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# IMPACT OF SRI ON FARMING OUTCOMES: OPPORTUNITIES AND CONSTRAINTS OF FARMERS IN ODISHA INDIA

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## ABSTRACT

The System of Rice Intensification (SRI) contributes a set of innovative rice farming practices aimed at increasing yield while conserving water and reducing quality inputs. This study was conducted in Ganjam district of Odisha, where SRI adoption has paramount significant among rice farmers. This research employed an ex-post facto research design, with data collected from 80 farmers across four villages using a pre-tested structured interview schedule. In the study analysed following key metrics included yield improvement, water efficiency, input reduction, and the socio-economic impact of SRI on smallholders. The results showed that SRI provides substantial benefits in terms of yield increase, with 60-80% higher grain production and 50-75% more straw yield, coupled with water savings of 25-50%. Additionally, SRI practices reduced the need for seeds, chemical fertilizers, and pesticides, enhancing the system's sustainability. The study also highlighted improved grain quality, quicker crop ripening, and better food security. Most respondents agreed that SRI reduced long-term labour requirements, lowered production costs, and improved resilience to drought conditions. However, the adoption of SRI is constrained by several factors, including labour intensity, the need for precise management, and limited farm mechanization. Farmers practicing SRI reported various challenges across agronomic, technological, economic, social, environmental, infrastructural, and market-related dimensions. Notably, agronomic constraints such as erratic rainfall, improper nursery management, and weed infestation were prevalent. Technological hurdles like lack of skilled labour and tools (e.g., cono-weeder) were also cited as major barriers. Economically, the absence of reasonable support prices, high labour costs, and non-availability of credit were prominent constraints in the study area. Socially, low awareness and hesitation among family members to adopt SRI created challenges, while environmental issues such as inadequate rainfall and cyclones exacerbated paramount difficulties. The inadequate infrastructure gaps, including the absence of storage facilities and agro-services, further hindered the system's efficacy. The findings also expressed market-related constraints, including low produce prices and the lack of post-harvest value addition, also limited the farmers' profitability. The study concludes that while SRI holds potential for sustainable rice farming, its wider adoption requires addressing labour and farm mechanization constraints, which leads to improving access to resources, and providing targeted training and support. The tailored-made SRI to fit diverse socio-economic and agro-ecological contexts will be crucial in realizing its benefits more broadly, particularly for smallholder farmers in resource-limited ecological environments.
***Keywords*:** System of Rice Intensification (SRI), Yield improvement, Water efficiency, Sustainable agriculture, Smallholder farmers.

## Introduction

The System of Rice Intensification (SRI) is an innovative method of rice cultivation has gained paramount global attention due to its potential to increase yield, which reducing water and input requirements (Uphoff *et al*., 2013). The idea has been developed originally developed in Madagascar during the 1980s, SRI promoted good agricultural practices such as planting younger seedlings, wider spacing, alternate wetting and drying of fields, and the use of organic fertilizers (Kassam *et al*., 2011). These agronomic shifts aim to enhance the productivity of rice cultivation by improving root growth, reducing water stress, and encouraging a healthy soil ecosystem (Thakur *et al*., 2016).

The concept of SRI offers a sustainable solution for smallholder farmers, particularly in regions facing water scarcity and high input cost. Studies have reported yield increases ranging from 20-50% with water savings of up to 30% under SRI compared to conventional practices (Anitha & Chellappan, 2018; Kabir & Uphoff, 2020). Additionally, this system also promotes ecological resilience by reduced the necessity on reliance on chemical fertilizers and pesticides, which aligns with the global push for climate-smart agriculture (Chapagain & Yamaji, 2010; Mishra *et al*., 2021).

The adoption of SRI is not without challenges. Farmers often cite labour intensiveness and the need for precise management as significant barriers to its wider implementation (Amudhan, 2019). The success of SRI depends heavily on local conditions such as soil type, climate and access to labour, making its benefits highly context-specific (Barah, 2012; Haripriya *et al*., 2020). Moreover, mechanization of SRI remains limited, which discourages its use in areas where traditional rice farming methods are well established (Patra & Babu, 2017).

This paper explores the pros and cons of SRI from the perspective of farmers, assessing the system's impact on productivity, resource use efficiency, labour dynamics, and socio-economic factors. By analysing both the opportunities and constraints associated with SRI, this review aims to provide a balanced view of its practical implications for rice farmers, especially in resource-constrained environments.

## Materials and Method

This study was carried out purposively in Ganjam district of Odisha, because Ganjam is one of the major rice production districts in Odisha, where many farmers practicing SRI systems. Therefore, it provided ample opportunity to generate the relevant data from the farmers regarding impact of System of Rice Intensification (SRI) on farming, based outcomes with opportunities and constraints of farmers in Ganjam district of Odisha. Totally, two blocks from Ganjam districts were selected randomly for the study, which were Digapahandi and Sanakhemundi. From each block, two villages, and total of four villages namely, Bhismagiri and Phasibanda from Digapahandi block and Pudamari and Pattapur from Sanakhemundi blocks were selected through simple random sampling method for the conduct of study. Further, farmers are primary respondents, a total list of farm families practising SRI on a regular basis was prepared from each selected village. Thereafter, a probability proportionate sample of farmers from each village was selected randomly to choose a total of 80 respondents of the study area respondents for primary data collection through personal interview. The ex- post facto research design was adopted for the study as the investigator has no scope to manipulate the independent variables, because these have already occurred.

Analysis of technological intervention and rate of adoption was employed with five-point continuum scale was used to record the farmers' responses on each intervention that was ranging from very highly effective (5) to very low effective (1). The data were collected with the help of pre-tested interview schedule used for the study. Data were collected in four villages of Ganjam district covering 80 farmers cultivating rice with SRI method. The main statistical techniques and tools used were frequency and percentage, mean, standard deviation, range, co-efficient of variation, correlation coefficient, and multiple regression are used and interpretations were made.

## Results and Discussion

### Impact of SRI on Farming

SRI is a climate smart, yield increasing, rice cultivation system that is being utilized by majority of the farmers in over 55 countries. SRI is best understood as set of agronomic principles rather than a typical kind of agricultural technology. It has a wide range of impact it enabled farmers to use their available resources more productively, get higher yield and more robust crops. Here in present study, impact of SRI on farming has been portrayed. The impact was analysed by taking a scale containing 13 impact attributes, which were measured on the basis of response obtained from 80 randomly selected rice farmers using 5-point continuum i.e. strongly disagree (1), disagree (2), undecided (3), agree (4) and strongly agree (5). The perceived impact of SRI on farming is presented in Table -1.

**Table 1:** Distribution of the respondents based on perceived impact of SRI on farming

| Impact of SRI on farming | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|
| | SD | D | U | A | SA | |
| **Positive yield attributes:** 60-80% higher grain yield and 50-75% straw yield | 2.50 | - | - | 42.50 | 55.00 | 4.48 (0.75) |
| **Low water requirement of paddy:** Reduction in water requirement by 25-50% | - | - | - | 68.75 | 31.25 | 4.31 (0.47) |
| **Reduces pressure on land:** Higher productivity (40-80%) | - | - | 1.25 | 55.00 | 43.75 | 4.43 (0.52) |
| **Low seed requirement:** Only 5-8 kg/ha seed required, compared to 80 kg in traditional system | - | - | 7.50 | 65.00 | 27.50 | 4.2 (0.56) |
| **Low inorganic fertilizer use:** Dependence on green manure reduces use of inorganic fertilizers | - | - | 12.50 | 62.50 | 25.00 | 4.13 (0.60) |
| **Low pesticide use:** Owing to low plant density, more penetration of sunlight and aeration of the field results in low incidences of disease and pests | - | - | 12.50 | 60.00 | 27.50 | 4.15 (0.62) |
| **Greenhouse gas emission:** Methane gas emission is less because of lack of standing water on the field | - | - | 30.00 | 51.25 | 18.75 | 3.89 (0.69) |
| **Improved grain quality:** More grain & less chaff, so higher milling out-turn from paddy | - | - | 21.25 | 58.75 | 20.00 | 3.99 (0.65) |
| **Grain ripening is quicker:** Grain ripening is 7-10 days sooner | - | - | 28.75 | 45.00 | 26.25 | 3.98 (0.75) |
| **Improved food security:** Higher productivity from small holdings | - | - | 23.75 | 48.75 | 27.50 | 4.04 (0.72) |
| **Low labour requirement:** In long run, labour requirements are reduced | - | - | 16.25 | 55.00 | 28.75 | 4.13 (0.66) |
| **Reduced production costs:** With increased output and reduced costs (10-20%), farmers' net income is likely to increase | - | - | 15.00 | 60.00 | 25.00 | 4.1 (0.63) |
| **Better drought coping:** Owing to low seed rate, staggered nursery is feasible in the event of unfavourable monsoon; deeper root systems give crop more resilience | - | - | 28.75 | 52.50 | 18.75 | 3.9 (0.69) |
| **Overall perceived impact (%)** | | | | | | 82.62 (4.56) |

**SD:** strongly disagree, **D**: disagree, **U:** undecided, **A:** agree, **SA**: strongly agree

From Table 1 revealed that, majority of the respondents (55%) agreed strongly with the positive yield attributes of SRI in terms of 60-80% higher grain yield and 50-75% straw yield; while 42.50% respondents also agreed to it. Only few respondents (2.50%) strongly disagreed with this. A reduction of water requirement by 25-50% in SRI was strongly agreed by 68.75% and agreed by 31.25% respondents. In terms of reducing pressure on land by higher productivity in SRI is agreed by majority of the respondents (55% agreed, 43.75% strongly agreed). In regard to the lower seed requirement in SRI as compare to traditional system 65% and 27.50% respondents agreed and strongly agreed, respectively; while 7.50% of the farmers were undecided with this attribute of SRI. Low inorganic fertiliser uses due to application of farm yard manure and/or green manure and low pesticide use due to low incidence of diseases and pest was agreed by majority of the respondents (>60% agreed, >25% strongly agreed); few farmers were undecided. Low emission of greenhouse gas (methane gas) due to lack of standing water on the field in SRI is one of the positive impacts in the context of climate change issues, which was agreed by 51.25% farmers and strongly agreed by 18.75% farmers, while 30% farmers couldn't be sure of this fact thus remain undecided. In terms of improved grain quality with higher milling out turn from paddy in SRI, 20% respondents strongly agreed, 58.75% respondents agreed, 21.25% farmers couldn't decide and with the statement. Most of the respondents strongly agreed and agreed (26.25% and 45%) with the fact of quicker grain ripening (7-10 days prior) in SRI; 28.75% remained undecided on this impact of SRI. Looking at the impact on improved food security due to higher productivity 27.50% strongly agreed and 48.75%

respondents agreed, but 23.75% respondents couldn't decide about this. It was also observed that 55% of farmers agreed, 23% strongly agreed and 16.25% farmers couldn't decide regarding the lower labour requirement in SRI. Majority of the respondents (60% of the respondents agreed, 25% strongly agreed) opined that reduced production cost in SRI helped in increase of farmer's income. About 18.75%, 52.50%, and 28.75% of the respondents strongly agreed, agreed, and remained undecided, respectively, with a view of SRI providing better drought coping, the statement.

According to the present study, majority of the respondents strongly agreed with positive yield attributes obtained. Majority of the respondents agreed on lower water requirements on field, reduced pressure on land, lower seed requirements, inorganic fertilizer use, pesticide use, greenhouse gas emission, improved grain quality, food security, quicker ripening of grain, reduced production cost, lower labour requirements and better drought coping. The similar finding is reported by Zhao, *et al*., (2009), who observed that SRI continuously provided higher yields in various agro ecosystems with less input such as water, seeds or fertilizer. Johnson and Vijayaragavan (2011) also reported that SRI has more relative advantage than conventional method. Majority of farmers felt SRI is a low cost and high yielding technology in rice production. Wu *et al*., (2015) in their study found that SRI method can reduce requirements for irrigation water and seed, which will lower farmer's costs of production and increase their net income.

## Constraints Experienced by the Farmers Practicing SRI

The constraints were delineated as perceived by the farmers adopted SRI with the help of semi - structured schedule on the basis of their responses on difficulty due to each constraint on a five-point continuum scale ranging from very low (1) to very high (5). Seven categories of constraints were identified such as agronomical constraints, technological constraints, economical constraints, social constraints, environmental constraints, infrastructural constraints and market related constraints.

The various agronomical constraints faced by the farmers adopted SRI are presented in Table-2 majority (62.50%) of the respondent-farmers agreed improper nursery management as a high-level constraint. Similarly, most of the respondents perceived the problem of weed infestation, dying of seedling in early stage, erratic rainfall, decaying of seedling in heavy rainfall, lack of assured irrigation and no/low apply of recommended organic manure and lack of alternate drying and wetting. Mean difficulty score/ severity score of each constraint as well as index value indicates difficulties faced by farmers in practicing SRI.

Technological constraints used to hamper the SRI practices and it cause difficulties to the SRI farmers. It is evident from the Table 3 shows that, 65% and rest 35% of the respondent-farmers perceived the lack of skilled labour in transplanting at high and very high level, respectively. While other sampled farmers have perceived other technical constraints like, lack of knowledge on the use of marker, drudgery in using cono-weeder, non-availability of cono-weeder and marker, lack of knowledge on application of pesticide based on ETL, lack of knowledge on the use of light traps are perceived by the respondents at a higher difficulty level due to lack of technical know-how and high cost. The mean perception scores as worked out as index values depicted the existence of technological constraints.

The economic constraints faced by the farmers adopting SRI practices (Table -4) revealed that majority (57.50% and 27.50%) of the respondents agreed to lack of reasonable support price as a constraint prevailing at high to very high level. While, 56.25% and 23.75% of the respondents perceived the problem of lack of ownership of land at high and very high level, respectively. The total non-availability of credit was perceived high and very high by 55% and 35% of sampled farmers, respectively. Problem in purchasing machinery was perceived by 42.50% of respondents highly and 31.25% respondents at very high level. All of the farmers mentioned high cost of labour, lack of subsidy for inputs, non-availability of credit as dominant constraints.

Social constraints faced by the farmers are given in Table 5. Social constraints hamper SRI practices and cause difficulties to the farmers. It is evident that 60% of the respondents perceived lack of awareness of SRI practices, traditionally adopted rice cultivation practices, low adoption by people that have acted as a barrier to adoption of SRI. Besides, hesitation of family members as the neighbours are not following SRI method found to be another social constraint faced by the farmers. Both these constraints perceived high and very high by majority of the respondents that resulted in higher index values.

Environmental constraints have also caused difficulties to farmers. It is evident from the Table 6 that majority of the respondents perceived (53.75% high and 38.75% very high) inadequate rainfall as major constraint. While 45% and 51% farmers mentioned occurrence of cyclone as a high and very high-level constraint. Extreme temperature was perceived high and very high-level constraint by 43.75% and 48.75%, respectively. Index values are found to be very high for all these constraints.

The various infrastructural constraints faced by the farmers in practicing SRI are presented in Table 7. Majority (62.50%) of the farmers reported high level of difficulty due to lack of storage warehouse. While, 56.25% and 32.50% of the farmers perceived the problem of low-quality packaging at high and very high level. Lack of agro service system was perceived by 61.25% and 17.50% of sampled of farmers as a high and very high-level constraint, respectively. The unplanned irrigation channel and non-availability of electric pump and lack of soil testing laboratory were perceived another two major infrastructural constraints by most of the respondents.

The various market related constraints faced by the farmers in practicing SRI are presented in Table 8. About 67.50% of the farmers agreed both low price of farm produce and lack of market facility causing high level of difficulty. While 41.25% and 53.75% respondents opined non availability of pesticide and insecticides on time as a high and very high-level constraint, respectively. Non availability of fertilizer/bio fertilizer on time was perceived by 57.50% and 30% of sampled farmers as a high and very high-level constraint. while 53.75% and 27.50% farmers faced high and very high-level difficulties due to lack of post-harvest value addition.

**Table 2:** Agronomical constraints experienced by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Erratic rainfall | - | - | 1.25 | 61.25 | 37.50 | 4.36 (0.51) |
| 2 | Assured water not available for irrigation | - | - | 2.50 | 58.75 | 38.75 | 4.36 (0.53) |
| 3 | Improper nursery management | - | - | 2.50 | 62.50 | 35.00 | 4.33 (0.52) |
| 4 | Weed infestation is more | - | 2.50 | - | 61.25 | 36.25 | 4.31 (0.61) |
| 5 | Low/no application of recommended organic manure | - | - | 10.00 | 58.75 | 31.25 | 4.21 (0.61) |
| 6 | Seedling died in early stage | - | - | 18.75 | 61.25 | 20.00 | 4.01 (0.63) |
| 7 | Seedling decayed in heavy rainfall | - | 3.75 | 23.75 | 60.00 | 12.50 | 3.81 (0.70) |
| 8 | Lack of alternate drying and wetting | - | 1.25 | 25.00 | 53.75 | 20.00 | 3.93 (0.71) |
| **Overall perception** | | | | | | | **3.93 (0.71)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 3:** Technological constraints experienced by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Lack of knowledge on the use of marker | - | 2.50 | 7.50 | 58.75 | 31.25 | 4.19 (0.68) |
| 2 | Drudgery in using cono-weeder | - | 1.25 | 3.75 | 56.25 | 38.75 | 4.33 (0.61) |
| 3 | Lack of skilled labour in transplanting | - | - | - | 65.00 | 35.00 | 4.35 (0.48) |
| 4 | Non-availability of cono weeder and marker | - | - | 16.25 | 56.25 | 27.50 | 4.11 (0.66) |
| 5 | Lack of knowledge on application of pesticide based on ETL | - | 7.50 | 15.00 | 51.25 | 26.25 | 3.96 (0.85) |
| 6 | Lack of knowledge on the use of light traps | | 2.50 | 36.25 | 41.25 | 20.00 | 3.79 (0.79) |
| **Overall perception** | | | | | | | **4.12(0.33)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 4:** Economic constraints perceived by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Lack of reasonable support price | - | 1.25 | 13.75 | 57.50 | 27.50 | 4.11 (0.67) |
| 2 | Non availability of credit | - | 1.25 | 8.75 | 55.00 | 35.00 | 4.24 (0.66) |
| 3 | High cost of labour | - | - | 10.00 | 52.50 | 37.50 | 4.28 (0.64) |
| 4 | Lack of subsidy for inputs | - | - | 8.75 | 50.00 | 41.25 | 4.33 (0.63) |
| 5 | Lack of ownership of land | - | - | 20.00 | 56.25 | 23.75 | 4.04 (0.66) |
| 6 | Problem in purchasing machinery | - | 7.50 | 18.75 | 42.50 | 31.25 | 3.98 (0.90) |
| **Overall perception** | | | | | | | **4.16 (0.34)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 5:** Social constraints experienced by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Lack of awareness, traditionally adopted practices, low adoption by people | - | 1.25 | 5.00 | 60.00 | 33.75 | **4.26 (0.61)** |
| 2 | Hesitation of family members as the neighbours are not following SRI method | - | - | 5.00 | 56.25 | 38.75 | **4.34 (0.57)** |
| **Overall perception** | | | | | | | **4.3 (0.42)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 6:** Environmental constraints perceived by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Inadequate rainfall | - | - | 6.25 | 53.75 | 38.75 | 4.33 (0.59) |
| 2 | Occurrence of cyclone | - | 1.25 | 2.50 | 45.00 | 51.25 | 4.46 (0.62) |
| 3 | Extreme temperature | - | 1.25 | 6.25 | 43.75 | 48.75 | 4.40 (0.67) |
| **Overall perception** | | | | | | | **4.40 (0.44)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 7:** Infrastructural constraints perceived by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Lack of soil testing laboratory | - | - | 7.50 | 53.75 | 38.75 | 4.31 (0.61) |
| 2 | Unplanned irrigation channel and non-availability of electric pump | - | - | 3.75 | 57.50 | 38.75 | 4.35 (0.55) |
| 3 | Lack of agro service system | - | 1.25 | 20.00 | 61.25 | 17.50 | 3.95 (0.65) |
| 4 | Lack of storage warehouse | - | 10.00 | 7.50 | 62.50 | 20.00 | 3.93 (0.82) |
| 5 | Low quality packaging | - | 1.25 | 10.00 | 56.25 | 32.50 | 4.2 (0.66) |
| **Overall perception** | | | | | | | **4.15 (0.37)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

**Table 8:** Market related constraints perceived by respondents

| Sl. No. | Constraints | Frequency (%) | | | | | Mean score (SD) |
|---|---|---|---|---|---|---|---|
| | | VL | L | M | H | VH | |
| 1 | Non availability of fertilizer/bio fertilizer on time | - | 1.25 | 11.25 | 57.50 | 30.00 | 4.16 (0.66) |
| 2 | Non availability of pesticide and insecticides on time | - | - | 5.00 | 41.25 | 53.75 | 4.49 (0.60) |
| 3 | Low price of farm produce | - | 2.50 | 3.75 | 67.50 | 26.25 | 4.18 (0.61) |
| 4 | Lack of market facility | - | 1.25 | 15.00 | 67.50 | 16.25 | 3.99 (0.61) |
| 5 | Lack of post-harvest value addition | - | 3.75 | 15.00 | 53.75 | 27.50 | 4.05 (0.76) |
| **Overall perception** | | | | | | | **4.17 (0.38)** |

**VL:** very low, **L**: low, **M:** medium, **H:** high, **VH**: very high

The study results found that majority of farmers agreed as nursery management, weed infestation and erratic rainfall as agronomical constraints; while in case of the technological constraints, lack of skilled labour in transplanting, and lack of use of marker are found as major constraints. Lack of reasonable support price, lack of ownership of land, shortage of labour found as major economical constraints. Social constraints are lack of awareness of SRI practices and traditional rice cultivation practices acted as major problem. Coming to environmental constraints, inadequate rainfall happened to be major problem faced by farmers. Lack of storage ware house and lack of agro service system are found as major infrastructural constraints faced by the farmers. Low price of farm produce found as major problem amongst market related constraints.

Findings of the study reported by Sivanagaraju (2006), where high labour requirement is observed to be the major constraint for SRI method followed by weed infestation. Minea Mao *et al* (2008) found seven important problems like low soil fertility, shortage of labour and high rates of labour, lack of irrigation system, lack of organic fertilizers, lack of technique for diseases and pest control, natural disaster, and difficult management of paddy field. According to Biswas and

Nath (2013), timely weed management of the crop, intensive care required at seedling stage, more labour needed at the time of cultivation practices are the constraints perceived by more than 85%t of the farmers in the large-scale adoption of SRI technology. Reddy and Shenoy (2013) found that the farmers expressed difficulty in adopting SRI on two counts, viz., labour scarcity and weed menace. These constraints have to be addressed to enable wider adoption of SRI technology by a greater number of rice cultivators. Krishna (2016) indicated that farmers have developed positive attitude towards SRI technology. However, majority of the farmers feel that many of the operations of SRI method are labour intensive and time consuming. More than 80% of the farmers expressed the need for development of more efficient equipment for raising nursery, levelling and weeding. They felt the need for training agricultural labourers in SRI techniques. Farmers expressed the need for season long contact and support of extension staff with information on irrigation technology and integrated crop management.

## Conclusion

The System of Rice Intensification (SRI) offers a promising approach to enhancing rice productivity and promoting sustainable agriculture, particularly in resource-constrained settings. From the farmers' perspective, SRI presents distinct advantages, such as increased yields, reduced water use, and lower dependence on chemical inputs. These benefits are particularly relevant for smallholder farmers facing challenges like water scarcity and rising input costs. However, the labour-intensive nature of SRI, coupled with the need for precise management and limited mechanization, poses significant challenges to its broader adoption. Farmers in regions with limited access to labour or where traditional practices are deeply entrenched may find it difficult to fully implement SRI.

This SRI holds potential as a viable alternative to conventional rice farming, its success is contingent on several factors, including local farming conditions, access to resources, and adequate training and support for farmers. Addressing the constraints of labour intensity and providing mechanized options could improve adoption rates. Future more, the efforts should focus on refining SRI practices to make them more adaptable to varying socio-economic and diverse agro-ecological contexts, ensures that its benefits can be realized more widely among rice-growing communities.

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