An Innovative Move towards Increasing Rice Production: A Study on System of Rice Intensification Method (SRI Method) In Daang District of Gujarat

Prashant Pareek
Assistant Professor
MBA, N.R Institute of Business Management
Gujarat Technological University
Ahmedabad, Gujarat

Abstract

For any country and for any state in that country the biggest burning issue is of food grains. In this era of industrialization and urbanization the land required to cultivate food grains is reducing. Since our nation India is an agricultural country with almost 60% of population is associated with this sector in a direct or indirect manner for their livelihood, thus for farmers it becomes huge question to survive because they also need money, education for children, and other facilities in order to live a happy and peaceful life. Farmers have an option of growing cash crops so that they can get quick access to money but then the problem of food grains will deteriorate further. The answer to these queries is one in which whatever crop farmer grow in his farm its productivity should increase. Large numbers of farmers in villages of Daang district in Gujarat state are applying System of Rice Intensification (SRI) method in order to improve the productivity of their farm output. This paper attempts to explore the insights of SRI method, how it is applied, what are the benefits of this method, and how it is better than other traditional methods of growing rice. The study has been conducted in Daang district of Gujarat state on those farmers who are applying SRI method for rice production.

Keywords:

System of rice intensification (SRI), Farm productivity, Daang district, agricultural issues, Rice production in Gujarat

Introduction

So many debates and discussions often take place on the issue of increasing the productivity of agricultural sector in India with the stated objective of food security for the people of this country and environmental sustainability. Many options to increase the productivity of land are being suggested by the experts of this sector and out of these options SRI is one such method of rice production which was invented by Father Henry De Laulanie in Madagascar (1983), a French priest who had experimented for almost a decade with the traditional methods of rice growing and invented SRI method.

The SRI is based on the principle that the rice plant doesn't necessarily need to be submerged in water to grow. Traditionally, a nursery bed is

first prepared, the seeds are sown, and the saplings are allowed to grow for 25 days, after which they are transplanted into the main field in bunches of six to seven, scattered six inches apart. But in SRI, 8-12-day-old saplings are transplanted — individually — and spaced 10 inches apart. Young saplings adjust easily to the soil while the distance between them allows for more nutrition, unlike the traditional system which has them competing for nutrition. Less water and more spacing between plants create an 'aerobic condition' that promotes better plant growth. SRI uses less seeds and chemical inputs, which promotes soil biotic activities in and around plant roots, making them more resistant to pests. A liberal application of compost, and weeding with a rotating hoe that aerates the soil, improve productivity with yields of eight tons per hectare — about double the present world average and thrice the Indian average.

While a kg of rice produced traditionally consumes anywhere between 3,000 to 5,000 litres of water, implementing SRI halves the requirement. Earlier considered unworkable without irrigation, SRI is now seeing results even in areas with highly sporadic rainfall and no irrigation. Recently, it was also researched that SRI can be extrapolated for sugarcane, millet and wheat. For most of India, this should be a magic wand. This whole method is divided into 6 stages

(1) Improving the seeds of rice to be cultivated

(2) Preparation of nursery bed

(3) Carrying the plant from nursery to the farm

(4) Transplantation

(5) Removing excess grass and maintaining the required level of water

(6) Harvesting

In Gujarat state rice occupies about 10% of the gross cropped area of the state and accounts for around 15% of the total food grain production. It is grown on an average about 7 lakh hectares of land. The total production of rice in the state is about 11 lakh tons with productivity of 2000kg per hectare.

The data pertaining to the area, production and productivity of the total rice (irrigated and drilled) in the different agro climatic zones of the Gujarat in last five years are presented in

Table- I

Year	Area/(00 ha)	Production/ (00 mt)	Productivity/ (kg/ha)
2008	7221	12255	1697
2009	7302	12785	1710
2010	7335	12800	1715
2011	7400	12995	1750
2012	7488	13000	1775

Daang is known as tribal and dry district of Gujarat. It's very remote and underdeveloped region of Gujarat with average annual rainfall of 1900mm. Daang witnesses irregular distribution of rainfall and that is the reason why 70% of the villagers cannot cultivate enough food from their own land to feed their households. Seasonal mass migration can be seen from this district to earn livelihood.in the last three or four years farmers of Daang applied SRI method for rice cultivation with the support and training from BAIF, NABARD, and AAGA khan rural support programme.

These farmers have witnessed a significant rise in the production of rice after applying the SRI method. This paper intends to corroborate the results these farmers have obtained after the application of SRI method.

Research Methodology

Research Objectives

- To explore insights of SRI method
- To understand its application
- To know the benefits of SRI method obtained by the farmers of Daang district after its application
- To identify how this method is different in comparison to other traditional method of rice farming
- To Identify how various state and national level institutions are supporting the farmers of Daang district in the application of SRI method

Scope of the study

This study has been undertaken to gain insights of SRI method in Daang District of Gujarat state. In this study 14 villages of Daang district has been covered and in those 14 villages 247 farmers were being sampled to meet the above said research objectives.Villages which were visited are Dhakmal, Bhavandagad, Sati, Ahwa, Manpur, Vangan, Baripada, Bhendmal, Chankhal, Chikatiya, Daguniya, Ghoghli, Harpada, and Bhalkhet.

Data collection sources

This study is synthesis of primary data as well as secondary data

- ***Secondary data***: secondary data was collected to mainly gain the insights of SRI method and to further plan the research process. Below mentioned sources were used to obtain the clarity on this study
  - Documentary film prepared by AAGA KHAN rural support programme
  - Website of Cornell agricultural university
  - Articles published in news papers like DNA and Business standard
  - Literature of NABARD and BAIF
  - Initial research documents of 24 Alphabets Productions (Documentary Producers)
- ***Primary data***: Primary information was collected through personal interviews of Farmers in 14 villages of Daang district in Gujarat state. This data collection source was utilized to obtain information from the farmers regarding SRI method, since only those farmers were being interviewed who had used SRI method for rice farming.

Sampling

- ***Sample size***: 247 farmers were being selected in 14 villages of Daang district in Gujarat state to undertake this study
- ***Sample unit***: Farmers who has actually applied SRI method for rice cultivation
- ***Sampling technique***: Sampling technique was Non probability sampling with judgment sampling since only those farmers who had applied SRI method for rice farming were being sampled not other farmers. The 14 villages for the study were selected as per convenience of investigator

Research tool: Investigator administered questionnaire was used as a research tool

Research design: this study has used both research designs Exploratory and Descriptive. Since the purpose was to gain insights of SRI method and then to describe the applicability, benefits, comparison and opinions on this method in this study.

Limitations

In Daang district of Gujarat there are 311 villages (as per census 2011) and in these villages there are thousands of farmers and even there are many farmers who are using SRI method for rice cultivation. For this study only 247 farmers from 14 villages were sampled. The villages were selected as per convenience, so the limitations of convenience can be seen in this study.

DATA ANALYSIS

1) Difference between conventional practice and SRI method in terms of cultivation

Table- II

Conventional practice	Sri method
Use of little or no organic manure or chemical fertilizers	Use of organic manure (Amrut pani) is ensured
Age of seedlings for transplanting : 25-30 days	Age of seedlings for transplanting 12-15 days
No. of seedlings per hill : 4-6	No. of seedlings per hill: 1
Approximate plant to plant distance : 15cm	Spacing for seedlings: 25* 25 cm
Little or no weeding	Two manual weeding, first at 15 days after transplanting, and then at 40 days after transplanting

2) Difference between conventional practice and SRI method post cultivation

Table- III

Particulars	Sri method	Conventional
Plant height (cm)	**90**	**84**
No. of plants per m square	**16**	**32**
No of tillers per plant	**17**	**12**
No. of panicles per plant	**13**	**08**
No. of roots per plant	**299**	**156**
No. of seeds per panicle	**144**	**102**
Grains production (quintals per ha)	**54**	**30**
Straw weight (grams per m square)	**373**	**316**
Weight of roots (grams per m square)	**156**	**134**

3) Benefits of SRI method observed by the farmers after its application

Table- IV

Sr no	Key benefits
1	This method reduces the amount of seed requirement by 80%
2	The rice plant produces three times as many tillers, doubling grain yields
3	In this method grain ripens earlier thus it can be harvested earlier, it allows the dry season crop to take advantage of residual moisture in the soil
4	This method requires less number of labors because spacing in plantation makes the work of weeding and harvesting easy.

4) Kind of support farmers are receiving from various NGO's like Aaga khan rural support programme, BAIF, Pradan etc for application of SRI method

Table- V

Sr no	Support from various NGO's
1	Training regarding the SRI method by the field officers of NGO's
2	Experimenting SRI method in small piece of land to demonstrate its advantages
3	Experimenting this method on other food grains such as wheat, paddy, etc to increase productivity
4	Encouraging other farmers who are not using SRI method to use it for rice farming by giving live testimonials of other farmers who have used it and have obtained its benefits

5) What type of performance of various types of rice farmers have observed after the application of SRI method

Table- VI

Variousvarieties of rice	Grain yield kg per ha (Conventional practice)	Grain yield kg per ha (SRI method)
Hybrid	3100	6000
Improved	3400	5400
local	1900	3800

6) Rice production scenario of Daang district

Table- VII

Area(lakh ha)	Percent of state's rice area	Production (lakh tons)	Percent of state's production	Productivity (kg/ha)
0.72	12	0.81	7.4	1230

Key Findings

- Out of 247 farmers being sampled in this study 90% farmers were of the view that SRI method leads to reduction in the amount of seed requirement
- All the farmers said that if the fields are properly leveled then the application of SRI method becomes easy and more advantages can be realized
- Almost 50% farmers were not using compost fertilizers and they were also not aware of solution water and its benefits.
- About 60% farmers were lacking in the practice of using organic manure for rice cultivation
- All the 247 farmers agreed that use of SRI with local rice varieties showed 100% increase in grain yield
- Out of 247 farmers 60% started to produce rice with SRI method after the training and support provided by the NGO's. and rest 40% started after listening to positive word of mouth communication from other farmers who have used it
- 70% farmers responded that initially they had sown 0.70 kg of seeds on a trail plot of 0.2 to 04 ha and they found three times as many tillers of rice as in the fields where they are still doing farming with traditional methods.
- All the farmers were of the view that in the last three years of SRI method application they were having 15 to 20% yield advantage. Almost 50% is the increase in their net returns per hectare.
- All the farmers agreed that almost 50 to 55% reduction in the usage of water at field level was also bringing substantial reduction in the electricity usage.
- 90% farmers were satisfied with the kind of support they were receiving from the NGO's in terms of training regarding SRI method
- Out of total 247 farmers who were sampled in this study 50% are planning to introduce SRI methodology in the cultivation of other crops also like wheat, paddy, millet, etc
- 60% farmers were of the view that though SRI method increases productivity of the crop but its successful application for cultivation of rice needs lot of efforts and hard work in the field and off the field also
- Farmers agreed that the need of workers or land labors has been reduced to half after the application of SRI method. For example with the conventional method per acre of land required about 30 workers

for cultivation of rice but with the SRI method the number has gone down to only 15.

- out of the total 247 farmers 60% farmers who had undergone proper training organized by various NGOs and executed SRI method as per the guidelines given to them in the training had received more benefits as compare to those who had no formal training and knowledge regarding SRI method
- All the farmers were very satisfied after the application of SRI method in their farms

Conclusion

From this study on SRI method it was found that the farmers of Daang district are reaping benefits of this method. Even in the year 2014 when this study was going on another 500 to 600 farmers were getting ready for the application of SRI method. Generally it is believed that if as a farmer one wants to increase the productivity of land and other resources then the only option is to increase the input. Increasing the input will require high cost seeds, costly fertilizers, increased usage of water and more number of labors etc. This high input cost will again affect the farmer on his financial condition. Sri Method on the other hand is one such method which needs less water, less seeds, less resources and as an output will give increased amount of production. In Daang district Aagakhan rural support programme (AKRSP) with the help of NABARD has taken this initiative to promote SRI method and by now it has reached up to 600 farmers and their mission is to reach about 2000 farmers by 2016. As per one report of NABARD which shows that in Gujarat there are nearly 10 lakh farmers with an average land of 0.5 hectare can be benefitted to a huge extent from the application of SRI method because these farmers fall in the category of small or medium and they are not self dependent in terms of their agricultural production.

References

Dr A.R.Pathak, Dr Atul M Mehta, Dr R.D Vashi, Status paper on rice in Gujarat, Rice knowledge management portal (RKMP), Directorate of rice research, Rajendranagar, Hyderabad.

Ravindra Adusumilli, S. Bhagyalaxmi, (2011), Potential of the System of Rice Intensification for Systematic Improvement in Rice Production and Water use: The case of Andhra Pradesh India, Paddy water environment, Springerlink.com

M. Rajeshwar, M.A Aarif Khan,(June 2008), Comparison of System of Rice Intensification and Conventional Method of rice planting under Nagarjuna Sagar Project left canal command area of Andhra Pradesh, India, Asian Journal of Soil Science, Volume 3, No 1, 53- 57,

C. Shambhu Prasad, (2007), Rethinking Innovation and Development: Insights from System of Rice Intensification in India, The Public sector Innovation Journal, Volume 12(2), Article 3

MD. Riton Chowdhury, Vinod Kumar, (2013), Studies on the Water Use Efficiency and Nutrient Uptake by Rice Under System of Intensification, The Bioscan, 9(1), 85- 88

P. Sri Ranjitha, K.I Reddy, (2014), Effect of Different Nutrient Management Options on rice under SRI method of Cultivation, International Journal of Plant Animal and Environmental Sciences, Volume 4, Issue 1.

The Madhya Pradesh Rural Livelihood Project, (January 2011), More rice from less seed, Success stories 4.

Patwardhan and Patel, (2007), Promotion of System of Rice Intensification in rain fed rice Cultivation among the farmers, BAIF Development Research Foundation, Maharashtra.

" Rice to Riches Story for Paddy Cultivation in Daang", Daily News and Analysis, 24th May 2014, Ahmedabad.

" Farmers and Experts in Gujarat root for new Rice Transplant Method", Press Trust of India, 23rd May 2014, Ahmedabad.

"Aaga khan rural support programme", (2013), SRI Method, Documentary Film.