

RESEARCH ARTICLE

SRI method: A new technique for rice cultivation in rural Tripura

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SUMMARY

SRI is a combination of several practices those include changes in nursery management, time of transplanting, water and weed management. It differs from most agricultural technologies promoted in recent decades in that it is a civil-society innovation, originating not from research stations or laboratories. Farmers adopt the SRI principles according to their specific conditions. In Tripura all sections of society are practicing SRI. Farmers who have practiced the SRI for two to three seasons could easily overcome the difficulties. The main objectives of this paper were: (a) to study the benefits of system of rice intensification method; and (b) to study the implementation of system of rice intensification method in Tripura.

Key Words : System of rice intensification method, Rice, Agriculture, Tripura

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The system of rice intensification (SRI) is a methodology aimed at increasing the yield of rice produced in farming. It is a low water, labor-intensive, method that uses younger seedlings singly spaced and typically hand weeded with special tools. SRI methodology is based on four main principles that interact with each other: (a) Early, quick and healthy plant establishment; (b) Reduced plant density; (c) Improved soil conditions through enrichment with organic matter; and (d) Reduced and controlled water application

(SRI Methodologies, 2016). SRI originated in Madagascar in the 1980s and is based on the cropping principles of significantly reducing plant population, improving soil conditions and irrigation methods for root and plant development, and improving plant establishment methods (SRI-Rice, 2016).

SRI is a combination of several practices those include changes in nursery management, time of transplanting, water and weed management. It requires careful leveling and raking, with drainage facilitated by 30 cm wide channels at two-meter intervals across the field (System of Rice Intensification, 2014). Initially it appeared to be labour-intensive, which looked like a barrier to adoption in most rice economies, although its great increase in labour productivity, the most relevant

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consideration, made it attractive for farmers nevertheless since enhancing the productivity of labour is most crucial to their income (Prasad, 2006).

MATERIAL AND METHODS

The paper is based on secondary information. Informations were collected from published sources, like journals, books, news papers, government reports, magazines etc.

RESULTS AND DISCUSSION

SRI cultivation is a 'system' rather than a 'technology' (Subbaiah *et al.*, 2014). It involves the application of certain management practices, which together provide better growing condition for rice plants, particularly in the root zone, than those for plants grown under conventional practices (Halder *et al.*, 2012). The benefits of SRI are multi-fold, especially in resource conservation (water, land, energy, seeds and labour), rice production and addressing the challenges of climate change. SRI differs from most agricultural technologies promoted in recent decades in that it is a civil-society innovation, originating not from research stations or laboratories, but from the dedicated work of a Jesuit priest, subsequently amplified and adapted through the efforts of farmers, NGOs and other non-state actors (Uphoff, 2014). Thus, SRI requires serious attention from national policy makers (Thiyagarajan and Gujja, 2013).

Farmers adopt the SRI principles according to their specific conditions. It can be practiced without any chemical inputs, although these can be used as an option. SRI transplanting takes more time when farmers are first getting accustomed to handling tiny seedlings (Uphoff, 2012). The SRI effect can be seen not only in the yield gains, but also in the rice plants themselves. Plants grown under such practices manifest a very

different phenotype (Lakpale and Shrivastava, 2012). It uses much younger seedlings (8-14 days old). This approach encourages profuse tillering because younger seedlings can quickly become established without suffering from transplanting shock (Gujja and Thiyagarajan, 2009).

In Tripura all sections of society are practicing SRI. Women farmers of tribal and Manipuri community are frontrunners, and their farm activities and crop management is excellent. Farmers have difficulties in adopting all the SRI principles due to a mindset or in other words due to traditional habits. Sometimes a fear psychosis also prevents switching over to a new system. Farmers who have practiced the SRI for two to three seasons could easily overcome the difficulties (SRI Fact Sheet-Tripura, 2015). Over 90 per cent farmers of Tripura have been benefited from the SRI method (Shr, 2009). The improved farming with various animal and crop components can play a significant role in increasing manifold production, income, and nutrition and employment opportunities of rural populations (Yadav and Debnath, 2013).

Department of Agriculture, Tripura started the SRI on an experimental basis with just 44 farmers. Large-scale adoption of the method started in the 2006-07 and since then around 39,490 hectares of land in the state has been covered under SRI benefiting over 100,000 farmers (Das, 2016). SRI was not known outside Madagascar until 1999, but SRI is under evaluation in 29 countries at present. Adaptability under different agro-climatic conditions of Tripura was studied from 1999-2002 for five seasons covering both aman and boro seasons. It is a technique of increasing productivity by changing management of plant, soil water and nutrients; it involves single young seedlings planted widely on aerated soil and most importantly keeping rice field moist but not flooded (Nath and Dey, 2012).

Table 1: Comparison between conventional practice and SRI practice

Conventional practice	SRI practice
Transplant older seedlings, 20-30 days old, or even 40-60 days old in traditional practice.	Transplant young seedlings, 8-12 days old, and certainly less than 15 days old, to preserve subsequent growth potential.
Transplant seedlings in clumps of plants and fairly densely, 50-150 plants m ²	Transplant seedlings singly, one per hill, and in a square pattern, 25x25cm, or wider if or when the soil is more fertile.
Maintain paddy soil continuously flooded, with standing water throughout the growth cycle	Keep paddy soil moist, but not continuously saturated, so that mostly aerobic soil conditions prevail
Use water to control weeds, supplemented by hand weeding or use of herbicides	Control weeds with frequent weeding by a mechanical hand weeder (rotating hoe or cono weeder) that also aerates the soil
Use chemical fertilizers to enhance soil nutrient supply	Apply as much organic matter to the soil as possible; can use chemical fertilizer, but best results from compost, mulch, etc.

Though a small state (10,491 sq km) with a cropped area of 280 000 ha, the achievement with regard to SRI is considerable and provides hope and lessons to offer for the rest of the country. An estimated 14,000 ha of rice in 2006-07 is under SRI that is nearly eight per cent of the total land area under paddy. Demonstration plots of SRI were planned in 400 places across the state in 2004, up from 88 in 2003. The Chief Minister instructed every village pradhan to visit the demonstration plot and explore how it could be taken up in their village. There is a Govt. incentive for SRI that amounts to a total of Rs. 4500 per ha. Of this, most is in-kind and Rs. 500 in cash and Rs. 400 for procuring organic matter for composting and Rs. 100 for nursery management. The democratic decentralization through the Panchayati Raj system was an important factor in the success of SRI (SRI Success story in Tripura, 2007).

Conclusion :

The introduction of SRI in India is dated in 1998-1999 (Glover and Florio, 2014). It can be a most suitable method of rice cultivation to poor farmers who have relatively more labour than land and capital. It has the advantage of cost effectiveness and increased yield per unit area when compared to conventional paddy cultivation. However, there are some areas which need to be addressed for up-scaling SRI in our country. Majority of the farmer's perceived SRI technology good as it reduced the seed quantity and cost, resulted in higher yield as compared to normal paddy cultivation methods and there was judicious use of irrigation water. Similarly majority of the farmers rated (Biswas and Nath, 2013).

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