



Proceedings of
Second National Symposium
on

System of Rice Intensification (SRI) in India - Progress and Prospects

3rd - 5th October 2007

Venue

State Institute of Public Administration
and Rural Development (SIPARD)
Agartala - 799 003, Tripura, India



Partners

Department of Agriculture, Govt. of Tripura
Directorate of Rice Research
Central Rice Research Institute
Directorate of Rice Development
National Bank for Agriculture and Rural Development
Acharya N.G. Ranga Agricultural University
Sir Dorabji Tata Trust (SDTT)
World Wide Fund for Nature (WWF)



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Tata Trust
SDTT**



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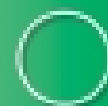
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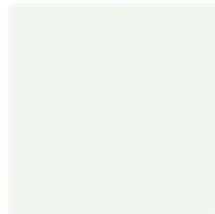
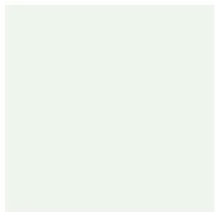
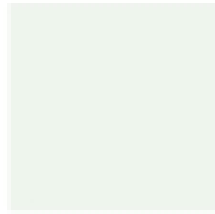
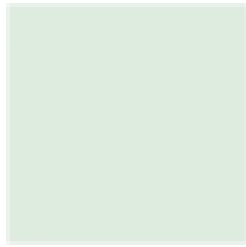
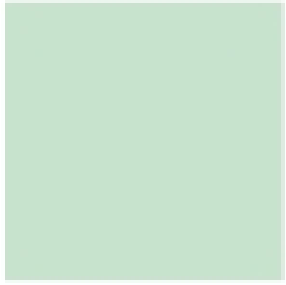
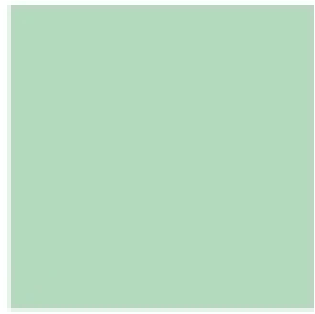
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ABBREVIATIONS

SRI	System of Rice Intensification
AICRIP	All India Coordinated Rice Improvement Project
ANGRAU	Acharya NG Ranga Agricultural University
ATMA	Agricultural Technology Management Agency
CIIFAD	Cornell International Institute for Food, Agriculture and Development
CRRI	Central Rice Research Institute
DAATTC	District Agricultural Advisory and Transfer of Technology Centre
DDA	Deputy Director Agriculture
DOA	Department of Agriculture
DRD	Directorate of Rice Development
DRR	Directorate of Rice Research
ERC	Existing Rice Cultivation
FAO	Food and Agriculture Organization
FFS	Farmer Field Schools
FLD	Front Line Demonstrations
ICAR	Indian Council of Agricultural Research
ICM	Integrated Crop Management
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IGAU	Indira Gandhi Agricultural University
IPM	Integrated Pest Management
JDA	Joint Director Agriculture
KVK	Krishi Vigyan Kendra
KVKEM Technology	Krishi Vigyan Kendra Effective Micro-organisms Technology
NABARD	National Bank for Agriculture and Rural Development
NEHC	North Eastern Hill Council



NGO	Non-Government Organisation
NFSM	National Food Security Mission
PETRRRA	Poverty Elimination Through Rice Research Assistance
PRI	Panchayat Raj Institutions
SARR	Society for Advancement of Rice Research
SARS	State Agricultural Research Station
SAU	State Agricultural University
SDTT	Sir Dorabji Tata Trust
TNAU	Tamil Nadu Agricultural University
TRRI	Tamilnadu Rice Research Institute
UPCAR	Uttar Pradesh Council of Agricultural Research
VLW	Village Level Worker
WASSAN	Watershed Support Services and Activities Network
WWF	World Wide Fund for Nature
XIM	Xavier Institute of Management



Background

Rice is the lifeline for millions of people in the world, particularly in developing countries. It is the main cereal for a majority of the population in India. To meet the growing demand for rice with increasing population and incomes, rice cultivation is expanding to new areas, including some uplands where it is not traditionally grown.

Rice is a water intensive crop. More than 75 percent of the country's ground and surface water are being used for agriculture, of which rice consumes 70 percent. Water is the single most crucial input in rice cultivation, with each kilogram of irrigated rice produced guzzling 3000-5000 litres. In spite of providing assured irrigation (50 percent of the area), use of pest-resistant high-yielding varieties and high inputs of fertilisers and pesticides, rice yields in India are plateauing.

Water for agriculture threatens to become scarcer in the future with increasingly competing demands from the domestic and industrial sectors. Hence, India needs to invest in improving water productivity which will lead to fewer water conflicts and on adopting options with potential to produce more rice with less water. This holds the key to sustainable water and food security. Reducing water inputs into agriculture may also lead to the regeneration of rivers and estuaries.

The System of Rice Intensification, known by its acronym SRI, is gaining popularity among paddy farmers in several states in India. The method has the potential to improve the productivity of land, capital, water and labor simultaneously. Developed in Madagascar in the 1980s, the system has been tried out successfully in 25 countries across the world. SRI is a system of growing rice, some principles of which are radically different from traditional ways of growing rice. SRI involves carefully planting single young seedlings compared to the conventional method of planting multiple mature seedlings from the nursery. In SRI, rice plants are more widely spaced and do not depend on continuous flooding of fields. Fewer seeds and chemical inputs are used. The system promotes soil biotic activities in and around the root zone, through liberal applications of compost and weeding with a rotating hoe that incorporates the weeds and aerates the soil. These practices lead to enhanced yields and considerable savings in terms of inputs, especially water.

The System of Rice Intensification

The System of Rice Intensification is a combination of several practices that include changes in nursery management, time of transplanting, water and weed management. Though the fundamental practices remain more or less the same, SRI emphasizes the altering of certain agronomic practices of conventional rice cultivation. However,

farmers have modified some of the elements of SRI depending on soil, climate and other social conditions. The system provides ample scope for innovation.

It is known that rice plants do well when young seedlings are transplanted carefully with wider spacing, helping their roots grow larger on soil that is kept well aerated with abundant and diverse soil micro-organisms. SRI has five main components, ie, nursery management, soil fertility management, planting method, weed control and water (irrigation) management. Several field practices have been developed around these components. Of them, the key cultural practices followed in most cases are: soil nutrient management through adequate farmyard manure application, transplanting young seedlings (8 to 12 days old), transplanting with soil clump (along with seed), transplanting at wider spacing (25 X 25 cm), regular weeding with weeders and protective irrigation to keep soil wet without flooding. Rice grown by following these practices develops about 30–80 tillers with huge panicles and well-filled spikelets with higher grain weight as well as a larger root system. Hence yields are reported to be higher under SRI. (For more information visit www.sri-india.net).

The First National Symposium on SRI

While the scientific community is still debating, collecting data and scientifically validating SRI's performance, interestingly civil society organizations and extension functionaries are popularizing the method. SRI is today primarily driven by the successful farmers who took initial risks. The visual impact of practices in farmers' fields is driving SRI's adoption by farmers in states like Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, Chhattisgarh, West Bengal, Assam, and Tripura. Farmer enthusiasm and adoption results have led many research institutes across the country to begin trials on various aspects of SRI.

Keeping this in view, the first National Symposium on SRI was organized in



Inauguration of the First National Symposium on SRI

November 2006 at the Acharya NG Ranga Agricultural University (ANGRAU) in Andhra Pradesh in collaboration with the Directorate of Rice Research (DRR), Hyderabad, and the Society for Advancement of Rice Research (SARR), Hyderabad. The event brought together about 200 stakeholders representing scientists, agricultural workers, policy makers, civil society, farmers and critics of SRI

from across the country. Sponsored by World Wide Fund for Nature (WWF)-ICRISAT Dialogue Project, the two-day deliberations led to the sharing of successful experiences, concerns about constraints, farmer innovations, and identify research priorities and policy directions to enhance SRI adoption and scaling-up to increase rice production and improve the livelihoods of the rural poor . (The report is available at www.sri-india.net).

The Second National Symposium on SRI

Encouraged by the overwhelming response to the first symposium, the second national symposium on SRI was organized from 3-5 October 2007 at Agartala in Tripura. Tripura is a tiny state (10,491 sq km) in northeast India. SRI was introduced in Tripura in 2001 and is now adopted on about 14,000 ha (about 8% of the total paddy area). What is remarkable is that SRI methods have been adopted in large contiguous areas of 30-50 ha covering groups of 20-50 farmers. The energetic commitment of field staff and strong political support have enabled the swifter spread of SRI. Tripura was chosen to host the symposium in order to serve as a motivation for other states to emulate.

The symposium was jointly organized by the Department of Agriculture of the Government of Tripura; the Directorate of Rice Research (DRR), Hyderabad; the Central Rice Research Institute (CRRI), Cuttack; the Directorate of Rice Development (DRD), Patna; ANGRAU, Hyderabad; the National Bank for Agriculture and Rural Development (NABARD), Mumbai; Sir Dorjee Tata Trust (SDTT) and the WWF-ICRISAT Dialogue Project based at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru.

The main objectives of the symposium were:

- To provide a common platform for different stakeholders such as policy makers, researchers, civil society, line departments, extension agencies and farmers to share their experience on SRI
- To identify the constraints and opportunities in SRI based on practical experiences, to facilitate its further expansion
- To deliberate on policy and institutional interventions required to increase the area under rice cultivation with SRI and to prepare a road map to achieve the targeted goals.

A half-day field visit to SRI fields in the state followed by discussions at these locations were the unique features of the three-day symposium, which brought together scientists, promoters, practitioners and policy makers from across the country.

Press meets were organized before and after the symposium to enlighten the media and the public on SRI's importance and the purpose of the symposium. The participation of Tripura Chief Minister Mr. Manik Sarkar and his colleagues and the strong state support in organizing the symposium demonstrated the keen interest of policy makers in promoting water saving and productivity-enhancing methods in rice cultivation. Five books on SRI were released and three best awards each for posters and papers were presented to participants on the recommendation of an independent jury. Four best SRI farmers from Tripura were felicitated for successfully adopting SRI and for achieving high yields. The overwhelming feedback from participants was evidence that the symposium had succeeded in creating synergies between people working on SRI across the country.



The following chapters give a detailed account of the proceedings of the second national symposium.



Contiguous healthy SRI fields at Tripura

Inaugural Session

The inaugural session of the 2nd National Symposium on “System of Rice Intensification (SRI) in India — Progress and Prospects” was held on 3rd October 2007 in the SIPARD Auditorium, Agartala, Tripura. Dr LV Subba Rao, DRR, who facilitated the session, invited the dignitaries on to the dais: Chief Minister of Tripura Mr Manik Sarkar; Finance Minister Mr Badal Choudhury; Chief Secretary, Government of Tripura, Mr Shashi Prakash; Principal Secretary, Planning, Mr S K Panda; , Commissioner and Secretary (Agriculture), Dr G S G Ayyangar, ; Director of Agriculture, Dr S N Sen; Vice-Chancellor, Central University, NEHC, Dr S N Puri; Prof Norman Uphoff, CIIFAD; Project Director, DRR, Dr B C Viraktamath; Director, DRD, Dr M C Diwakar; Director of Extension, ANGRAU, Dr L G Giri Rao; Drs K M Jindal and S G Samal NABARD, Dr Biswanath Sinha, SDTT and Dr Biksham Gujja, WWF. The symposium inaugurated with lighting of the lamp by the Honourable Chief Minister of Tripura Mr Manik Sarkar and other dignitaries.



While, Dr S N Sen welcomed all the dignitaries and participants, Dr Biksham Gujja elucidated on the objectives of the symposium and emphasized that since rice yields in the country had reached a plateau and water resources were depleting, SRI would act as a tool for attaining food security. He congratulated the Tripura government for actively promoting SRI. He said that the Planning Commission could take SRI's success in Tripura as a model for fixing their targets. Dr B C Viraktamath congratulated the Tripura government for its policy support, political



will, dedicated agricultural personnel and willing farmers for making SRI a success in the state. Dr GSG Ayyangar gave a brief account of the agricultural scenario in Tripura and said that the State government aimed to attain self-sufficiency in food by adopting high-yielding varieties, seed replacement (33 percent achieved so far) and improvement of irrigation and credit



facilities. The state had already achieved self-sufficiency, met the food needs of neighbouring states and had brought 15,000 ha under SRI. To upscale SRI, the government had adopted a three-tier system comprising Panchayat Raj Institutions (PRI), farmers and agricultural workers. Mr Shashi Prakash appreciated the efforts of

the department of agriculture, scientists and farmers in Tripura in upscaling SRI and setting an example in India. He demanded that Tripura be declared a Special Agricultural Zone. Prof Norman Uphoff too congratulated the state government for promoting SRI, and stated that the system was finding global acceptance as an eco-friendly option – a correction to the green revolution. He hoped farmers would adopt SRI with minor modifications to suit local conditions. He added that the voluntary participation of international delegates in the symposium revealed the interest SRI had generated among farmers, policy makers and scientists.



The following five books on SRI were released on the occasion: More rice, less water, small state, big results – Experience of SRI in Tripura, More rice with less water - SRI, SRI – A water saving and productivity enhancing strategy in irrigated rice, Farmers experiences in SRI cultivation, and Towards a learning alliance – SRI in Orissa. Four farmers of Tripura, Mr Bharat Sarkar (10.82 t/ ha), Mr Tapan Sen (10.2), Mr Bishu Chand (10.2), and Mr Sajjan Ghosh (7.5) were honoured for



achieving high rice yields adopting SRI. Dr GSG Ayyangar and Dr Baharul Islam Majumder, the crusaders of SRI in Tripura, were presented with mementoes.

Welcoming the delegates, Chief Minister of Tripura, Mr Manik Sarkar, inaugurated the symposium and appreciated its timeliness given

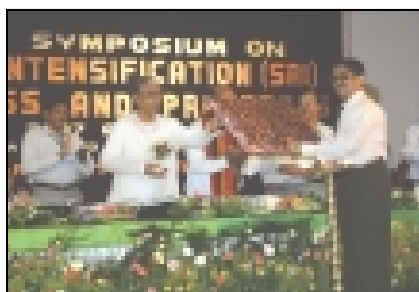


the ongoing crisis in India's agricultural sector. He revealed that the Government of Tripura had formulated a 10-year Perspective Plan in 2000-01 to achieve self sufficiency in foodgrain production by 2009-10. During the last 6 years, the state had increased paddy production by about 1 lakh MT and achieved self sufficiency in breeder,

foundation and certified seed. The target for SRI in 2007-08 was kept at 30,000 ha; already, about 15,000 ha were under SRI during the current Kharif season. He complemented the good work done by the vibrant Panchayat system, scientists and farmers of Tripura and added that he hoped that the recommendations of the symposium would help increase global rice production.

Finance Minister of Tripura Mr Badal Choudhury in his address stated that state agricultural scientists and extension workers were trying hard to popularize the concept of SRI. Though the technology was new to the state, it was well received by even tribal farmers. He assured the state government's assistance and logistic support and also stressed the need to adopt soil conservation measures and to exploited the irrigation potential to the maximum.

The session ended with a vote of thanks by Dr B I Majumder, Senior Agronomist, SARS.





Delegates of II SRI Symposium



Technical Session I

Research Experiences in SRI in India



The session began with the Chairman's opening remarks, in which Dr U Venkateswarlu opined that SRI was creating waves after the Green Revolution . He said he was privileged to organize the symposium. The session had four presentations.

Dr BC Viraktamath made a presentation on "SRI experiences across the country". While

congratulating the Tripura Government's officials, policy makers, scientists, and extension workers for SRI's success in Tripura, he elaborated that the method was gaining importance since 50% of the fresh water available in the world is used for cultivating rice. He revealed that the research trials at DRR during 2003-06 showed that the growth parameters and yield were significantly higher in SRI over conventional methods. Dr. Viraktamath further added that parameters like hulling, milling, head rice recovery, kernel length and width, length-breadth ratio, and grain chalkiness were not affected by different methods of rice cultivation.

He presented data on the SRI trials conducted under AICRIP during Kharif 2004-2006 at 21 locations across 16 states, which revealed that:

- SRI was distinctly superior to the conventional method of rice cultivation and recorded higher yields at 11 locations.
- Enhanced yields ranging from 15-29% were observed using SRI across the locations; even acidic soils showed an yield increase of up to 15%.
- Varietal responses differed under SRI at different locations but profuse tillering was recorded at all the locations.
- Hybrids and varieties with higher tillering capacity performed exceedingly well under SRI.
- Seed cost and pest damage were negligible across locations. There was water saving up to 30 - 40% and improvement in soil health under SRI.

Dr. B.C. Viraktamath expressed the need for continuing research on breeding for varieties with higher tillering ability, using precise amount of water, developing the user-friendly cono weeder to reduce drudgery, selecting suitable areas for SRI, and generating data on long term soil health, pests and diseases and the economics of SRI.

Dr R Rajendran of the Tamilnadu Rice Research Institute, Aduturai, spoke on the “Effect of management components on productivity”. He mentioned that modified SRI (MSRI) gave greater yields, higher water productivity and a 2.24-2.3 cost benefit ratio in comparison to existing rice cultivation (ERC). Mechanical weeding and soil stirring by the cono weeder significantly increased grain yield. Though leaf folder incidence was high, agronomic efficiency was higher with positive changes in a & b content of chlorophyll, better root growth and nutrient uptake in SRI plots. He suggested optimization of “seedling age” and the initiation of field preparation at the 3 leaf stage. He stressed the need for popularizing SRI through community nurseries, training labor in SRI operations, and the introduction of mechanized planting.



Mr P Kishan Rao, a progressive SRI farmer from Andhra Pradesh, spoke on “Is SRI in conflict with conventional wisdom”. He spoke about his own experiences and said that during land preparation, ploughing to a depth of 4 inches was enough to facilitate easy operations with the cono weeder at a later stage. He stressed on the need to use compost and felt that attention

needs to be paid to water supply and drainage. He said his experience had shown that SRI gave good yields even in a crop planted late. Adding sand to the compost and applying it to the seedbed would facilitate easy separation of seedlings during planting. He also spoke about Katayama’s concept and the link between nitrogenous fertilizers and pest attacks. He concluded that a pragmatic approach involving the scientific and farming communities was essential to facilitate SRI adoption in large scale.



Speaking on “Future prospects of SRI in India”, Dr M C Diwakar,

Director, DRD, Patna , indicated the need for a paradigm shift that could include several strategies. He opined that SRI was a better option to overcome the plateau in rice production and that it was the only method involving non-monetary inputs which farmers could take to without much trouble. He gave an overview of SRI demonstrations all over the country and also revealed that DRD planned to cover 5 mha under SRI in Uttar Pradesh , West Bengal, Andhra Pradesh, Karnataka, Chattisgarh and Orissa under the National Food Security Mission (NFSM).



In his concluding remarks, Dr R B Sharma, Director of Research, Indira Gandhi Agricultural University, Chhattisgarh, opined that SRI increases yield and utilizes resources more efficiently with improvement in soil health. He was also confident that the method would gain momentum.

Delegates of II SRI Symposium



Technical Session II

International Experiences in SRI

In his introductory remarks, Chairman Prof. Norman Uphoff briefed the participants on the performance, progress and prospects of SRI in rice growing countries such as China, Indonesia, Cambodia, Philippines, Bangladesh, Vietnam, Nepal, Sri Lanka, Myanmar, New Guinea, Thailand, Pakistan, Iraq, Iran, Bhutan, Afghanistan and Japan and the activities of State Agriculture Units, Departments of Agriculture, and NGOs involved in SRI research and extension. Delegates from Bangladesh, Bhutan, Vietnam, Cambodia and Fiji made observations on the performance of SRI.

Dr Muzzam Hussain, Coordinator, SRI National Network Bangladesh, narrated the agro-ecological constraints to rice cultivation prevailing in his country. He lauded the achievements of SRI under the PETRRA project. However, he indicated that cold temperatures during rabi/boro season proved detrimental to young seedlings.



Dr Karma Lhendup, lecturer, Agricultural College, Royal University of Bhutan, presented the results of the partial SRI trials conducted in three different locations in Eastern Bhutan. He informed that rice transplanted at the 3-leaf stage with 30 x 30 cm spacing contributed to higher yields (6.09 t/ha).

Dr Dung, Deputy Director of Plant Protection, Ministry of Agriculture and Rural Development, Vietnam, revealed that out of 7 million ha planted to rice in Vietnam, 3 million ha were grown under transplanted conditions in North Vietnam. SRI was introduced in Vietnam in 2003 under the FAO - IPM programme and it enhanced rice yields from 5 to 6.5 t/ha.





Dr Chow Chegthyrih, IPM coordinator, Department of Agriculture, Forestry and Fisheries, Cambodia, revealed that SRI introduced in the country in 1999 and spread to 60,000 farm households by 2007, achieving a maximum yield of 4.7 t/ha with savings in seed and fertilizers, i.e., four times the average yield (1.92 t/ha) with existing practices.

Evaluating the SRI experience in Fiji, Dr SV Subbaiah, Principal Scientist, DRR, revealed that Fiji's low rice yields accounted for rice imports worth \$20 million. He reported improved yields with ICM and SRI in comparison to farmers' practice. A local rice variety "Uttam" was found to be most suitable for SRI.

In his concluding remarks, Co-Chairman Dr MC Diwakar, appealed for enhancing the spread of SRI.

The session ended with a vote of thanks by Dr Shashi Bhushan, Principal Scientist (Entomology), ANGRAU.



**Weeding with Weeder
(Cambodia)**

Technical Session III

Experiences in SRI Promotion/Adoption

Making his opening remarks, Chairman Dr R A Sherasiya mentioned that despite rice not being a major crop in Gujarat, 70,000 ha were under rice and soil health was becoming a major issue. He stated that a soil health card being issued to farmers would serve as a good to SRI introduction. Five papers were presented in this session.



Dr L G Giri Rao, Director of Extension, ANGRAU, deliberated on “SRI promotion and adoption – Field experiences across the country”. Experiences and results of the demonstrations conducted at various locations in Tamil Nadu, Andhra Pradesh, Karnataka, Pondicherry, Punjab, West Bengal, Tripura and Uttarakhand were narrated. He

revealed that since 2003, a 25-36% increase in rice yields had been recorded compared to the conventional method across the locations. In Andhra Pradesh, SRI was implemented in 134 locations in 17 villages and Rs 3500/ha was given as incentive to farmers. Two hundred and fifty FLDs were also undertaken with a 49% increase in net returns.

Dr Murari Choudhury, Executive Director, Lok Jagriti Kendra, presented on "SRI, the perspective for household security in Jharkhand". In a study on the food security of 1000 families, an increase in yield from 3.45 to 9.25 t/ha in rice (var. MTU 7029) was observed. During the Boro season, a threefold increase in yield (11.9 t/ha) was recorded compared to the conventional method.



Elaborating on SRI in Tripura, Dr G S G Ayyangar, Secretary of Agriculture, Government of Tripura, informed that presently 16,000 ha were under SRI cultivation. He said the technology had made a major difference to the farming community, with an average rise in productivity of 2 t/ha compared to the conventional method. SRI attempted with a hybrid recorded a rise in productivity



from 6.0-7.6 t/ha. The local varieties recorded a rise in productivity from 2.0-3.8 t/ha, he added.

Dr Debasis Sen, Director, Peoples Science Institute, Utharakhand, shared his experiences on SRI in Uttarakhand and Himachal Pradesh. Rice productivity had seen an increase in rice productivity from 4.0-7.0 t/ha. Organic formulations

such as Panchgavya, Amritajal and Matka Khad were used in SRI. Basmati rice grown under SRI showed an increase in productivity from 56-71% along with a striking rise in the cost:benefit ratio, from 1:2.6 (conventional) to 1:5 (SRI).

Mr Venkatarami Reddy, Directorate of Agriculture, Andhra Pradesh, revealed that SRI was introduced in the state in 2003-04 with 218 demonstrations and 2627 demonstrations were planned in 2007-08. An amount of Rs 3500/ha was given to farmers as incentive, out of which Rs 1000/ha was provided in the form of vermicompost, he revealed. The yield increase by adopting SRI ranged from 18.6 to 41.5% (4.8 t/ha in conventional to 8.3 t/ha in SRI).

The following suggestions emerged out of the deliberations:

1. The need for capacity building of farmers in India so that they can adopt the six principles of SRI
2. Attempts to reduce drudgery by using mechanized weeders based on the spacing adopted in SRI.
3. Supply of the paddy puddler/leveller and weeder on a subsidy basis.
4. Introduction of SRI village concept.
5. Ensuring the availability of quality bio-fertilizers.
6. Quantification of water saved and nutrient uptake.

Dr V Ravindra Babu, Principal Scientist (Plant Breeding), briefed the participants about the posters displayed on 3 October 2007.

The session ended with a vote of thanks by Dr Mahender Kumar, Senior Scientist (Agronomy), DRR.



Technical Session IV

Reflections on Field Visits

In his opening remarks, Prof Uphoff described the overwhelming response of the delegates to the reception by the local farmers, reflecting the happiness derived due to the adoption of SRI. The rapporteurs of the four sessions synthesized their experiences of the field visits and the presentations made.

Mr Biswanath Sinha from Session I rapporteur of the session informed that 65 delegates visited South Bagma, Bagabasa, Barabhiya Bazar, Para Math and South Mirza in Matabari village, under Udaipur subdivision in South Tripura district. Roughly 746 households out of a total of 2339 were practising SRI for past two to three years during all the three crop seasons (Aus, Amaan and Boro). Almost 50% of the households were sharecroppers (baargadar) and marginal farmers (prantik krishak). Principles of transplantation, wider spacing, fertilizer utilization, etc., were by and large adhered to by the farmers. SRI's spread was the result of close collaboration among PR institutions, the Department of Agriculture and State Government. The state government is providing incentives [Rs. 900 for 1.25 kaani of land (1 kaani= 0.16 ha)] , 7 kgs of urea; 2 kgs of MOP; 11 kgs of Phosphate and 4 kgs of biofertilizer) and buyback support to SRI farmers.



Field visit by 1st group (Matabari)

The group noted that:

- Large areas were covered by SRI and are indicated by yellow flags
- The planning and accountability mechanisms at the village level are very strong and institutionalized
- More working days were available for laborers because of SRI
- Sharecroppers were more interested in SRI due to promised higher returns
- A two to threefold increase in yield was observed by the pradhans in all the four villages

- SRI spread irrespective of caste and political affiliations
- It was also practiced in tilla (upland) land rice cultivation
- A bottom-up approach was evident throughout
- Farmers wish to continue SRI even if the incentives are withdrawn
- The group felt the need for proper drainage facilities to be developed
Village-level water bodies could be encouraged to divert the drained water into ponds for effective utilization.

The six presentations in this session included that of Mr R Lingaiah, Secretary, CROPS, an NGO working in Warangal district of Andhra Pradesh, who observed that weeding with a cono weeder was labor intensive and time-consuming, calling for modifications and less drudgery. Dr Ch Padmavathi, Senior Scientist (Entomology), DRR, spoke on insect pest dynamics and arthropod diversity in SRI. She observed high incidence of stem borer in SRI during the reproductive stage and reported that total abundance and species richness was high in SRI. Dr S Ravichandran, Senior Scientist (Agricultural Statistics), DRR, deliberated on “Trends in India’s rice production and productivity: SRI vs conventional method of rice cultivation – “A statistical and economic perspective”. He highlighted that cultivating SRI in 10% of rice area could save Rs 43 million. Dr Pradip Kumar Bora, Scientist (Engg), Assam Agricultural University, said he had taken up SRI in Boro season with variety Joymoti for the first time and had obtained 31% more yield. Dr Amrik Singh, Deputy Director, ATMA, Punjab, shared his experiences of SRI in Punjab and mentioned that the need of the hour was saving water. Dr Anurag Tiwari, Manager (Pre-Harvest), Tilda Riceland Pvt. Ltd, Haryana, spoke on “SRI in Basmati — a win-win situation for farmers and rice processors”.

Dr Rajendran, rapporteur of Session II said his group of 50 delegates visited Bagabasa GP, Sonapur and Indira Nagar in Melaghar subdivision. Rice varieties Swarna, Mahsuri and Pooja were used under SRI. Farmers were pleased with the method and were willing to continue with SRI even if the subsidy is withdrawn.



Field visit by 2nd group (Melaghar)

The team observed that the farmers were facing problems with weeding and other time-bound operations.

There were six presentations in the session. Dr V Ravindra Babu, speaking on grain quality assessment in SRI, observed no influence of management on grain quality. Dr K Surekha, Senior Scientist (Soil Science), DRR, in her presentation on “Nutrient uptake and soil mining study in SRI”, observed no depletion of nutrients in SRI after two seasons. She mentioned that more K was available in Eco-SRI due to paddy straw incorporation.

Dr K Karthikeyan, Assistant Professor (Entomology), Kerala Agricultural University, speaking on pest incidence in SRI, observed moderate stem borer and high blue beetle but low whorl maggot and leaf folder incidence in SRI. Dr G Ravi, Associate Professor (Entomology), TNAU, spoke on SRI and IPM. He reported reduced incidence of stem borer, BPH, whorl maggot and gall midge and increased prevalence of leaf folder along with predatory spiders. Mr Iqbal Singh, a farmer from Jammu & Kashmir, shared his experiences of SRI adoption and recorded an average yield of 4.5–5.0 t/ha with the method. Mr Gopal, a farmer from Tamilnadu deliberated on his experiences with double transplantation in rice, an innovative method of planting rice in ridges and furrows, which could be adopted wherever suitable.

Dr. Narendra Pandey, Senior Scientist, ICAR, rapporteur of Session III, informed that his group of 58 delegates visited Maharaniapur, Maiganga, and East Howaivari of Teliamura.

In Maharaniapur, out of 180 ha, 100 ha cultivated by 143 farmers are under SRI. Cropping intensity of 200% was observed. The varieties grown included Ranjit, Swarna, Pooja, NDR 359 and Tapaswini. Kalikasha and Biron are the local scented varieties. Under SRI, farmers are using 10 to 12 days old seedlings with a spacing of 25 x 25 cm and are leaving alleyways after every 2.5 m. Weeding costs were reduced by 50%. Farmyard manure, PSB and Azospirillum were applied along with 25 kg



Field visit by 3rd group (Teliamura)

N, 16 kg P and 16 kg K. In Maiganga village, the group observed that 100 ha were planted under SRI out of 248 ha of rice area. Seed production under SRI is on in this village. In East Howaivari village, out of 85 ha under rice, 54 ha are under SRI. Farmers were favourably inclined towards SRI due to advantages such as good yield, seed quality, water saving ability, and reduced labor required for weeding. Four papers were presented in this session. . Dr R P Singh spoke on “Response of *Trichoderma* and *Azospirillum* on rice production in SRI”. He mentioned that *Trichoderma* and *Azospirillum* favored rice production and reduced soilborne diseases in SRI. Dr L V Subba Rao, DRR, in his presentation on “Quality seed production in SRI”, mentioned that medium-duration rice varieties were more responsive to SRI than early-duration ones. However, improvement in seed quality was marginal in both . Dr R Mahender Kumar, Senior Scientist (Agronomy), DRR, speaking on “Water productivity in SRI”, reported a 20% increase in grain yield and 29% increase in water productivity under SRI. Dr Shaik N Meera, Scientist, DRR, spoke on “E-learning of SRI” and provided modular options for teaching and learning SRI through distance education.

Dr K Venugopala Rao, Incharge, DATT centre, Kakinada (ANGRAU), rapporteur of the Session IV shared the experiences of his team (55 persons) , which visited Lakshimarayanpur, Sonatala, and West Ganki villages in Khowai subdivision. Rice variety Pooja was found to be performing better than Swarna and Ranjit under SRI. Late planting was observed which lead to poor crop stand.



Field visit by 4th group (Khowai)

The group made the following significant observations:

- Tillers: Tillers of about 25-30 in Swarna; 12-15 in Ranjit and 25-30 in Pooja were observed
- Insect pests: Stem borer, gall midge and leaf folder were prevalent. However, leaf folder is above ETL. The silver shoots due to gall midge were high in Swarna
- Diseases: Sheath blight and foot rot were observed in Swarna and Ranjit
- Fertilizers: Farmers applied compost and 10 kg N, 20 kg P and 15 kg of K to SRI plots

- Insecticides/fungicides: Farmers applied 3-4 rounds of insecticides and one round of fungicide. These are monocrotophos, malathion and Dithane-M-45
- Farmers' response: They found SRI profitable compared to traditional rice cultivation with a yield advantage of 25-30% and wished to continue even if Government support is withdrawn
- The farmers were constrained by the time-bound operations, limited labor which is expensive, and the time and labor consuming operations of the cono weeder
- Among the suggestions given for sustainable SRI were: Seed treatment with Carbandazim @ 1g/l of water to check the spread of diseases
- Supply of quality seed and increase in replacement rate from 30- 50% as the seed produced by the majority of farmers is consumed
- Encouraging the concept of seed village through Farmer Field Schools (FFS)
- Compulsory buyback of produced seed to support quality seed production
- Advocating an IPM package since high humidity, high rainfall and optimum temperature favor the spread of gall midge, stem borer and leaf folder
- Frequent exchange visits between farmer groups

Lessons learnt:

- The systematic organizational approach in Tripura serves as a model for other states in India
- Since land holdings are small, the higher incomes from SRI have endowed farmers with confidence
- SRI should be avoided wherever drainage and soil problems exist

There were eight presentations in this session. Dr JS Prasad, Principal Scientist (Nematology), DRR, stressed the need for monitoring and management of plant parasitic nematodes in SRI. He added that the root-knot nematode causes damage in SRI. However, when water control is not possible, root nematode populations should be kept under check. He observed that decomposing organic matter promotes beneficial and saprophytic nematodes. Dr P Ratna Sudhakar, Principal Scientist (Entomology), ANGRAU, elaborated on insect pest problems and suggested the identification of low-cost technologies to tackle them.

Dr S K Chowdhury, Rice Agronomist, Rajendra Agriculture University, Bihar, spoke on the spread and problems of SRI in Bihar. Dr Subbalakshmi Lokanathan, Professor

(Agronomy), TNAU, elaborated on the agronomic, physiological, microbiological and biochemical factors contributing to higher yields in SRI. Dr S P Singh, Principal Scientist (Agronomy), DRR, compared the results of SRI, ICM and normal methods of rice cultivation across locations in the country. He reported a yield advantage of up to 12% with SRI. Mr Koen Beumer, a student from the Netherlands, impressed upon the need for a careful study and analysis of problems of SRI cultivation so as to suggest the best solutions possible for farmers.

Dr R Durai Singh, Professor & Head (Agronomy), TNAU, developed a cono weeder that could be operated as an attachment to the power sprayer in order to avoid drudgery. Dr Mangal Sain, Principal Scientist, DRR, made a critical analysis of the constraints of SRI at the grassroot level and came up with suggestions to avert them. The session ended with a vote of thanks by Dr Shubrato Shib, SARS, Tripura.



Demonstration of weeding with Conoweeder

Technical Session V

Institutional & Policy Issues

In his opening remarks, Chairman Dr Chandrika Prasad emphasized that since SRI saves water and fertilizers, benefits resource-poor farmers and is eco-friendly, it should be readily acceptable to policy makers. He suggested detailed studies on soil health, pest and disease problems.

Dr Biksham Gujja, Senior Policy Advisor, WWF, spoke on “Scaling up SRI: Need for major strategic shift for ecologically sustainable rice production in India”. He mentioned that 70 percent of water available for irrigation in India is utilized for rice production. Of late, depleting water resources and intra- and inter-state water conflicts have been coming to the forefront and are expected to intensify. Therefore, producing more with less water was paramount. Indicating that Tripura had made good progress in SRI spread, he added that a lot could be done at the national level by enlightening policy makers and extension workers about the system, by developing a strong research base, monitoring and evaluation. This would serve as an opportunity to modify irrigation infrastructure and power supply facilities for their effective utilization. He advocated the building of strong partnerships and wondered why productivity levels in India were low compared to those in China.



Dr A Ravindra, Director, WASSAN, spoke on “Promotional Policies for SRI”. He emphasized that SRI research and spread should follow a systems approach through farmer-to-farmer promotion and a slow shift from utilizing inorganic to organic sources nutrients. He stressed the need for a paradigm shift in extension methodologies with a

scope for including farmer innovations. Since SRI involves neither much external inputs nor private interests, it may not serve the needs of middlemen; hence, NGOs and government agencies could play a major role in up-scaling SRI. He perceived intensity of time-bound operations and the mindset of farmers on issues of higher labor requirement and water control as adding to the risks in SRI adoption. He was firm in the belief that supply of quality seedlings and inputs from a centrally monitored source, management support to farmers, SRI knowledge workers, trained skilled workers, group solutions, investments in infrastructure development (drainage, land levelling, etc.), strong scientific support and incentives for SRI promotion need special focus.

Dr T M Thiyagarajan, Head (Soil Science), TNAU, elaborated on scaling up SRI in Tamil Nadu. He opined that a good alliance should exist between policy makers, researchers, extension workers, end users and KVKs in order to popularize SRI. He advocated growing glyricidia on bunds and its incorporation in combination with inorganic fertilizer. Among the pests, leaf folder, rootknot nematode and black bug incidence were high in SRI. He stressed that training women laborers and adopting a cluster approach would go a long way in upscaling SRI.



Mrs Pushpalata, Chairperson, Ekoventure, an NGO working in Pondicherry, spoke on the impact of SRI in combination with Effective Micro-organisms (EM) technology in the coastal villages of Pondicherry and Tamil Nadu involving dalit women self help groups. She said the women used indigenous and eco-friendly micro-organisms and EM fermented plant extracts to control

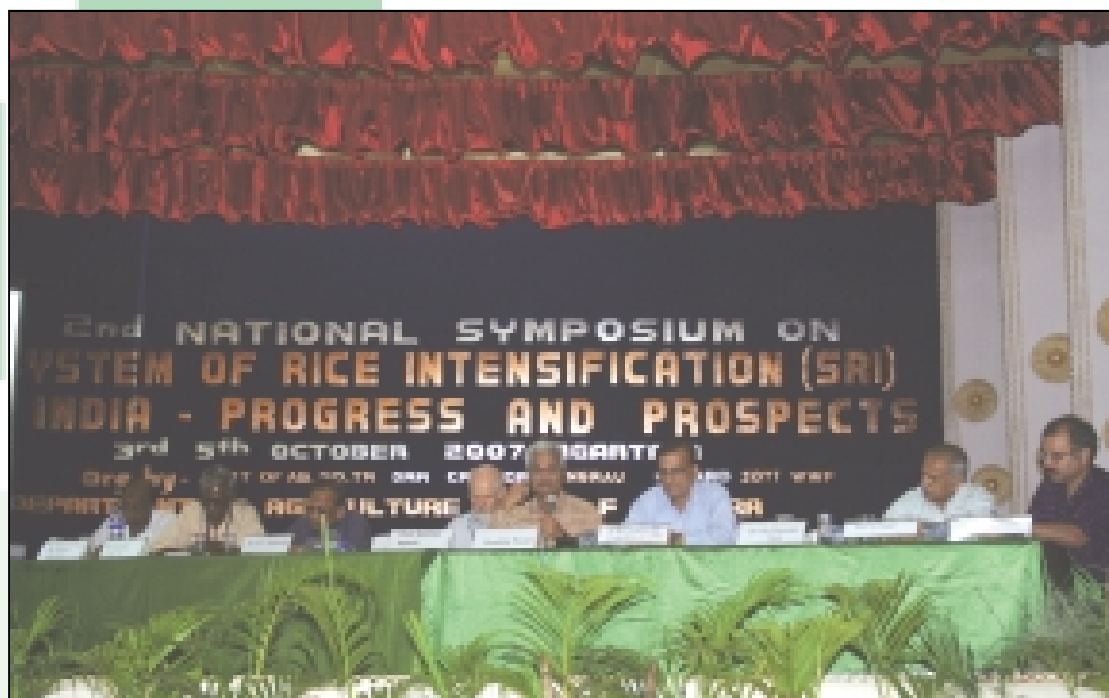
pests, in addition to other IPM components. Misconceptions regarding EMs among agricultural laborers and farmers hindered SRI's acceptance.

The session ended with a vote of thanks by Dr Dhruv Jyoti Pal, Department of Agriculture, Tripura.



Technical Session VI

Panel Discussion on Policy and Extension Support to SRI



Dr Biksham Gujja initiated the discussion by emphasizing that though it was adequately proved that more grain could be produced with less water usage through SRI, its adoption was still on a modest scale across the country. To make an impact to food security and sustainable ecosystems, SRI would have to be adopted on a large scale. The panel discussion was aimed at generating ideas to provide policy and extension support for scaling up SRI. The panelists and the participants actively discussed and deliberated on the following seven issues:



Dr. B. Gujja initiating Panel Discussion

- Q1. What are the financial and institutional arrangements needed to achieve large-scale SRI adoption in India, say to the tune of 5 million ha by 2015?**
- Q2. What kind of extension services and delivery mechanisms are needed to scale up to that level?**

Can our existing institutions deliver such services, even if money is made available to them?

Responding to these questions, Dr Chandrika Prasad opined that the Mission mode programme was the best means to scale up the adoption of SRI, similar to the recent horticulture mission. He felt that KVKs could be utilized for this purpose without any financial burden. Dr A Ravindra added that a differentiation should be made in the upscaling of SRI, between a process-oriented scaling up that needs a different set up and an input-oriented one that doesn't. He added that funds would have to be earmarked and that extension would be possible only through farmer participation.



Dr Sen elaborated that very good linkages between VLW, farmers and departmental staff and monitoring had led to the successful spread of SRI in Tripura. Dr Gurudas Singh opined that SRI needed no additional funding. However buy-back of SRI produce should be arranged.

Dr Ratna Sudhakar felt that local-specific modifications should be introduced for better adoption. Dr PK Samal suggested providing institutional finance instead of subsidy. He added that a campaign similar to the existing polio campaign be adopted. Dr Debashish advocated credit facilities for local workshops to provide weeders and markers required for SRI.

Prof Norman Uphoff suggested that instead of giving subsidy, SRI could have special incentives like produce getting 10-15% additional price, training to farmers, extra wages to labourers, reliable water availability, easy finance, problem solving services, and mutual exchange visits between farmers. He was emphatic that SRI should not be dogmatic.

Dr B C Viraktamath added that district-level planning for SRI should be included in the National Food Security Mission. Mr Madhubabu suggested promoting SRI through 'Adarsha Rythulu' in A.P. A participant from Chattisgarh felt that political will was essential for the spread of SRI. Dr Rajendran stressed the need to concentrate on institutional changes rather than financial arrangements. Dr A K Mishra recommended the concept of an IPM-SRI village and the exclusive use of organics in SRI.

Q 3. Why is there still very little research on SRI? Is it money or that lack of interest? Or has it been the lack of encouragement? What prevents renowned research agencies from conducting nationwide co-ordinated research both on their research stations and on farm?



Dr B C Viraktamath clarified that some research has been done and information needs to be consolidated. At present, AICRIP is also concentrating on generating nationwide information through co-ordinated centres. Mr Jacob called for rectifying past mistakes and generating scientific knowledge on SRI. Responding to this, Dr V S Trimurthy mentioned that research

information was available in projects like AICRP in the 1980s which contributed to enhance yields, while Dr M Dutta opined that SRI could be the harbinger of the second Green Revolution.

He felt that research inputs on specific water saving and nutrient uptake were scarce. Mr Laxmi Reddy, Coordinator, DAATTC, ANGRAU, suggested a role for the private sector in SRI research. Dr Mamta Chatri from Bhutan suggested that focus be given to SRI in the 11th five-year plan with emphasis on government-private partnership. Dr Prabhakara, Sher-e-Kashmir Agricultural University, Jammu, felt the need for consolidating information on SRI.

Mrs Pushpalatha expressed the need for joint efforts by the government and NGOs to generate information on SRI. Dr Uphoff stressed the need for developing a research base on the biological processes that contribute to higher yields in SRI. Dr S V Subbaiah felt that the research information under AICRIP in different agro-climatic zones was not being fully utilized. Dr Chandrika Prasad suggested that scientists from all disciplines form groups and generate information through frequent discussions on SRI.



Q 4. Is it possible for farmers to adopt SRI in large irrigation projects where water is delivered centrally? If so, how? If not, what are the policy and management changes required?

Mr Krishna Rao suggested that SRI be introduced under irrigation projects as the saved water could be utilized by the tailenders and larger areas could be covered. However, Mr K V Rao felt the method should be introduced wherever water control is possible with good gradient, like in Nagarjunasagar and Cauvery project command areas but not in the Godavari delta.



Dr Venugopal Rao said that policy interventions for sound water distribution/regulation are needed. Dr Gopal Chaturvedi suggested a farmer participatory water management system while Dr I S Rao, ANGRAU felt a three-tier capacity building system involving political, the water regulatory authority and water users was essential.

Q5. When farmers are getting more yields with less, why do they need government subsidy? Is there a danger of subsidies rather than SRI's own merit driving SRI?



Dr G S G Ayyangar advocated an incentive to farmers for taking the risk of adopting a new technology. He added that it should be provided for only 2-3 seasons and in kind, for example quality bio-fertilizers. Dr N Uphoff and Dr Muzzam Hussain suggested promoting better MRPs and marketing facilities for adoption of SRI. Mr Anil also suggested

improvement in infrastructure instead of providing subsidy. Dr Rammohan emphasised the need for a subsidy with a choice and Mr Jacob felt that subsidy should be continued till the farmer gains confidence. Dr Trimurthy felt farmers need to be educated on the benefits of SRI while Dr B K Roy suggested a comparative analysis of groups of farmers with and without subsidy. Most participants felt SRI farmers should be given aid either in the form of subsidy or incentive or a support system for the conservation of natural resources.



Q 6. What can India learn from/ offer to other countries regarding SRI?

Mr Imad Sarkaui, WWF-Morocco, felt that SRI researchers should exchange ideas on improvements in techniques and implements. Dr Muzzam Hussain stated that the symposium had helped him gain exposure to SRI and provided a platform to discuss the constraints

experienced by farm workers and researchers. Mr Lhendup from Bhutan said that since villages in Bhutan are far apart, dissemination of SRI knowledge has been difficult. He added that a visit by his country's farmers to SRI farmers in Tripura would be helpful in gathering expertise.

Q7. What types of partnerships can promote SRI?

Dr G S G Ayyangar categorically stated that institutional support, strong technology, political will, policy support, co-operation of village level workers and farmers and a dedicated team of officials at all levels contributed to the success of programmes like SRI. Prof N Uphoff highlighted the role of NGOs in SRI promotion. Dr Ravindra laid emphasis on equal partnerships with all stakeholders with demarcated domains, and keeping the farmer in the driver's seat. Dr A K Basu pointed out that the role of input dealers was vital and that they should be educated to play a positive role in upscaling SRI. Dr Gidda Reddy emphasized the need to actively rope in institutions like ICAR, AICRPs and SAUs to promote SRI. Dr Debasis Sen felt the need for including local credit institutions in upscaling efforts. Mr Prabhakara said infrastructure facilities should be developed to create a congenial atmosphere for SRI. A farmer from Nagapattinam said that SRI could be instrumental in bringing rural youth back to the villages by educating them on its positive aspects.

The discussion ended with concluding remarks by Dr Biksham Gujja.

Dr K S Rao, CRRI, presented excerpts of the posters displayed on 5th October 2007. The session ended with a vote of thanks by Dr L V Subba Rao.



Technical Session VII

Plenary Session

In his opening remarks, Chairman Dr Biksham Gujja appreciated the interest shown by all the delegate. He revealed that SRI could be taken up even in areas with marginal yield improvement since soil health could be improved by utilizing indigenous organics and bio-ertilizers. Later, rapporteurs Dr Mallikarjun Reddy, Dr V Ravindra Babu, Dr P Gidda Reddy, Dr G Ravi and Dr LV Subba Rao presented the salient features of the respective sessions. Dr Ch Padmavathi, A Ravindra and Mr Debasis Sen received the awards for the best paper presentations and Mrs P M Radha, Dr Lakshmi Reddy and Dr Vijaya Bharati got awards for best posters. All the foreign delegates and chairmen and rapporteurs were presented with mementos.

The session ended with a vote of thanks by Dr Vinod Goud, Project Coordinator, WWF, and Dr Baharul I Majumdar, Senior Agronomist, SARS, Tripura.



Recommendations

- 1. SRI a viable option:** The System of Rice Intensification is a viable option for increasing rice production in India while using the limited water resources. Farmers have accepted it across the country and results have been quite remarkable in certain states. The method can be popularised in all rice-growing areas, wherever feasible.
- 2. Scaling up:** So far, SRI has clearly demonstrated benefits to individual farmers. Scaling up is required at the national level in order to see benefits at the river basin and national levels and judge its potential in improving food security while reducing water conflicts. This requires national-level investments and institutional mechanisms. There is potential to convert at least 50 percent of irrigated rice cultivation to the SRI method in the next decade. This will result in major benefits to people and ecosystems while avoiding large-scale investments in irrigation.
- 3. Institutional mechanisms:** In order to build on its current success, a National Steering Committee for scaling up SRI in a consortium mode would help bring about 50 percent of the flood irrigated area under SRI by 2020. Institutions such as Government organizations, civil society and research institutions could play a role in (a) suggesting suitable adoption methods based on agroclimatic zones; (b) identifying suitable areas; and (c) suggesting proper incentives for farmers to adopt SRI.
- 4. Developing a strong scientific research base** would help in better understanding processes like water saving, nutrient use efficiency, pest and disease incidence and soil health over the years in addition to being cost-effective, drudgery-reducing and farmer-friendly.
- 5. National-level evaluations:** Now that SRI is being practiced in almost every state, the time has come to embark on a systematic national-level evaluation of the method and to suggest future pathways for resolving region-specific issues. This may help in: (a) developing proper tools such as weeders, markers etc.; (b) identifying the most suitable rice varieties in each region; (c) zeroing in on the best practices to suit different agro-climatic zones; (d) identifying further research areas to refine the method; (e) suggesting proper extension facilities such as farmer-to-farmer exchange and market mechanisms to promote SRI; and (f) suggesting methods to improve the availability of quality organic inputs..
- 6. Need for regional forums:** In order to exchange information and experiences in SRI between rice-producing countries, regional forums need to be established starting from South Asia.

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Books Released During the Symposium

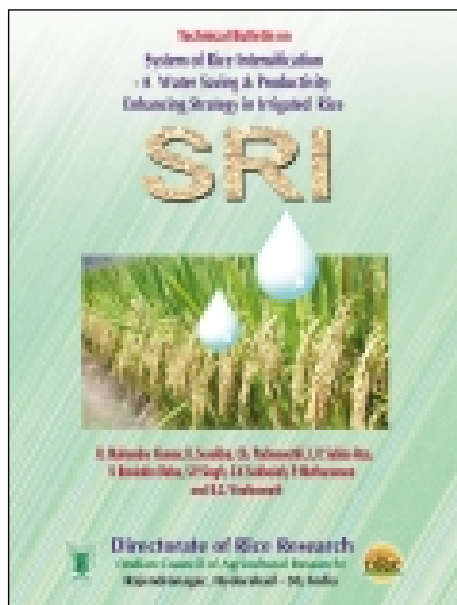
System of Rice Intensification (SRI) – A Water Saving and Productivity Enhancing Strategy in Irrigated Rice; 35 pp.

Publisher : *Dr. B. C. Viraktamath, DRR, Hyderabad*

Authors: R Mahender Kumar, K Surekha, Ch Padmavathi, LV Subba Rao, V Ravindra Babu, P Muthuraman, SP Singh, S V Subbaiah and B C Viraktamath

Rice being a staple food crop, it holds the key to food security in India. It is grown on about 42.5 million ha with a production of about 90 million tons. . Given India's current rate of growth in population and per capita consumption, it is estimated that its rice requirement will be around 100 million tons by 2011-12. This essentially means that the country will have to produce an additional 10 million tons by the end of the XI Plan period to meet food requirements. Keeping this in view, the Government of India has planned to launch a National Food Security Mission to achieve the additional production of 10, 8 and 2 million tons of rice, wheat and pulses, respectively.

The additional rice has to be obtained against the backdrop of declining resources. The area under rice is expected to fall to about 40 million ha in the next 15–20 years, mainly due to water shortage and rapid urbanization. More than 80% of fresh water is consumed for agriculture and 50% of it goes for rice cultivation. It is estimated that rice consumes about 4000–5000 litres of water to produce 1 kg of rice. Hence the need to develop and adopt water saving methods to enhance production and productivity levels in rice.



The System of Rice Intensification has an edge over other farm-based methods since it not only saves on water but also enhances yields and protects the environment. To gain an insight into SRI and optimize it to realize its complete benefits, agronomic trials were conducted at DRR and 30 AICRIP centres spread across the country. This bulletin shares the results obtained from these trials in addition to elucidating on SRI practices, research carried out by DRR and AICRIP centres across the country during the past three seasons, lessons learnt, future strategies and thrust areas for up-scaling to enhance rice production.

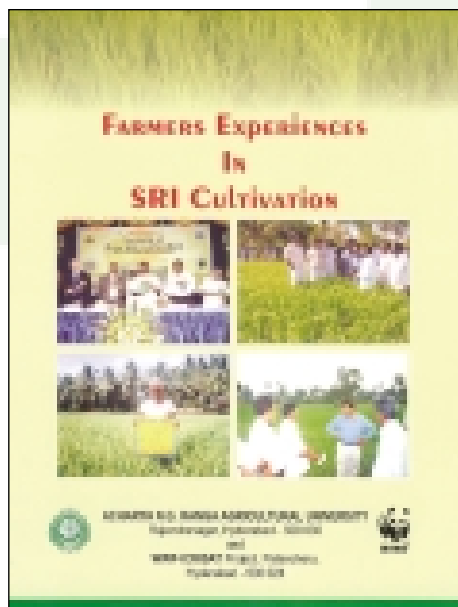
Farmers Experiences in SRI cultivation; 65 pp.

*Publisher: ANGRAU Hyderabad and
WWF-Dialogue Project, Hyderabad*

Edited by: Dr L G. Giri Rao and P Punna Rao, ANGRAU

SRI was introduced during Kharif 2003 in Andhra Pradesh by ANGRAU, Hyderabad. Realizing its potential, ANGRAU has promoted SRI in a big way in association with the WWF-ICRISAT Project, DRR and the Department of Agriculture, Government of Andhra Pradesh. The initiatives taken include on-farm trials, frontline demonstrations, farmer-scientist interactions, media outreach, farmers meetings, working committee on SRI, capacity building programmes, etc..

SRI was introduced with the slogan “less can produce more”. It had a mixed response from the farmers — while some are continuing SRI, others have discontinued it claiming it is labor intensive and involves drudgery in nursery raising, transplanting young seedlings and weeding operations with a cono weeder. The method is finding new followers every season. Practitioners are coming up with innovations to reduce drudgery that may help in large-scale adoption.



Against this backdrop, this book presents the practical experiences of 98 small, medium and large SRI farmers in Andhra Pradesh. It serves as a ready reference for those interested in SRI's performance at the field level, with farmers' perspectives, experiences, constraints, innovations, and suggestions included.

*More Rice, Less Water – Small State, Big Results
An Experience of Tripura, India; 31 pp.*

**Publisher: The Agriculture Department of the Government of Tripura
and World Wide Fund for Nature (WWF)**

With inputs from Biksham Gujja, Baharul Mazumder, Subrata Shib, Shambu Prasad, Koen Beumer, Debasis, VVinod Goud and the New Concept Team

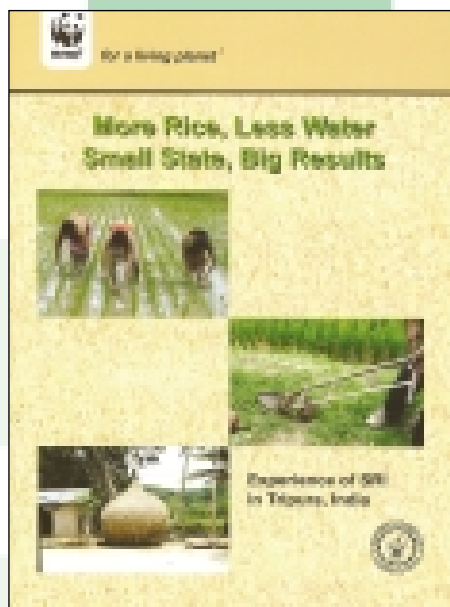
More than 70% of Tripura's population of 3.5 million depends on agriculture for its livelihood. Its economy depends on agriculture. Rice, the main staple, is cultivated

in 250,000 ha with a production of around 920,000 million tons (paddy). Tripura requires more rice in the coming years to meet its growing demand. Currently, it buys rice from other states. Hence productivity improvement is essential.

SRI was first adopted in Tripura on a trial basis in 1999, and has today become a mainstream practice for the state Agriculture Department. Currently it is being adopted in around 15, 000 ha. Productivity has increased on an average by 40% over the conventional method of rice cultivation. The state has a specific target to bring 40,000 ha under SRI by the end of 2007-08; this constitutes almost 12% of the total area

under rice in the state. With the strong commitment of the state government officials and political support, Tripura has been able to provide institutional support to its SRI farmers with an innovative incentive package. This model could be applied in other parts of India to improve rice productivity.

This booklet profiles Tripura, its agriculture, especially rice and water scenarios, the scaling up of SRI and the future directions the Government might take to meet its SRI target.



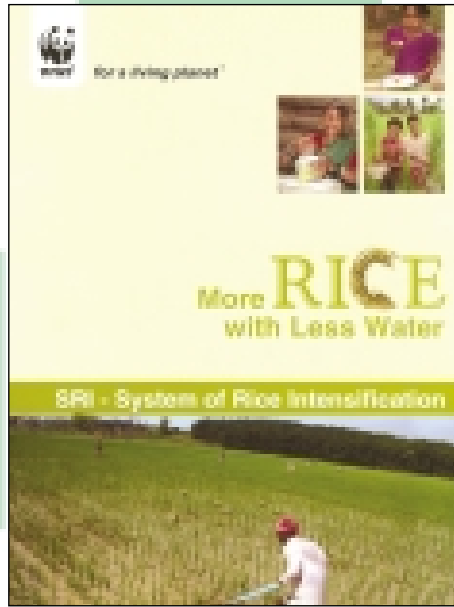
More Rice with Less Water, SRI- System of Rice Intensification; 48 pp.

Publisher: WWF-ICRISAT Project “Dialogue on Water, Food and Environment”, ICRISAT, Patancheru

With inputs from

Biksham Gujja, Philip Riddell, V Vinod Goud, Sraban Dalai, M V R Murty, Richard Holland, OP. Rupela, Punna Rao, Mahender Kumar, Kishan Rao and the New Concept Team

The lifeblood for billions of people, rice is a staple food for more than half of the world’s population. In Asia alone, more than 2,000 million people obtain 60-70% of their calories from rice and its products. Rice production and consumption are expanding in Africa, and it continues to be an important staple in Latin America. In Europe, it is a major food crop in certain regions of Italy and Spain. Rice is indeed a global food grain.



About 70-80% of global freshwater withdrawals are for the agricultural sector, particularly irrigation, and rice accounts for about 85% of this. If we have to meet food needs without compromising on environmental integrity, it is essential to identify and adopt solutions that are environmentally more sustainable.

This book highlights the relationship between rice, food security and water scarcity and examines SRI's contribution to addressing various challenges. It focuses on India, which has the world's largest rice cultivated area and faces major water crises and conflicts. The World

Wide Fund for Nature is working with farmers, scientists and national institutions to promote SRI. WWF's work with rice is part of its vision to improve the productivity of major water-intensive crops like sugar, cotton, etc. Although the report is based on an Indian experience, the findings are relevant to many rice producing countries, with appropriate modifications to suit local conditions.

Towards a Learning Alliance: SRI in Orissa; 78 pp.

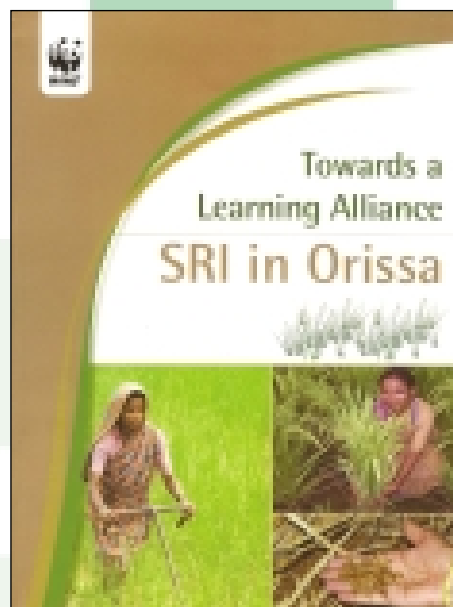
**Publisher: Xavier Institute of Management, Bhubaneswar and
WWF-ICRISAT Dialogue Project, Hyderabad.**

Edited by Dr C. Shambu Prasad, Koen Beumer and Debasis Mohanty

Orissa is recognised as one of the secondary centres of origin of cultivated rice in the world. Rice continues to be the main crop in the state and is grown in over half the gross cropped area. The cropping intensity though is quite low and farming is largely subsistence and rainfed by large numbers of small and marginal farmers with low use of inputs. Despite several interventions in the past to improve productivity, there is a mismatch between technological efforts and farmers practices resulting in large yield gaps and stagnant and even declining agricultural productivity.

Improving rice productivity in a state where poverty levels are one of the highest in the country indeed has major implications for food security. In this context SRI seemed to present an interesting alternative to some farmers and civil society organisations who tried it out a few years back after hearing about it from their networks. Though a late starter, SRI has made considerable progress in the state in recent years with many small and marginal farmers reporting excellent results in the very first cropping season.

This book is the outcome of an ongoing learning alliance in the state that emerged out of a state-level dialogue workshop on SRI held in June 2007. The workshop was meant to create a learning platform for both research and non-research actors to share their experiences and insights so that institutional support necessary for SRI uptake was faster and could build upon the synergies among the diverse SRI actors in the state. The volume has 14 experiences of governmental agencies, research organisations, SRI farmers and non-governmental organisations in Orissa. This volume presents details of SRI in Orissa on the one hand and some insights on scaling up and institutional challenges in complex systems such as SRI on the other. Through the book the authors hope that similar experiences would be tried out in other states apart from strengthening ongoing efforts to scale up SRI in Orissa.



PROGRAMME*Second National Symposium on***System of Rice Intensification (SRI) in India – Progress and Prospects****Dates: 3-5 October 2007. Venue: SIPARD, Agartala, Tripura****Wednesday, 3rd October 2007***Pre-inaugural Session***TECHNICAL SESSION – I****Research Experiences on SRI in India**

Chairman : Dr. U. Venkateswarlu,
Principal Secretary, Govt. of Tripura
Co-chairman : Dr. R.B. Sharma,
Director of Research, IGAU, Raipur

Rapporteurs : Dr. M. M. Reddy, ANGRAU
Dr. Ch. Padmavathi, DRR

0900 -1000	Registration	
1000 -1030	Introduction of the Chairman and Co-Chairman	
1030-1100	Opening remarks by the Chairman	
1100-1105	- SRI experiences across the country	-Dr. B.C. Viraktamath
1105-1110	- Effect of management components on productivity	- Dr. R. Rajendran
1110-1120	- Future Prospectus of SRI in India	- Dr M.C Diwakar
1120-1130	Concluding remarks	
1130-1140	Vote of thanks	

INAUGURAL SESSION

Rapporteurs : Dr. J. S. Prasad, DRR
Subrato Shiv, SARS

0900 -1000	Registration	
1000 -1030	Welcome from Tripura - Cultural programme	
1030-1100	Tea Break	
1100-1105	Invocation/Lighting of the lamp/National song	
1105-1110	Welcome Address by Director of Agriculture, Tripura	
1110-1120	Purpose & Objectives by	Dr. Biksham Gujja, WWF
1120-1130	Remarks by	Dr. B. C. Viraktamath, DRR
1130-1140	Remarks by Commissioner & Secretary, Agriculture, Government of Tripura	

1140-1150	Remarks by	Prof. Norman Uphoff, CIIFAD
1150-1205	Release of the publications (Five books) by Chief Minister and other dignitaries	
	Felicitation of farmers and Officers from Tripura by WWF	
1205-1215	Inaugural address by Honorable Chief Minister	Shri Manik Sarkar, Tripura
1215-1225	Presidential Address by Honorable Minister for Finance,	Shri. Badal Choudhury, Tripura
1225-1230	Vote of Thanks by	Dr. Baharul Mazumdar, Senior Agronomist, SARS

TECHNICAL SESSION – II

International Experiences in SRI

Chairman : Prof. Norman Uphoff,
Cornell University, USA.

Rapporteurs : Dr . V. Ravindra Babu,DRR.
Dr. Partha Pratim,Tripura.

Co- chairman : Dr. M. Diwakar, Director, DRD

1730-1735	Introduction of the Chairman and Co. Chairman	
1735-1740	Opening remarks by the Chairman	
1740-1755	Agro Ecological Aspects of SRI in Bangladesh	-Dr. Muzzam Hussain
1755-1810	SRI implementation in Bhutan	Dr. Karma Lhendup
1810-1825	SRI experiences at Vietnam	- Nguyen Van Phuc
1825-1840	SRI experiences at Cambodia	- Dr. Heang Rattana
1840-1855	Introduction of SRI in Fiji	- Dr. S. V. Subbaiah, DRR
1855-1910	Posters Summary (First day)	- V. Ravindra Babu, DRR
1910-1925	Observations and concluding remarks by the Chairman and Co. Chairman	
1925-1930	Vote of Thanks	

TECHNICAL SESSION – III

Experiences on SRI promotion / adoption

Chairman : Dr. R. A. Sherasiya,
Director of Agriculture, Gujarat

Rapporteurs : Dr P. Gidda Reddy, ANGRAU
Dr. Mrinmoy Datta.Tripura

Co- chairman : Dr.S.K.Sinha, Director of Agri. Sikkim

1245 -1250	Introduction of the Chairman and Co-Chairman
1255-13.00	Opening remarks by the Chairman

1300- 1315	SRI Promotion and Adoption - Field Experiences Across the Country	- Dr L. G. Giri Rao
1315- 1330	SRI experiences from Tripura	- Dr. G.S.G Ayyangar
1330- 1345	Farmers Experiences from Tamil Nadu	- Dr .T. M. Thiyagarajan
1345-1355	SRI - the perspective for house hold security	- Mr. Murari Chowdhary
1355-1400	Promotion of SRI among marginal farmers of Uttarkhand	- Mr. Debasis Sen
1400-1500	Is SRI in Conflict with 'Conventional Wisdom'?	- Mr. P.Kishan Rao
1625-1645	Discussion	
1645-1655	Concluding remarks by Chairman & Co-chairman	
1655-1700	Vote of thanks	
1700-1730	Tea & Coffee Break Poster Viewing	
1930	Cultural Programme followed by Dinner	

Thursday, 4th October 2007

Exposure Visits to SRI Rice Fields in Tripura

(Details of places and groups visited)

<u>Group</u>	<u>Place of visit</u>
Group I	- Matabari
Group II	- Melaghar
Group III	- Teliamura
Group IV	- Khowai

Group	Chairman	Rapportuers	Liaison officer	Co-ordinator	Officer-in-charge
1	Dr Thiyagarajan, TNAU	M. Biswanath Sinha, SDTT, Bombay	Basab Dey, SA-MTB	Uttam Saha, AD	Dr.D.P.Sarkar, JDA
2	Dr. L.G. Giri Rao, ANGRAU	S.Lokhanathan, TNAU	Ashish Saha, SA-MLG	S. Chakraborty AD	P.K. Datta, DDA
3	Dr. S. V Subbaiah, DRR	Dr. Narendra Pandey, Raipur	P. Ghosh, SATLM	Bijoy Roy, AD	R.P Mallick, DDA
4	Dr. S.P.Singh, DRR	Dr. K.Venu Gopal Rao, ANGRAU	R. Das, SAKHW	Phulak Choudary, AD	S.Das, JDA

Friday, 5th October 2007
TECHNICAL SESSION – IV
Reflections on Field visits

Chairman : Prof. Norman Uphoff,
CIIFAD

Rapporteurs : Dr. G. Ravi, TNAU
Dr. Subba Lakshmi, TNAU

Co- chairman : Dr S. N. Sen, Director of Agril,
Tripura

0900-0905 Introduction of the Chairman and Co-Chairman

0905-0910 Opening remarks by the Chairman

Presentation by Rapporteurs of the groups

0910-0920 **Group I** - Matabari

0920-0930 **Group II** - Melaghar

0930-0940 **Group III** - Teliamura

0940-1000 **Group IV** - Khowai

1000-1030 Open Discussion

1045-1055 Observations and concluding remarks by
the Chairman and Co-chairman

1055-1100 Vote of Thanks

1100-1130 Tea Break

TECHNICAL SESSION – V
Institutional and policy issues

Chairman : Dr. Chandrika Pra
Director General

Rapporteurs : Dr. L. V. Subba Rao, DRR
Dr. P. Punna Rao, ANGRAU

Co- chairman : Dr. R. C. Samui, Principal,
Col. Ag. Tripura

1130-1135 Introduction of the Chairman and Co-Chairman

1135-1140 Opening remarks by the Chairman

1140-1155 Scaling up SRI: Need for major strategic shift for ecologically
sustainable rice production in India - **Dr Biksham Gujja**

1155-1210 Promotional Policies for SRI - **A. Ravindra**

1210-1225 SRI in Andhra Pradesh - Initiatives of State Department of
Agriculture - **D. Rushendranath**

1225-1245 Discussion

1245-1255 Concluding remarks by Chairman & Co-Chairman

1255-1300 Vote of thanks

1300 -1400 Lunch

TECHNICAL SESSION – VI

Panel Discussion on Policy and Extension support to SRI

Falicator : Dr Biksham Gujja

Rapporteurs : Dr J. S. Prasad, DRR
Dr. K.Surekha

PANEL MEMBERS

1400-1530	Prof. Norman Uphoff, CIIFAD, USA Dr G.S.G Ayyangar, IAS, Commissioner & Secretary, Tripura Dr. Chandrika Prasad, DG, UPCAR Dr B.C. Viraktamath, Project Director, DRR Dr S.V. Subbaiah, Principal Scientist, DRR Dr A. Ravindra, Director, WASSAN Mr K.V. Rao, Farmer, Andhra Pradesh Mr K.V. Krishna Rao, Farmer, Karnataka Mr Jacob Nellithanam, Chattisgarh
1030-1045	Poster summary- K. S. Rao, CRRI, Cuttack
1530-1540	Observations and concluding remarks by the Chairman and Co-Chairman
1540-1545	Vote of thanks
1545-1600	Tea and Coffee Break

TECHNICAL SESSION – VII

Plenary Session

Chairman : Dr Biksham Gujja
Co- chairman : Dr. G.S.G. Ayyangar, IAS,
Commissioner & Secretary, Tripura

Rapporteurs : Dr J. S. Prasad, DRR
Dr. K.Surekha

1600- 1630	Report by Rapporteurs of Five sessions
1630-1635	Presentation of awards , best paper and Poster
1635- 1650	Concluding remarks and recommendations by Chairman
1650-1700	Vote of Thanks - Dr. V. Vinod Goud, WWF Dr.Baharul Mazumdar, SARS, Tripura
	National Anthem

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Resource Material on SRI

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A few SRI websites

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“MORE CROP PER DROP”

