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SRI-LMB Newsletter

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Asian Center of Innovation for Sustainable Agriculture Intensification (ACISAI), Asian Institute of Technology (AIT)

Boosting yields, raising incomes, and offering climate-smart solutions: System of Rice Intensification paves the way for farmers to emerge as more successful "agripreneurs"

IN FOCUS

Farmers from eleven mostly rainfed provinces of Cambodia, Laos, Thailand, and Vietnam have reported higher yields and profits from paddy grown with SRI management practices.

In comparison with pre-project baseline performance, SRI practices helped improve livelihoods across the Lower Mekong River Basin (LMB) by increasing average rice yields by **52%**, farmers' net economic return per hectare by **70%**, labour use efficiency by **64%**, and water productivity by **59%**. Total energy inputs required for farming operations decreased by **34%**, along with significant net reductions in greenhouse gas emissions. These results were reported at a regional workshop of the SRI-LMB project held at Novotel Sukhumvit, Bangkok on November 1-2, 2018.

The results were reported from **582 research sites** spread across **33 districts** in eleven provinces of the four countries, all as a part of a regional project led by the Asian Institute of Technology with funding support from the European Union with a total cost of action of €3.4 million.

Approximately 75 representatives participated in the two-day workshop, including representatives from the European Union, the Food and Agriculture Organization of the United Nations, Oxfam America, SRI-Rice at Cornell University, the University of Reading, the University of Queensland, the Ministries of Agriculture and Cooperatives of Thailand, of Agriculture and Rural Development of Vietnam, of Agriculture, Forestry, and Fisheries of Cambodia, and of Agriculture and Forestry of Laos.

Overall, the project has helped small-scale holders, and women in particular, in the Lower Mekong Basin countries to have more sustainable livelihoods. This was done by using innovative techniques such as SRI to increase productivity and generate more income and, at the same time, to reduce adverse impacts on the environment, thus making rice cultivation more sustainable.

In this issue:

"The European Union is committed to the achievement of the world's Sustainable Development Goals (SDGs) and, in particular to the eradication of poverty and hunger. This project is helping small-scale holders, women in particular, in the Lower Mekong Basin countries to have sustainable livelihoods. This is done by using innovative techniques to increase productivity, and generate more income and, at the same time, to reduce the impact on the environment, thus making rice cultivation more sustainable" says **Mr. Jerome Pons,** Head of Cooperation at the European Union Delegation to Thailand".

This project is funded by the European Union.

A project implemented by the Asian Institute of Technology.

Highlights of Regional Workshop in Thailand

The workshop also highlighted that the policy environment across the LMB study countries is at different stages of development and yet evolving and that policies need customization based on requirement and contexts. Nevertheless, the SRI-LMB has facilitated the development of informal farmers' groups in **11 provinces** across all four countries by engaging **15,000 farmers** in trials and adaptation of new ideas, plus (less directly) **45,000 farmers** over the past six years. "These groups, if strengthened further can provide a basis for developing effective farmer organizations that can accelerate sustainable rice intensification and diversification along with market development for smallholders. So it is important to incentivize them in their climate-smart practices and to offer them opportunities to become 'agripreneurs'" says Project Manager **Dr. Abha Mishra**. More importantly, the reported beneficial outcomes (economic, social and environmental benefits) of SRI project, along with the participatory approach involved in the wider adoption of SRI practices, will contribute to achieving the sustainable development goals (SDGs).

The workshop concluded with the recommendations that the next phase of the SRI-LMB should see the integration of SRI and Conservation Agriculture practices along with market development for smallholder agriculture development.

National Workshop & Farmer Congress, Thailand

The National Workshop and Farmer Congress was held at Ton Thong Hotel, Uttaradit, Thailand, on 29 and 30, March 2018, to share project results and experiences. About 200 individuals, including approximately 150 farmers, and staff and representatives from Vocational Training and Development Center for Thai People along the Border Areas (VTDC), Uttaradit, Department of Nonformal and Informal Education (NFE), Surin, Department of Agriculture, Rice Department, Department of Agriculture Extension, Rice Research Center, the Brain Bank; SRI MAS and Oxfam, participated in the event.

Dr. Abha Mishra, Director, ACISAI, AIT gave a brief overview of the agriculture sector in Thailand and the SRI-LMB project, implemented in partnership with VTDC, NFE Surin and Surin Rice Seed Center in the provinces of Uttaradit, Surin and Sisaket, respectively.

Mr. Prayoon Dangkong, Director of VTDC, welcomed the Vice Governor and other participants, and recounted how the SRI-LMB project, with support from EU and AIT, started working in Uttaradit. He informed that the project farmers were pleased with the increased yields and higher profit. He thanked all agencies involved in project implementation.

His Excellency the Vice Governor of Uttaradit, **Mr. Sumith Gerdklam**, expressed his happiness about the positive contributions of the project to the farming communities. He discussed the key land use changes in the Uttaradit, mostly in favor of commercial and fruit crops. While this helped raise farmer incomes, it also led to periodic gluts depressing market prices. Hence, efforts to increase yields while decreasing production costs were relevant.

He thanked all project agencies, including the European Union and AIT, for supporting the farmers. He then led the workshop participants to visit the stalls that had been set up as part of the Farmers Congress.

Three stalls were set up by the VTDC staff and Uttaradit farmers, highlighting SRI practices and experiences, usage of microbial pesticides and bio-extracts for countering pest problems, and farm machinery. Two additional stalls were managed by the farmers from Surin and Uttaradit, selling rice and other Thai desserts.

This was followed by an interactive Farmers Discussion Panel with eight expert SRI practitioners. The farmers shared their experiences on how SRI practices helped build up their agro-ecosystems, including soils, and increased yields. Reduced costs of cultivation mainly due to lower seed and pesticide usage helped improve farm profitability. Some adopted SRI for seed production. Though SRI with transplanting technique was labor intensive, it was possible to cultivate up to 1.5 ha per household through community labor exchange. One non-project farmer-entrepreneur on the panel shared his experiences on growing his organic rice export business. His advice to the farmers: Look for increasing farm profitability, not simply crop yield.

The farmers identified market demand for the produce, access to water, varietal choice, soil fertility, knowledge about and interest in farming, and ability of farmers to work hard, as important factors influencing rice cultivation and farmer livelihoods. They expressed their satisfaction with their experiences with SRI. They highlighted the importance of continued adoption of good, ecological practices, usage of own seeds, and more involvement of the younger generation in farming, for making farming more sustainable.

Mr. Adoonsak Chairat, Agricultural Expansionist from Uttaradit Provincial Agriculture Office, delivered his presentation on 'Successful Agricultural Management: Strategies and future plans.' He explained the importance of planning for profitable farming. On the second day, Dr. Abha Mishra provided an overview of the SRI-LMB project implemented in the lower Mekong Basin region highlighting the objectives, approach, reach and impacts. She noted that SRI was not simply about single seedling transplanting, but about making farming more profitable and sustainable.

Ms. Bussakorn Mongkonpithayathorn from Rice Research Center, Phitsanulok, shared the results from her experiments comparing yields from three plots where young seedlings were transplanted using labor and machines, and parachuted by labor standing on land preparation machines. Though first system produced high yields and allowed fertilizer application during transplanting, it was labor-intensive. Machine-transplanting system produced the highest yield, but required seedling raising on trays. With rice profitability decreasing, many farmers were switching over to broadcasting seeds at present.

The workshop video can be seen at:
https://www.youtube.com/watch?v=xG0YctSEW_M&t=34s

Studying the feasibility of cultivating potato after rice harvest with minimum tillage in Vietnam

The Center for Initiatives for Community Empowerment on Rural Development (ICERD) facilitated participatory research with 20 women farmers in two villages of Bac Giang province, Vietnam. The study was conceptualized with the premise that minimum tillage cultivation of potato will reduce cost of cultivation and enhance cropping intensity, yield and soil fertility.

With increasing male migration, Vietnamese women play a central role in farming. Potato production can fetch twice the income derived from rice cultivation. Lack of sufficient labor availability and higher cultivation costs are key among factors preventing women from growing potato. The experience from the National IPM Programme suggested that minimum tillage cultivation of potato increased productivity and incomes, and, reduced labor, irrigation water usage and pesticide application. The crop could be taken up after the second rice harvest on lands typically left fallow. Usage of paddy straw as mulch could enhance soil fertility and assist farmers cope with the government regulations against burning crop residue.

Based on this understanding, the study to compare potato cultivated under minimum tillage and conventional systems was carried out between November 2017 and January 2018 as a part of SRI-LMB training intervention for women farmers.

While many cultural practices were similar for the two systems, the minimum tillage plots differed from the conventional plots in land preparation, mulching, irrigation provision and pest management practices. Guided by ICERD, the women farmers kept a systematic record of the growth, development and economics of potato.

Their data showed that the crop growth in minimum tillage plot was more uniform; it spread more and faster on the beds and experienced less disease incidence (bacterial wilt and late blight) compared to that in the conventional plot. More number of clusters with heavier tubers were produced. Extrapolation of yield data showed that the minimum tillage plots produced 4.5 and 4 Tons / hectare (T/ha) more yield than the conventional plots in the two villages (16.6 T/ha and 15.2 T/ha, respectively).
Analysis also showed that the costs of seeds, labor, pesticides and irrigation were less in the minimum tillage plots. Extrapolation of all costs and returns data for one hectare showed that potato cultivation on minimum tillage plots produced net returns of USD 3933 and 1896 in the two villages, 107 and 82% more than that from the conventional plots, respectively (1 USD = 23000 VND).

ICERD points out that the low investments needed for land preparation and harvesting, the latter which could be done by simply pulling the tubers instead of digging them out, in minimum tillage plots, as important factors which make potato cultivation possible for women and the elderly. The straw used for mulching helped in creating a better crop ecosystem, which enabled healthier crop growth and lower use of chemical pesticides. With mulch being recycled into soils after potato cultivation, it enhanced soil fertility and reduced the practice of straw burning, contributing to mitigating greenhouse gas production.

More details on this activity can be accessed in the project report available at:
http://www.sri-lmb.ait.asia/downloads/Support%20to%20SRILMB%20FPAR%20Women%20Groups%20Vietnam_Final%20Report.pdf

Community training on bio-mat preparation for women farmers

Many rural Vietnamese households raise livestock including poultry and pigs for household consumption and income generation. The enclosures for these animals are mostly located next to the household dwellings. Hence, the farm families are often exposed to the pollution related to the manure produced, including the foul odour. In many locations, the manure is discharged into surroundings and not applied to crops.

Bio-mats are prepared by mixing the biomass and mulch typically used on the floors of animal enclosures with certain fermented biological agents. They are used as bedding material for animals to absorb their waste discharge. They help in deodorizing the animal enclosures and run off animal waste into surrounding areas. Periodically, they are removed and used for composting. It is suggested that manure and waste decompose faster with this process.

With support from SRI-LMB, ICERD, after involving Women's Union in the communes, trained 100 farmers, 82 of them women, in preparation and use of bio-mats and subsequent compost making. This activity was tied to compost usage in home gardens, for ensuring better nutrition for the farm families. Noticing the benefits of using bio-mats, the women's union planned to impart this training to 150 members in 2018, with an expectation that about 90% of the trainees would adopt these practices.

Considering the high usage of pesticides in Vietnamese agriculture, four workshops to understand the prevailing pesticide usage practices and their impacts in the three communes, and provide suggestions for improvement, were conducted. A total of 80 individuals, 57 of them women farmers, participated in these workshops.

The participants revealed that the pesticide usage in their villages had drastically increased over time. But the use of personal protective equipment (PPE) by farmers was not widespread. Unused pesticides and their containers were discarded without any effort for safe disposal. The pesticide exposure for women, as they became more involved in farming, had multiplied. Pesticide drifts could also affect households and schools near the fields, increasing the risks for children. They also noted that several disorders and diseases, including high blood pressure, gynecological disorders and premature births were on the rise. After understanding the prevailing practices and risks related to pesticides, the facilitators provided suggestions for reducing and safe pesticide usage, which ranged from proper method of spraying and cleaning equipment to safely disposing pesticide containers.

The project also conducted four separate trainings for 100 farmers, 74 of them women, on alternatives to chemical pesticides. They were trained on the basics of agro-ecosystems, differences between chemical and bio-pesticides, proper spraying methods and, the use of Protein bait Ento Protein 150DD to counter fruit fly in several cucurbit vegetables and Metharizume anisopliae for mitigating brown plant hopper (BPH) incidence in rice.

ICERD engaged the Commune People's Committee with learnings from the trainings provided. The Committee issued the Direction that at least 70% of the commune households would try bio-pesticides during the following crop season. Other community institutions such as the Women's Union and Youth Union promised their volunteers for training other farmers in the commune for achieving this.

Women farmer and community training on bio-mat preparation, composting and pesticides in Vietnam

Pilot model testing for sustainable rice intensification based on SRI principles in Vietnam

Landholdings in Vietnam are small, with majority households having less than 0.5 hectares (ha). Following the FPAR training, smallholders can indeed adopt some of the SRI practices even working independently. But it is only when farmers in an area agree to cooperate that they can control irrigation water to their lands as per the SRI system, synchronize planting to enable easier and more efficient pest management using biological inputs, share labor and explore the possibility of getting better price for their produce. With this understanding, ICERD coordinated the implementation of the pilot model to promote sustainable rice intensification based on SRI principles on a 10 ha area in Thanh Son village of Dong Phu commune in Bac Giang province. The main objective was to demonstrate the feasibility of community collaboration for applying key SRI practices over a large area, facilitated by FPAR-trained women farmers.

The 10 ha plot belonged to 30 farmers, 24 women and 6 men; 13 of them (12 women and 1 man) were trained previously in the FPAR under the SRI-LMB project.

A core group among these comprising five FPAR farmers with the Chairwoman of the Women's Union as the leader was established for ensuring implementation as per the plan. Each of the members in this group were responsible for coordinating the adoption of cultivation practices agreed by the group, as per the plan. Group members were trained on various topics including SRI, Integrated Pest Management (IPM) and pesticide risk reduction. The village head and the person responsible for controlling water for crop cultivation were briefed about the activity with a request to cooperate.

All members agreed to monitor their crop closely and report to the group leader on a weekly basis. A neighboring 10 ha area was considered as the 'conventional plot' for comparison purposes. The following table provides details on the cultivation practices taken up in both plots.

Cultivation practices	Pilot plot (SRI plot)	Conventional plot
Land preparation	Beds of 100 to 120 cm width separated by furrows were prepared	No beds were prepared; conventional land preparation
Variety	Khang dan 18	Khang dan 18
Seed quantity / ha (Kg)	21.6	41.6
Planting method	Direct seeding	Direct seeding
Manure or compost / ha (Tons)	4	0
Urea / ha (Kg)	194	228
Urea application	Based on need as per crop growth stage	Applied several times not based on crop growth stage
Phosphate fertilizers / ha (Kg)	417	555
Potash / ha (Kg)	189	205
Potash application	At panicle initiation stage	During late crop season
Usage of bio-control agents	Metharizume *anisopliae* for managing BPH	None
Chemical pesticide application	1 application of herbicide	4 to 5 applications of herbicide and insecticides
Irrigation water management	Intermittent wetting and drying – 5 times	Continuous flooding

Table: Cultivation practices in Pilot and Conventional plots

The farmers in the pilot plot used substantially less external inputs compared to their conventional counterparts. Their crop experienced lower pest and disease incidence. The cost of cultivation in pilot and conventional plots were USD 1032 and 1301 / ha, respectively. Yield from the former was 5.8 T/ha, and the latter, 5.2 T/ha. Net return from the pilot plot was USD 1045 / ha against USD 563/ha from the conventional plot. The pilot project demonstrated that it is possible to encourage adoption of SRI and other ecological practices at scale by providing the right support for the farmers.

More details on this activity can be accessed in the project report available at: **http://www.sri-lmb.ait.asia/downloads/Support%20to%20SRILMB%20FPAR%20Women%20Groups%20Vietnam_Final%20Report.pdf**

Provincial and National Review Workshops in Lao PDR

The FPAR activities in Lao PDR came to an end in late 2017. Three provincial workshops were organized by the Department of Technical Extension and Agricultural Processing (DTEAP) between 23rd and 27th July 2018 in the project provinces of Savannakhet, Khammouane and Vientiane. The main objective for these events was to share and discuss the FPAR results and experiences. Led by the SRI-LMB country coordination team, the workshops were attended by 78 participants (17 women) including the coordinators and staff from the project as well as other government departments from the provinces and districts, and the FPAR farmers. Discussions from these workshops fed into the national review workshop.

The national review workshop was held on 3rd August 2018 at Lao Plaza Hotel, Vientiane, to discuss the results and experiences of the SRI-LMB project in the background of relevant national policies. Co-chaired by Mr. Thongsavanh Phanthalavong, Deputy Director General of Department of Agricultural Extension and Technical processing (DTEAP); Dr Abha Mishra, Director of ACISAI, AIT; Mr. Jan Ketelaar, Chief Technical Advisor of FAO IPM Pprgramme, and Mr. Ignacio Oliver Cruz from the Delegation of the European Union to Lao PDR, it was attended by 68 people (17 women) representing the FAO, the Delegation of the European Union to Laos, project teams at national, provincial and district-levels, farming communities, various government departments including the Department of Planning and Finance (DoPF) and the Department of Agriculture, and some Non-Government Organizations.

Mr. Thongsavanh Phanthalavong welcomed all the participants. He said SRI was one of the seven important methods of rice cultivation in Laos. By enhancing the yields of the smallholders, it was contributing to achieving the objectives of the government food security program.

Dr. Abha Mishra highlighted that SRI is smallholder friendly who has less financial resources but greater control over household resources. With better knowledge and skills farmers can manage household resources more efficiently. SRI can contribute towards the green growth in agriculture in Lao PDR.

Mr. Ignacio Oliver Cruz the European Union to Laos commended the project for increasing productivity and profitability of farmers, while decreasing energy use and carbon footprint, and, for reaching out to 15000 farmers directly, and 30000 farmers indirectly.

Mrs. Keo Odoune, **Mrs. Khampeuth Vonglattana** and **Mr. Xayalath Chanlakhone**, coordinators of the project in Vientiane, Khammouane and Savannakhet provinces, respectively, summarized project activities, results, experiences and outreach details from their respective areas. The higher yields obtained with lower resources with SRI practices were highlighted especially as being suited for small landholders who depended on producing rice mainly for household consumption. They also expressed the utility of SRI practices for seed production.

Mr. Viengxay Photakoun, the Project Coordinator in Laos discussed the key details of the project in Laos. Starting with the training of 90 farmer and district trainers in Central Farmer Participatory Action Research (CFPAR) activities in 2015, the project had conducted 28, 18 and 82 Farmer Participatory Action Research (FPAR) activities during successive seasons until 2017, involving 2134 farmers, including 1605 women.

Mr. Sonchanh Vansavath from SRI-Pro Net 21 project shared their experiences of promoting and scaling up SRI from Luang Prabang province. Their project compared SRI with other methods of rice cultivation for 10 seasons. With an average yield of 5 T/ha, most of their farmers were positive about SRI.

Mr. Phoukhaothong from the Save and Grow project of the FAO shared their experiences with SRI and scaling up SRI. Their experiences showed that while yields with SRI practices at 5 T/ha surpassed that in control plots (4 T/ha), they were the highest when SRI was integrated with fish raising (5.8T/ha).

This was followed by a presentation by **Dr. Abha Mishra** who explained the project implementation, results and experiences from the four lower Mekong basin countries. She informed that a consultant was working for bringing out the monitoring, evaluation and learning experiences from Laos, which would be shared in the regional workshop scheduled for November 2018. She also showed the participants a video on project implementation in Thailand. The video was prepared by the VTDC center, Ministry of Education, Thailand in local Thai language which is similar to Lao Language.

Lastly, three champion farmers, **Mr. Theun, Mr. Sombath Meunvongsa** and **Mr. Tongsouk Phengsavanh** from Vientiane, Xiengkhuang and Luang Prabang provinces shared their experiences with SRI. They explained that they were able to obtain higher yields with lower costs of cultivation. However, for proper water management as per SRI technical definition, access to irrigation was a must. They pointed out that farmers had to be more involved with SRI and in some cases, location specific adaptation is must, as done by Thai farmers.

Workshop to Enhance Cooperation and Sharing among SRI National Networks and Stakeholders in Asia

A Workshop on "Enhancing Cooperation and Sharing among SRI National Networks and Stakeholders in Asia" was held on October 18-19, 2018, at the Leverage Business Hotel, Skudai, Johor, Malaysia. The workshop, which was hosted by The Malaysian Agroecology Society for Sustainable Resource Intensification (SRI-Mas), was attended by over fifty participants, including SRI network leaders, and representatives from local ministries, academic institutions, civil society organization (CSO), farmers, the United Nation Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO). The event was co-organized and funded by SRI-Mas, the ACISAI at AIT, and the SRI International Network and Resource Center (SRI-Rice), with additional funding provided by UNDP. The overall objective of the workshop was to enhance cooperation and sharing among System of Rice Intensification (SRI) National Networks in Asia. This workshop enabled the exchange of information and sharing of experiences and knowledge among the Asian participants from Brunei, Cambodia, Malaysia, Myanmar, India, Indonesia, Iraq, Laos, Nepal, Philippines, Thailand, and Vietnam. Participants from Benin, Costa Rica, Kenya and the USA provided additional perspectives and input from Africa and the Americas.

On the first day, participants were welcomed by **Mr. Anthony Wong**, Chairman of the Organizing Committee, and **Dr. Abha Mishra**, Co-convener of the Workshop and Director of ACISAI. The first part of the workshop consisted of presentations on national SRI networks and programs in Asia, regional SRI initiatives and networks, and global SRI networks. Presentations were made by Asian national SRI network leaders from Vietnam, Indonesia, Malaysia, Philippines, India, Nepal, and Japan/Taiwan. The network leaders presented successes and challenges experienced by their national SRI networks, and their thoughts on how an SRI alliance at the regional level can benefit or benefit from their national SRI networks. Other Southeast Asia SRI representatives from countries without national networks (Laos, Myanmar, Cambodia and Brunei) also presented information on how SRI is developing in their countries and how their organizations and other stakeholders in their countries could both contribute to and benefit from and SRI regional alliance in Asia. In the planning session of the workshop, the participants discussed topics covering policy environment, equipment and innovation, research, marketing networking and, lastly, capacity building and for networks themselves and for several expertise areas.

The group discussion centered around objectives of cooperation, prioritizing common areas of regional engagement, and means to achieve planned activities. Possible models of regional engagement were presented, followed by a discussion on perceived needs, possible structure, and dealing with constraints.

Finally, the participants recognized that Asia is in a unique position to scale up SRI due to the diverse regional achievement and long and deep experience with SRI. It was recognized that developing an enabling policy environment, marketing, innovation, information sharing, research collaboration among farmers and researchers, and capacity building all need to also be addressed in order to upscale SRI. The consensus of the workshop participants was to form a non-formal but structured SRI Regional Alliance, with an appointed secretariat and subgroups are to be established based on topics such as research, equipment and marketing. The name and operational details were not defined, but the Alliance will likely be housed at the ACISAI Centre at AIT and begin with a website to provide basic information.

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We reserve the right to edit all contributions. Please send inputs at **srilmb@ait.asia** and cc to Dr. Abha Mishra, Project Manager-SRI-LMB (**abhamishra@ait.asia**).

Website: **www.sri-lmb.ait.asia**

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