it is not their main source of income. They get the major portion income from sugarcane, mango and cow milk. For the farmers who have adopted SMSRI method of cultivation, rice is their main source of income and, therefore, willing to adopt the same method of cultivation in the future. These farmers observed that though the SRI or SMSRI method of paddy cultivation is costly compared to TM of paddy cultivation, however, it is more profitable than the TM.
- The TM cultivation is very difficult now a days due to the lack of agricultural labourers. TM paddy cultivation requires more workers and the cost of labour is also very high. Following are some of the important reasons for the loss of interest of the farmers in cultivating paddy using TM.

1. Lack of irrigation facilities: basically for the TM more water is required and most of the farmers are facing water shortage problem due to lack of proper irrigation facilities.
2. Lack of electricity: Though some have access to the water, scarcity of power throughout the daytime is another major problem that the TM paddy cultivators face.
3. The TM cultivation requires large use of chemical fertilizer and pesticides for which the prices are increasing drastically.
4. most of the farmers following TM cultivation, paddy is not a commercial commodity and they cultivate paddy for their own consumption.
5. For some farmers, paddy cultivation is not profitable; still they continue it as they have no other crop to cultivate. They also feel that if they do not cultivate, they have to reinvest on labours and tractors for removing unwanted plants.
6. Instead of paddy many farmers cultivated mango trees, sugarcane as there is no reasonable market price for paddy.
7. More than 80 percentage of the farmers stopped paddy cultivation due to lack of proper monsoon and factors discussed above.

- It is mostly observed that farmers are even not ready to take the SRI/SMSRI method of paddy cultivation because such method requires more experienced labourers at least in the initial stages of paddy cultivation. Another major reason that people don't go for SRI/SMSRI is due to lack of awareness about such an improved method.

Reasons for not adopted SRI/ method:-

1. Lack of Knowledge about SRI/SMSRI method
2. In the initial stages of SRI/SMSRI method of cultivation requires more labour. Many of labour don't have the knowledge about SRI/SMSRI.
3. Water management is very important under SRI sometime; unexpected rains create serious problems to this method of cultivation compared to TM.
4. SRI/SMSRI requires proper preparation of the land before cultivation. This process is very costly when compared to TM.
5. SRI method requires warm compost for proper seedling. Most of the farmers are not aware of how to make such warm compost.
6. Farmers don't know how to manage weeding machine which is a major requirement in SRI/ SMSRI method of cultivation.

Policy implications for Government of Andhra Pradesh:-

- At present the power supply for agriculture is restricted to 4 hours; the timings should extend for 6 to 8 hours.
- All the price related factors of production should be decreased. Ex: Pesticides, Organic fertilizers, Chemical fertilizers etc.
- Scarcity for the availability of agricultural labourer is high at present; the Government should take measures in order to increase the labour in agriculture farming.
- Agriculture experts have to be appointed in each panchayath to suggest and encourage farmers with useful and helpful interventions for their betterment.
- Government should take responsibility in conducting the farmers meetings, farmers associations; farmer's awareness programs under agricultural experts.
- Government should be in the first position in providing the irrigation facilities to farmers.
- It should develop the credit, marketing, and storage facilities regarding rice production.
- The government should take mediators in Agricultural marketing and should develop infrastructure.
- The present price policy is not satisfactory, it should be developed.
- The government should make arrangements to educate the farmers about the environmental conservation; the environmental degradation and how it affect agricultural sector, especially in case of paddy.

CONCLUSION

This paper presented a detailed comparative analysis of various aspects related to traditional and SRI (SMSRI) methods of paddy cultivation in Chittoor district of Andhra Pradesh. This study is mainly based on the primary data collected from 100 farmers selected randomly from 10 villages' in 5 Panchayats of Chittoordistrictin Andhra Pradesh. Out of the 100 sample, 50 are purposively selected from farmers who have adopted traditional method (TM) of paddy cultivation and the other 50 are selected from farmers who have adopted SMSRI method of paddy cultivation. Survey is conducted based on a questionnaire and valuable information is collected by way of observation and interviews. It is observed that while a majority of the farmers (80 per cent) who adopted the SMSRI method of paddy cultivation belongs to the general community, the majority of farmers (52 per cent) who still follows the TM come under other backward community (OBC). Out of the sample of 100 farmers, only one farmer belongs to the Schedule Caste community. It is observed that paddy cultivation is not the main source of cultivation for most of the farmers who still follow the TM cultivation. Their main source of income comes from the cultivation of other crops like sugarcane, mango 19 farmers, and raising cattle. These farmers generally do the paddy cultivation for their own domestic consumption and not for commercial purpose. This may be the reason that they still follow the TM and do not go for SMSRI/SRI method. This finding is substantiated by the data for SMSRI farmers, where all the 50 sampled farmers reported that their main source of income comes from paddy production.The farmers who are aware of the SRI method of cultivation got their information and awareness mostly from F. M Radio. Other sources of awareness about the SRI method include interactions with agricultural experts, television, agricultural meetings, Raitumetra, and Neighbours. Most of the farmers who experienced the SRI/SMSRI Method of paddy cultivation reported that this method of paddy cultivation is costly when compare with TM of paddy cultivation. At the same time they are also aware that SRI/SMSRI method of paddy cultivation is more profitable when compared to TM. It is noted that farmers under SRI method also use chemical fertilizers. Rice varieties like Nellusambalu and GalekaraMasura are the varieties mostly used by cultivators under both methods of cultivation. The main conclusion from the analysis is that SRI/SMSRI method can be extended to more areas by spreading awareness among the farmers.

REFERENCES

1. *Ganesh, M., Reddy, Manohar,N., SubbaRao, L.V., and Rani, Radhika, K., (2009) 'Problems and Prospects of System of Rice Intensification (SRI) Method'., National Seed Project, Acharya N.G. Ranga Agricultural University, Hyderabad.*
2. *Kabir, H.,(2006) 'Sustainability of intensive rice production threatened', LEISA (Low-External-Input and Sustainable Agriculture.*
3. *Khush, S., (2005), 'Green Revolution: Challenges ahead' International Rice Research Institute, Philippines.*
4. *Stoop,Willem, A., (2002) 'The System of Rice Intensification (SRI) results from exploratory field research in ivory coast, further research requirements and prospects for adaption to divers agro-ecosystem's West African Rice Development Association, (WARDA), 01 BP 2551, Bouake, Ivory coast.*

5. *Zho, D.L., Atlin, G.N., Bastinaus, L., Spiertz, J.H.J., (2006) 'Crrigendum to Developing selection protocols for weed competitiveness in aerobic rice', Field Crops Research, Vol.99, Issue, 2-3.*
6. *Carvalho, Fernando,P., (2006) 'Agriculture, pesticides, food security and food safety'. Environmental Science & Policy 9, 685-692.*
7. *Marie-Soleil, Turme. Benjamin L,Turne and Joann K, Whalen. (2011) 'Soil fertility and the yield response to the System of Rice Intensification' Cambridge University press.*
8. *Venkateswarlu, B., Ramakrishna, Y.S.,(2006) 'Rain fed Agro-Ecosystem Production Systems Research.' National Agricultural Technology Project, Central Research Institute for Dry land Agriculture, Hyderabad.*
9. *Rama Rao, I.V.R. (2011) 'Estimation of Efficiency, Sustainability and Constraints in SRI (System of Rice Intensification) vis-à-vis Traditional Method of Paddy Cultivation in North Coastal Zone of Andhra Pradesh' Agricultural Economics Research Review, Vol.24 pp325-331, Cost of Cultivation Scheme, Regional Agricultural Research Station, Anakapalle, Visakhapatnam, Andhra Pradesh.*
10. *Adusumilli, Ravindra.,Murthi, Ramana., Cheralu, C. Indrakanth. And Laxmi, Bhagya, S (2010) 'potential of system of rice intensification for systemic improvement in rice production and water use: the case of Andhra Pradesh, India. Watershed Support Services and Activities Network (WASSAN), Hyderabad, India.*
11. *www.iwmi.org/iwmi-tata/apm2012*
12. *htt://indianwaterweek.water.tallyfox.com*
13. *www.elsevier.com/locate/envsci*
14. *sri.ciifad.cornell.edu*