



Research Article

ASSESSMENT OF IMPACT OF SRI TECHNOLOGIES UNDER IAMWARM PROJECT IN ANAIVARAI- SUB BASIN

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Abstract- In Tamil Nadu, the present day rice production faces serious problems, including depleted or depleting water resources, short supply of labour and unawareness of farm implement usage. The economic magnetism of SRI cultivation is very high, giving farmers a strong motivation to accept water-saving techniques and effective use farm implements as a new norm for paddy production. In this connection, the present problem has considered conduct field survey in Anaivaraisub basin -Ariyalur District, Tamil Nadu, to evaluate the impact of IAMWARM (Irrigated Agriculture Modernization and Water Bodies Restoration and Management) Project's adoption of SRI on agronomic productivity and Farm equipment use efficiency. The adoption of SRI method in paddy cultivation has resulted in increased by 7 to 40 per cent in paddy yield.

Keywords- SRI- paddy yield - IAMWARM

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Introduction

Rice plays a pivotal role in India economy as the staple food for two thirds of the population. The annual per capita water availability in India is about 2200 M³ whereas it is about 750 M³ in Tamil Nadu. As per World standards (per capita availability – 1000 M³), our State is under severe water scarcity. It has been assessed that the against the water potential of 47,125 MCM, the agriculture demand alone works out to 49,000 MCM indicating the overdrawal of the ground water resulting in the increase of overexploited blocks [3]. The traditional method of rice cultivation requires 3000-5000 liters of water to produce one kilogram of rice [1]. This trend needs to be arrested which is possible only with adoption of new innovative technologies in agriculture practices and diversification of less water intensive crops. The cultivation of paddy (which is a high water consuming crop) through SRI practices secured to be a significant alternative for not only increasing paddy productivity, but also for savings on irrigation water and energy costs in the resource-starved regions of India. It is evident the adoption of SRI method in paddy cultivation has resulted in increased by 20% in paddy yield , net income 44.50% over the conventional cultivation, reduction of irrigation water application (42.33%), labor input (17.46%) and seed cost (87.47%) [3] Keeping above facts in view, the present investigation entitled "Assessment of Impact of SRI Technologies under IAMWARM Project in Aanaivarai- sub basin" was taken to assess percentage of farm equipment usage and SRI practice adaption in Aanaivarai sub basin, Ariyalur District, Tamil Nadu.

Materials and Methods

The field level survey was conducted in Anaivarai sub basin, Ariyalur District, located in the North Eastern part of Tamil Nadu during 2009. From a list of farmers

in this sub basin [Table-1], a random sample of 45 SRI (IAMWARM) farmers and also an equal number of farmers cultivating paddy through conventional method under tube-well irrigation system were drawn from the same blocks (Anaivarai sub basin) and interviewed in-depth and collected primary data.

Table-1 Table Number of Farmers Selected

S.No	Name of the village	Number of SRI farmers
1	Kuzhumur	20
2	Periyakurichi	5
3	Adhikudikadu	5
4	Ladapuram	8
5	Kalarampatti	7
Total		45

The data for labour and other inputs were collected throughout the crop period, starting from seed treatment to measuring the final yield. The collected data's related to approximation of the impact of SRI methods on crop yield, use of harvester machineries, effective handling of weeding equipment (like cono-weeder and power weeder) over the conventional paddy cultivation practices.

Result and Discussion

Totally 176.5 acre was surveyed during April-May2009 among the farmers cultivating paddy in selected areas of anaivarai sub basin. From the survey it was observed that most of the SRI farmers using farm equipment such as., nursery preparation implements, drum seeder, transplanter, harvester and practicing effective handling of water for irrigation for reduce excess application of water.

Machinery involvement in SRI practices

Usage percentage of tractor 70 per cent and power tiller 30 per cent for field preparation by SRI Farmer in Aanaivarai- sub basin as shown in [Fig-1]. The tractors and power tillers are used for all agricultural practices such as ploughing, puddling and implements are attached according to the agricultural use. Further they are hired in local region which adds to the income. In the study area, farmers were used tractor mostly for tillage practices. Puddling is the important operation in paddy cultivation for to create impervious layer. Farmers mostly used power tiller for puddling operation compared to tractor.

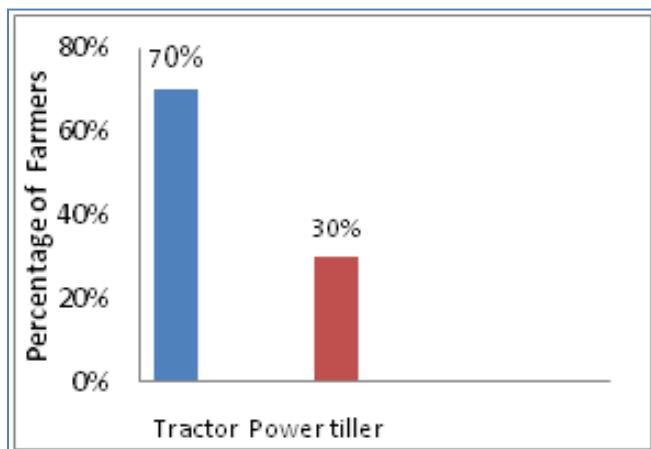


Fig-1 Utilization percentage of tractor and power tiller in SRI

According to SRI method, farmers must plant one seedling per hill. But there is significant variations found during the survey which is shown in [Fig-2]. Farmers still doubt on plantation part of the SRI method that's why they sow two, three and four seedlings per hill. Weeds are major problem of rice cultivation, to reduce effect of weeds the importance of spacing is given in this SRI method of rice cultivation (25 x 25 cm). In conventional paddy cultivation, the flooding is being practiced to suppress the weed growth up to 45–50 DAP. But in SRI cultivation, weeds are incorporated into the soil by push and pull movement of mechanical weeder which helps to improve the organic matter in the soil. Mechanical weeding operation facilitates the process of aeration in the soil and provides soil churning effect and pruning the older roots facilitating plants to produce new roots which help in the uptake of enhanced nutrients [15] favors root growth. But number of times weeding operation done also effects the yield of the cultivation. For weeding, farmers used manually operated conoweede and rotary weeder which reduce lack of agricultural labours when compared to normal hand weeding. Normally farmers are using combine harvester for harvesting the rice due to labour shortage and reduce work burden compared to manual harvesting. Usage of combine harvester was 77 per cent which is higher than manual harvesting method as depicted in [Fig-4].

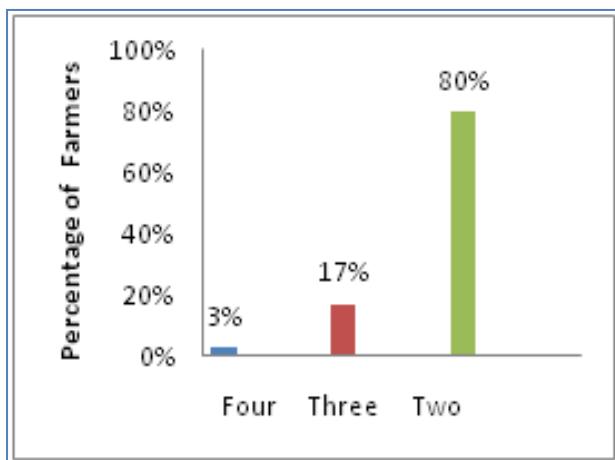


Fig-2 Number of seedlings per hill in SRI area

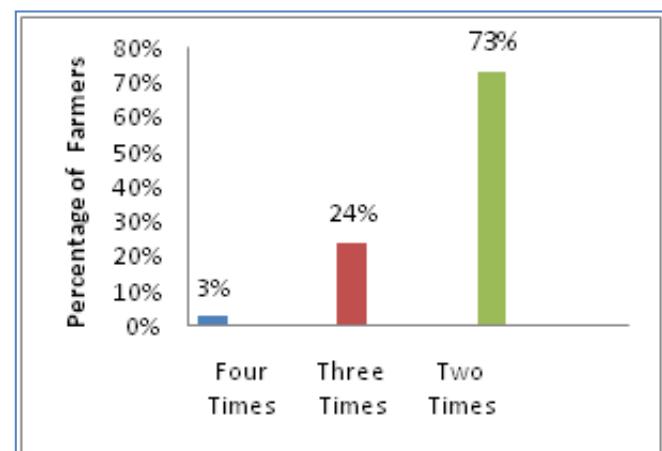


Fig-3 Number of Weeding in SRI Practices

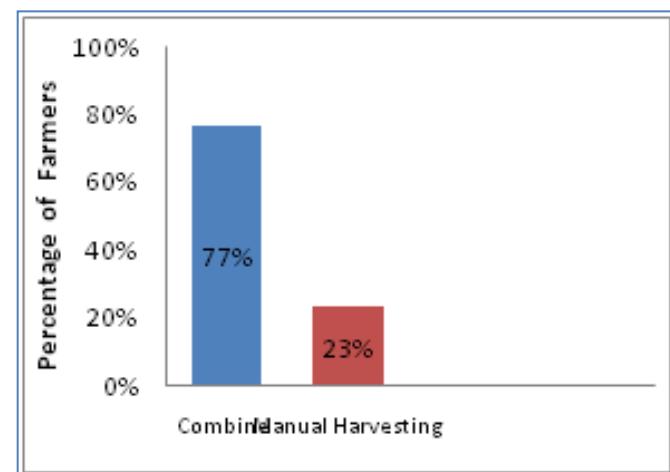


Fig-4 Paddy harvesting method in SRI practices

Increasing Yield per Acre

The efficient utilization of resources and less inter-and-intra space competition under SRI management, which may be responsible for yield attributes of rice and consequently increased yield. Therefore, SRI farmers reported yield varies from 7 to 41 per cent during the SRI cultivation practices as shown in [Fig-5] when compared to the conventional method of cultivation. Obtained field result similarly from the field observations of [2] higher yield and cost benefits in SRI practice induces the 35 per cent of conventional farmer shifting their traditional farming practice into SRI cultivation practices in Aanaivarai- sub basin as shown in [Fig-5].

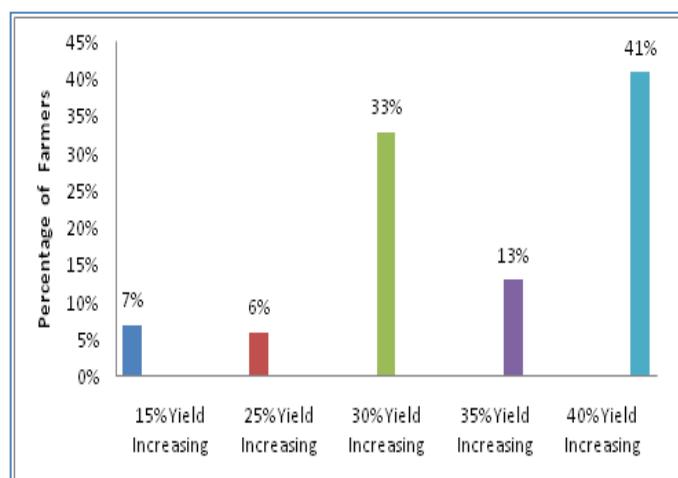


Fig-5 Crop Yield varies through SRI cultivation practices

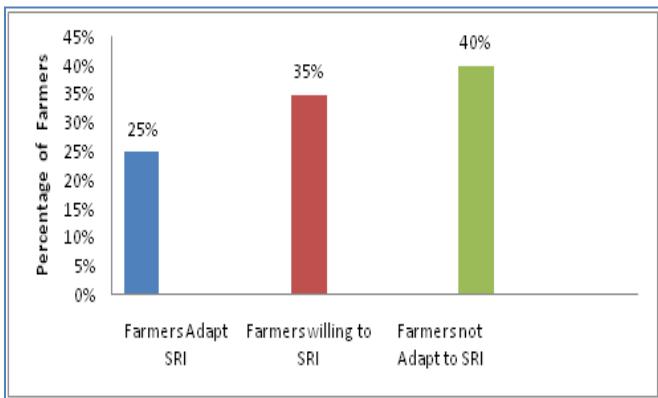


Fig-6 Interest of farmer to shift conventional into SRI cultivation practices

Conclusion

The adoption of SRI cultivation was only 25 per cent and 35 percent farmer willing to implement SRI per cent and remaining 45 percent formers are not willing do SRI cultivation in Anaivarai villages Ariyalur District, Tamil Nadu. Above result similar to [5] he reported only 20 per cent of adopters of SRI take to all core practices of SRI and the balance per cent are either partial or low adopters. Hence, government has to concentration more in all paddy cultivation area to motivate farmer to adopt SRI practices for effective use water, reduce seeding cost, increase farm equipment usage and concurrently increase economic status of farmer.

Application of research: This study gives idea about the lack of mechanization for paddy cultivation.

Hence, more concentration needed for all paddy cultivation area to motivate farmer to adopt SRI technique.

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Author Contributions: All author equally contributed.

Abbreviations:

SRI: System of Rice Intensification

IAMWARM: Irrigated Agriculture Modernization and Water Bodies Restoration and Management.

DAP: Days after planting.

Conflict of Interest: None declared

References

- [1] ICRISAT-WWF Project (2009) *SRI Fact Sheet, International Crops Research Institute for Semi-Arid Tropics. India.*
- [2] Pandian B.J., Rajkumar D. and Chellamuthu (2011) *System of Rice Intensification: A Synthesis of Scientific Experiments and Experiences. System of Rice Intensification.*
- [3] Ravichandran V.K., Nayar V. and Prakash K.C. (2015) *Irrigat Drainage Sys. Eng.*, 4, 137.
- [4] San-oh Y., Sugiyama T., Yoshita D., Ookawa T. and Hirasawa T. (2006) *Fields Crops Res.*, 96, 113-124.
- [5] Zhao L.M., Wu L.H., Li Y.S., Lu X.H. and Zhu D.F. (2009) *Exp. Agric.*, 45, 275-286.