

Role of System of Rice Intensification Method in Improving Health and Nutritional Security: A Micro Level Study in Tripura State

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ABSTRACT

The comparative nutritional status of the rice growers has been examined based on the rice cultivation method which is known as System of Rice Intensification (SRI) over Non-SRI. The results are based on the primary information collected from the farmers of Tripura state that was selected from the two districts viz, South Tripura and West Tripura district. The livelihood security indicators given in the model (CARE, 1996) were used to work out the nutritional index of both the SRI and Non-SRI households. The study has revealed that the quality of life in terms of health and food consumption in terms of calories intake by the SRI household was found to be better than the non-SRI household. The commodity-wise per capita food consumption was more diversified in SRI household which shown a shifting in food consumption to high value food such as meat, fish and nuts. Consequently, it improved the calories intake of the SRI household than to the Non-SRI household of the state. Therefore, the method has its novelty to improve the nutritional security but still the state has lot many potential to improve it as the state is lagging behind in respect to calories intake in comparison to the national level consumption. From the study it is suggested that the SRI method of rice cultivation has much potential to enhance the production of rice which leads to improve the livelihood and income of the farmers and consequently it helps to improve the nutritional security of the households. Therefore, SRI farming must be taken up at mission mode level in the state.

Key words: SRI; Non-SRI; Nutrition; Calories; Commodities;

Health and nutrition are important as ends in themselves and often are emphasized as essential components of basic needs in developing countries. So far, the agriculture and nutrition sectors have tended to operate in separate spheres, and little effort has been made to use agricultural policies and programs specifically to improve human nutrition. A few programs and approaches, however, point to the significant potential for leveraging agriculture to improve nutrition (IFPRI, 2011). Agriculture as a source of food is becoming increasingly important in a world of diminishing resources and an ever-increasing global population (Brennan, 2012). It is the main source of livelihood as it employs 60 per cent of the total workforce (FAO, 2013). The potential of agriculture for producing nutritious food is not appropriately tapped for reducing

the malnourishment, food quality but by adopting a multi-sectoral approach (Das et al. 2014). However, innovation technology in agriculture need to be more nutrition sensitive for improving nutritional outcome (FAO, 2013). In the recent past, several studies have focused on leveraging or modifying agriculture to enhance nutrition. Many review exercises have analysed the available evidences on the linkages between agriculture and nutritional outcomes. Some of them are global in nature and others have country specific focus (Vijay et al. 2016). Among the new methods of farming the System of Rice Intensification (hereafter SRI) is an emerging method in rice cultivation being practiced in the state of Tripura. As whole the state is producing 713222 MT in area of 254743 ha, in which SRI contributing 23.35 per cent of area and 24.69 per cent

of production in the state (*GoT, 2013*). Rice is major in region as well as in the state. Therefore, the productivity of rice need to enhance through SRI which will help to fulfil the requirement of food as well as nutrition of human being in the state. The present paper focusing on the intervention of SRI method to improve rice yield with its impact on the food security, calories consumption and health security of the rice farmers.

METHODOLOGY

The present paper was an outcome of a study conducted in Tripura state to assess the nutritional requirement of the rice farmers between the SRI adopters and the Non-SRI farmers. To select the respondents, a multi-stage stratified random sampling procedure was adopted. Based on the highest area and production of rice cultivation under the SRI method, two districts *i.e.*, South Tripura and West Tripura district was selected. From each selected districts two blocks namely-Jolaibari and Bogafa from South Tripura and two blocks *viz.*, Lefunga and Bishalgarh from West Tripura district were selected purposively on the basis of highest area under the SRI method. Then a sample of 100 respondents from SRI and 100 respondent of Non-SRI household using proportionate to total size of population of SRI and non-SRI respondents in respective villages was selected. Thus, a total sample comprises of 200 household of SRI and Non-SRI was collected for the study.

The information on the nutrition-sensitive aspect was based on the primary data pertaining to food security, and health security was collected from these households. The indicators given in the livelihood security model (*CARE, 1996*) were used to work out the nutritional index of the households. The selected indicators have been explained in the following Table 1.

Table 1. Selected indicators

Livelihood security outcomes	Indicators	Measurement
Food Security	Calories Adequacy Ratio (CAR)	24 hours recall method
	Diet diversity	24 hours recall method
	Health services, Level of pre-natal and eproductive	Scale developed based on service
Health Security	Accessibility to health services	Scaled developed based on the accessibility to primary health centre and government hospital
	Quality of sanitation facility	Wealth Ranking system was developed

RESULTS AND DISCUSSION

Difference in health facilities avail by the SRI and Non-SRI : The health facilities prevailing by the SRI and Non-SRI household is presented in the Table 2. The health facilities taken after illness, availing government hospital and afford to buy medicine was found to be equally utilised by both the SRI and Non-SRI household. Except the health services during prenatal and post natal period as well as the sanitation facilities was found to be 4 per cent higher by the SRI household than the Non-SRI. Thus, a total of 8 per cent was found to be higher in SRI household than the Non-SRI.

Table 2. Health security of household of rice grower (%)

Particular	SRI (n ₁ =100)	Non-SRI (n ₂ =100)	Difference (%)
Health facility			
Take services after illness	100.00	100.00	0.00
Availing health services from govt. hospital	100.00	100.00	0.00
Afford to buy medicine	87.00	87.00	0.00
Afford to take health services during prenatal and post natal period of women	90.00	86.00	+4.00
Sanitation facilities	98.00	94.00	+4.00
Total	475.00	467.00	+8.00

Changes of health facilities avail by the women : The health facilities availing by the women in SRI and Non-SRI household is presented in the Table 3. Both the SRI and Non-SRI was found to avail private hospital and government hospital as well as both the private and government hospital together. But services avail by the SRI women to private hospital as well as to both the private and government hospital was found to be higher than the Non-SRI women who preferably more avail to the government hospital.

Table 3. Health security of women in SRI and Non-SRI during pre-natal period (%)

Particular	SRI	Non-SRI
Private hospital	38.46	23.08
Government Hospital	46.15	69.23
Both private and government hospital	15.38	7.69

Changes in food consumption pattern : The per capita consumption of different food commodities in SRI and Non-SRI household per individual is presented in the Table 4. The rice farmers who adopted SRI method, their per capita consumption of rice has increased significantly as compared to Non-SRI. The per capita consumption of high value food commodities such as pulse, meat, fruits, milk, eggs, fish and nuts has increased on account of increase in income as well as the tastes and preferences in SRI household. The per capita consumption of vegetables has declined in SRI farmers which is indicated to be 15.74 per cent. Hence, the dietary shift in favour to high value food has been found prominent and pervasive in SRI household as compared to the Non-SRI household.

Table 4. Commodity-wise per capita food consumption by the SRI and Non-SRI household (Kg/day/person)

Items	SRI	Non SRI	Change, %
Rice	0.51	0.45	13.49
Pulse (Dal)	0.05	0.03	49.76
Meat	0.06	0.04	37.78
Vegetable	0.31	0.37	-15.74
Fruits	0.14	0.11	25.51
Milk	0.09	0.07	24.93
Eggs	0.32	0.21	47.83
Fish	0.07	0.06	1.26
Nuts	0.03	0.02	63.85

Calories, protein and fats consumption pattern :The estimates of per capita calories, protein and fats consumption in SRI and Non-SRI household is presented in the Table 5. The per capita calories, protein and fats consumption indicated a direct relationship on adoption of SRI method. The absolute calories, protein and fats consumption being highest for the SRI household as compared to Non-SRI household, except calories and protein derives from the consumption of vegetable was found to be declined in the SRI household. But, this may be due to the effect of diversification from vegetable to high value commodities in SRI household. The total calories, protein and fats consumption by the SRI

farmers was found to be increased by 24.54 per cent, 28.43 per cent and 35.12 per cent, respectively. Hence, the calories intake as well as the protein and fats was found to be highest in case of SRI household which may be the tendency to shift consumption to more nutritious food items as income increases compared to Non-SRI household. Despite, the calories intake by the SRI household was higher than the Non-SRI household but in comparison to the national level it was still lacking behind by 11.49 per cent (*NSSO various rounds, 2012*).

Table 5. Commodity-wise calories, protein and fats per capita consumption by SRI and Non-SRI household (Per capita/day)

Items	Calories (kcal)		Protein (g)		Fats (g)	
	SRI	Non SRI	SRI	Non SRI	SRI	Non-SRI
Rice	584.25	538.20	11.34	8.97	0.00	0.00
Dal (pulse)	26.04	17.36	2.60	1.74	0.00	0.00
Meat	238.59	110.25	8.76	4.05	11.691	5.40
Vegetable	120.43	142.93	4.19	4.97	0.00	0.00
Fruits	128.32	61.13	1.69	0.81	0.00	0.00
Milk	56.55	43.69	2.87	2.22	3.48	2.68
Eggs	473.31	320.20	15.78	10.67	25.24	17.08
Fish	144.02	142.32	6.55	6.47	6.55	6.47
Nuts	156.09	78.58	6.57	3.31	7.94	3.99
Total	1927.59	1454.65	60.36	43.20	54.90	35.62

CONCLUSION

The study on adopting SRI technology in Tripura state has revealed that there SRI household have been found to avail better health facilities than the Non-SRI. The study on the nutritional consumption of different food commodities by the SRI household has revealed a structural shift in the dietary pattern in comparison to Non-SRI household. The SRI household have been found to shift their consumption food habit from cereal to high value food than the Non-SRI household. The study has attributed this structural change to consumption diversification effect, arising due to adoption of SRI farming. With the increase in the yield also has increased the surplus of rice as well as the income level of the farmers. As a result, taste and preference of the farmers in SRI household has changed significantly than the Non-SRI household. But still the calories intake of SRI household in comparison to the national level altogether are still lacking behind. Hence, the study on the consumption pattern of the farmers it is seen that, with

the adoption of SRI farming it would increased the food diversification of the farmers. It may not be affected adversely but positively change for the SRI household. Hence, it is suggested that SRI farming should be taken up as the alternative source of nutrition for the state as a whole in order to accentuating under-nourishment in the region.

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