LEAD LECTURE https://doi.org/10.58297/AZAM5740

SRI Adoption through Innovative Alliance-Building: Learning from the SRI-LMB

Abha Mishra*

Leader, Regenerative Farming, RoundGlass Wellbeing Pvt. Ltd., Mohali, India;
Former Director, ACISAI, AIT, Thailand
*Corresponding author email: abha.ait@gmail.com

Abstract

Given the challenges presented by climate change, water shortage, and land degradation, sustainable agriculture strategies that increase farming systems' resilience are needed more than ever. This is especially true for sustaining rice production which is the staple food for hundreds of millions of people. Agroecology-based System of Rice Intensification (SRI) is seen as a way forward in transforming food and agriculture systems, especially for the smallholder farmers to build an inclusive, safe, sustainable and resilient society. The findings reported here are based on the engagement that the Asian Center of Innovation for Sustainable Agriculture Intensification (ACISAI), Asian Institute of Technology (AIT), Thailand had in the Lower Mekong River (LMB) basin countries (Cambodia, Laos, Thailand, and Vietnam) using a regional project commonly known as "SRI-LMB". Using a local, national and regional innovation platform that was designed to systematize engagement and strengthen communication for fuelling innovation, more than 15 institutions were involved in the six-year-long farmers' participatory action research (FPAR) trial located in the 33 districts of 11 provinces in the LMB. The SRI was used as an 'entry point' for such engagement-led-transition. Average yield along with factor productivity increased by more than 50% with a significant reduction in cultivation costs, energy use, and greenhouse gas emission. The purpose of this paper is to share results, and also to detail three key processes that led to innovations in different areas for better adoption: 1. the multi-stakeholder platforms used for action; 2. The FPAR that led to community development; the evidence-based policy and strategies that can support the sustainability of rural livelihoods.

Keywords: System of Rice Intensification (SRI), Lower Mekong River Basin, Smallholders, Climate-Smart, Innovative platform

Introduction

Globally, there are some 608 million small farmers who produce more than 80% of the world's food contributing to national and even global food security (FAO, IFAD, UNICEF, WFP and WHO, 2021). Particularly in Asia, majority of farmers are smallholders who own and operate the majority of farmland, but they hold less than 5 hectares per farm. FAO explained that food, health, trade, and climate change are interdependent and the pandemic has revealed the fragility of these linkages. The crisis has threatened progress towards achieving the Sustainable Development Goals (SDGs), which promises to bring about a better world for all people by 2030. Redesigning sustainable food systems with active engagement with farms and farming communities is one of the offered solutions which is gaining momentum in Asia and beyond.

Redesigning sustainable food systems demand integration of political and social dimensions along with ecological and economical dimensions. In this context, the role of agroecology (AE) is evolving and gaining momentum. Agroecology is seen a way forward in transforming food and agriculture systems to build an inclusive, safe, sustainable and resilient society.

Keeping this in mind, the Asian Center of Innovation for Sustainable Agriculture Intensification (ACISAI), Asian Institute of Technology (AIT), Thailand implemented an EU-funded regional initiative in the Lower Mekong River (LMB) basin countries (Cambodia, Laos, Thailand and Vietnam) from 2013 to 2018 using a regional project commonly known as "SRI-LMB'. This six-year long project engaged more than 15 institutions (academic, research and development), 30,000 farmers (58% women), 78 ministries staff, 40 researchers, 15 faculties, 25 students, and 12 development professionals in a farmers' participatory

action research trial located in the 33 rainfed districts of 11 provinces in the LMB.

The System of Rice Intensification (SRI) principle was used as an 'entry point' for such engagement-led-transition. The main objective of the project was to engage farmers' participation by educating themselves about the System of Rice Intensification (SRI) practices and to facilitate building strong farmer networks at the community level. In contrast with traditional methods of rice cultivation, SRI techniques require less water, seed, manure, and labour and promise higher yield and economic returns.

Methodology

As a part of this FPAR intervention, the common issues and interests expressed by farmers producing under rainfed conditions in all four countries were to achieve higher yield with reduced costs of production by reducing input use for cost saving and for making rice cultivation more efficient and profitable.

Major activities included exchanging ideas on new or alternative agro-ecological farming techniques, developing low-cost location-specific technologies through farmer's participatory action research with profitable harvesting and economic advancement through better market opportunities for rainfed farmers. Documenting the results and sharing them within farming communities and with communities at large through an inclusive participatory process, from local to national and regional levels, was the modus operandi of the project. Evidence-based policy options for more supportive policies were generated through a participatory consultation process working closely with all relevant stakeholders, including policy-makers in the countries.

Results and Discussion

With the support of ministries and governmental agencies in all four project countries, Cambodia, Laos, Thailand, and Vietnam, the project functioned well in building capacity and confidence among farmers. More than 15,000 farmers (> 50% women) participated directly in the farmer-led field trials located in 33 districts of 11 provinces of the four countries, and another 30,000 were reached indirectly. The number of farmer-participatory experiments conducted was more than 1,500: 121 at 60 action-research sites in 2014; 465 at >173 sites in 2015; and then 1,134 at >582 sites in 2016-17.

The results showed that in comparison with the pre-project baseline, SRI practices helped to improve livelihoods and the environment across the LMB region in numerous ways (Figure 1):

- Average rice yield increased by 52%, and net economic returns by 70%,
- Labour productivity was increased by 64%, water productivity by 59%, and fertilizer use-efficiency by 75%.
- The total energy input required for farming operations was decreased by 34%, along with significant reductions in per-hectare net emission of greenhouse gases, respectively by 14% with irrigated rice production, and by 17% in rainfed cropping (Mishra *et al.,* 2021, 2022).

Monitoring of the adaptation response of farmers showed that across the region, a majority of farmers applied two major principles of SRI after receiving season-long training: (1) fewer seedlings or seeds per hill hole, and (2) wider spacing. The average yields reported from farmers' fields after the FPAR training was in the range of 7-18% more, and average net economic return ranged from 15% to three times more. In comparison to male farmers, women farmers reported higher yields and higher economic returns (Mishra *et al.,* 2019).

Some of the key innovative processes that were used to fuel agroecological transition and SRI adaptation and adoption at farmer's field along with some initiatives to support such transition are detailed here. They are categorized under three groups:

1. Multi-stakeholder networks & platforms (academics, researchers, Farmers Organizations) enabling co-creation of knowledge & participatory research for supporting family farming & food system transformation
2. Enhancing rural communities' initiatives and development, and transfer of technologies
3. Policies and strategies (from regional to local levels) to support family farmers & sustainability of rural livelihoods/communities.

In addition, the programme also supported the process that led to innovation in higher education institution curricula to better address agroecology-led sustainable food system transition in Asia.

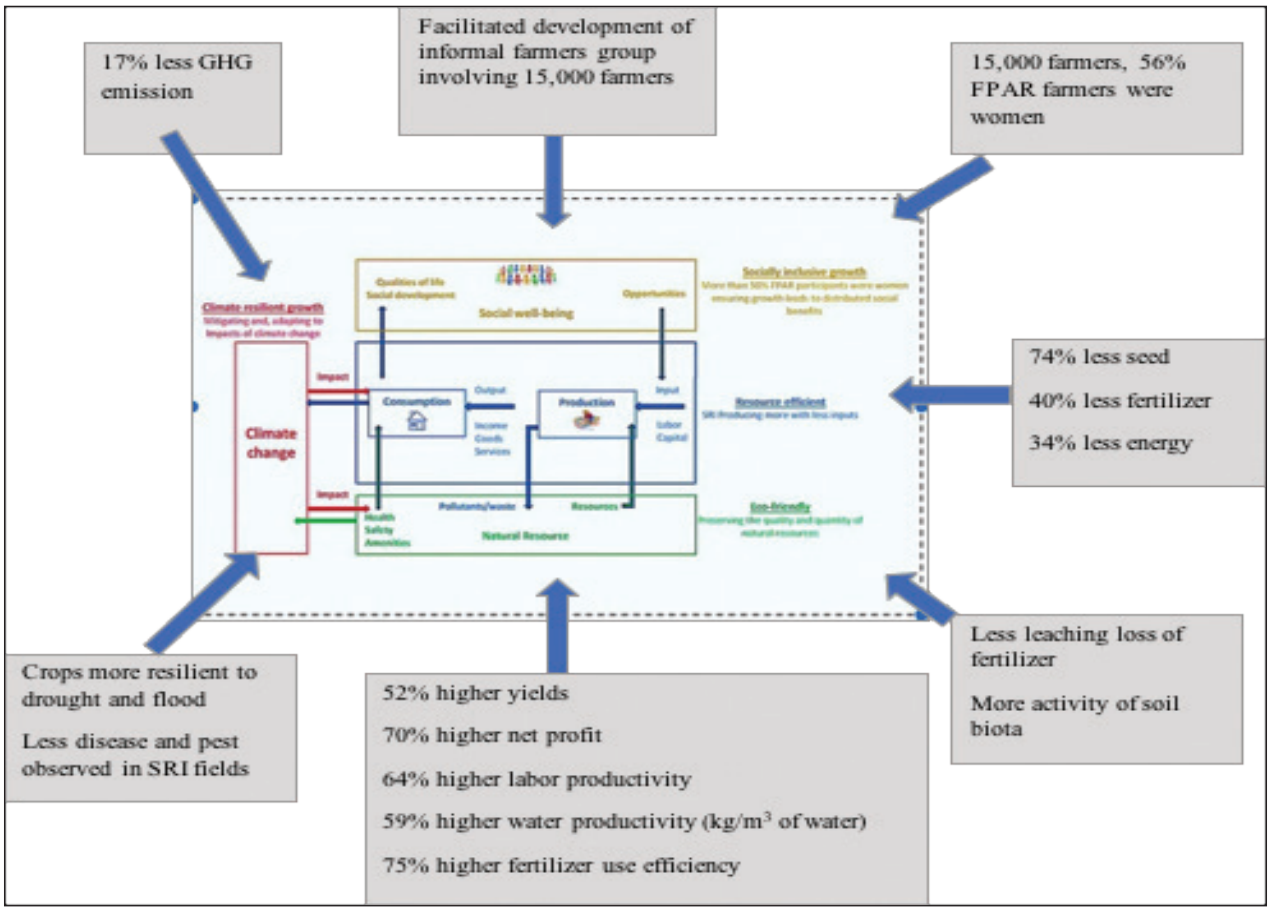

Figure 1: Green growth in agriculture with System of Rice Intensification practices using the farmers' participatory action research approach

Multi-stakeholder networks & platforms (academics, researchers, Farmers' Organizations) enabling co-creation of knowledge & participatory research for supporting smallholder's farming & food system transformation

To achieve the project objective through better collaboration at all levels, the SRI-LMB established local, national and regional project management unit (Local Management Unit (LMU at province level), Programme Management Unit (PMU at country level) and Programme Coordination Unit (PCU at regional level), respectively) that led to the development of innovation platforms at all level for implementation, knowledge-sharing and dissemination (**Figure 2**). These processes of network building and strengthening that were initiated by the project were expected to continue as a common meeting-point at all levels, serving as platforms for facilitating policy dialogue on food security, research for development, marketing improvements, and extension capacity for the rainfed LMB region. During the tenure of the programme, the individuals and organizations that worked with these LMUs, PMUs and PCU got first-hand opportunity to engage in knowledge management and dissemination. Particularly at local levels, farmers, farmer-trainers, and district trainers, along with NGOs and GO staff, were facilitated to articulate local needs and aspirations of farmers into the conduct of the Farmers Participatory Action Research (FPAR) via their respective local management units (LMUs). Similarly, LMUs supported the development of ways and means to educate more farmers in their respective communities on the results and outcomes of their participatory action research (PAR). They also facilitated wider diffusion of knowledge through various means. In addition, these local groups through their experiences of working with the project acquired greater skills of management, bookkeeping, and various tools and techniques of extension, as well as the art of analysis and interpretation of their own experimentation process and results.

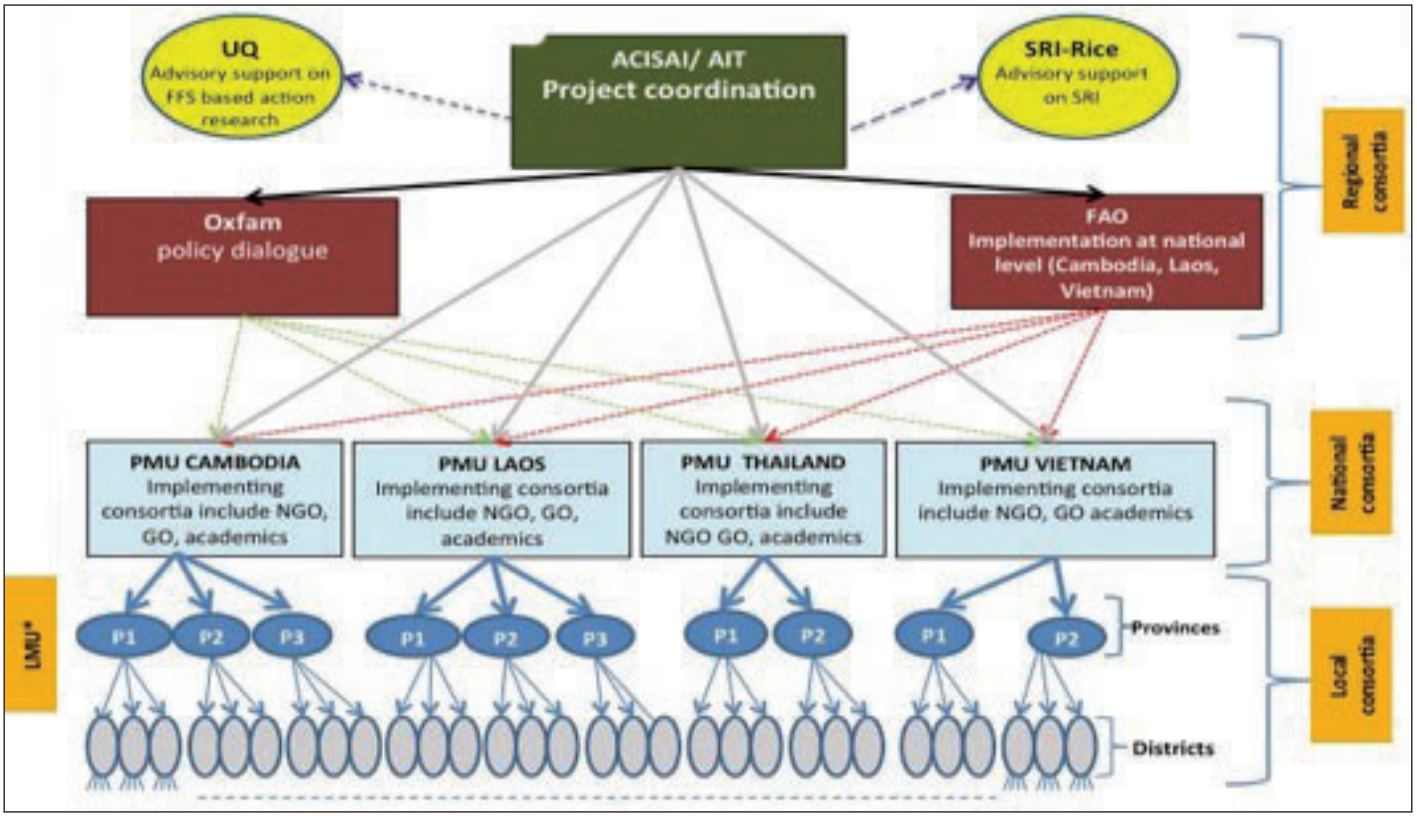

Figure 2: Programme Implementing consortia

ACISAI – Asian Center of Innovation for Sustainable Agriculture Intensification; AIT – Asian Institute of Technology; CFPAR – Central Farmers' Participatory Action Research; FAO-IPM – Food and Agriculture Organization – Integrated Pest Management; FPAR – Farmers' Participatory Action Research; GOs – Government Organizations; LIP – Local Innovation platform (possible outcome of the proposed processes); LMU – Local Project Management Unit; NGOs – Non-Government Organizations; NIP – National Innovation Platform (possible outcome of the proposed processes); P1, P2, P3 – Province 1, Province 2, Province 3 PCU – Project Coordination Unit (coordinated by AIT); PMU – Project Management Unit (coordinated by country offices of FAO-IPM in Cambodia, Laos, and Vietnam, and in Thailand by AIT); RIP – Regional Innovation Platform (possible outcome of the proposed processes); SRI-Rice – SRI International Network and Resources Center, Cornell University, USA; UQ – University of Queensland, Australia*

Enhancing rural communities' initiatives and development, and transfer of technologies

Using Farmers Field School approach, below structure was established (**Figure 3**) but at some places, the structure was adapted based on the existing local government extension departments' programme implementation structure and also according to the farmer's needs and requirements. The design involved 50% women (at least) and 10% landless to have an inclusive intervention.

This structure facilitated the systematic introduction of SRI/FFS approaches for the development of knowledge-intensive and location-specific technologies by bringing farmers, researchers, trainers and other stakeholders together, and by fuelling their innovative capacity. Apart from these tangible and quantifiable direct benefits to the target groups of farmers, locally-developed technologies for rice and other crops could take a horizontal spread pathway and reached to other farmers in proximate communities (approx. 50,000 farmers, based on past FFS experience in the region) through field day. Through this learning-centred approach, we also refined the curricula options for women and landless in order to capitalize of the opportunity that the action presented for furthering the leadership of women, especially in household decision-making and economic accomplishment. The process of engagement led to the development of informal farmers groups and network in all four countries.

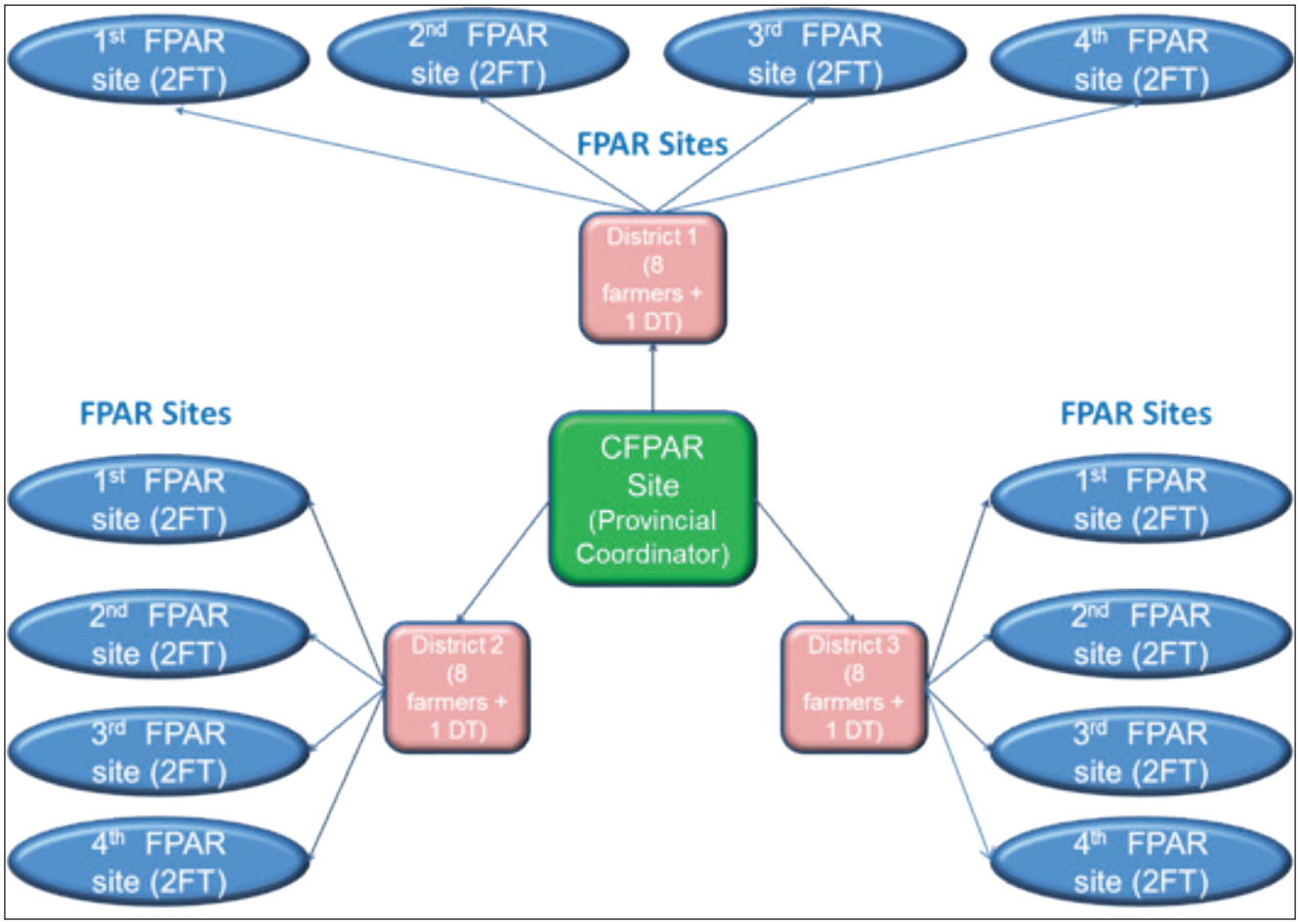

Figure 3: Structural diagram of CFPAR and FPAR in one province

CFPAR = Central Farmers' Participatory Action Research (at the provincial level); DT = District Trainer; FT = Farmers' Trainer; FPAR = Farmers' Participatory Action Research (at the village level, 4 sites/district); One FFS site = run by two FT, set up two experiments involving 60 farmers (30 farmers in each experiment).

It was perceived that such community-led engagement should enable the small farm producers to diversify their market-driven activities "creating" more opportunities for women, including in input-output services and value-chains (through FO- managed Collective Action), with proper policy and institutional support. These measures, if promoted along with the provision of performance-based incentives, such as credit, and infrastructure like storage /processing, would help attract the rural youth and thus reverse the rural-urban migration and support the sustainable transition.

Policies and strategies (from regional to local levels) to support smallholder farmers & sustainability of rural livelihoods/communities

As a part of key policy recommendations, the outcome of this project was seen as a foundation for 'green growth', and a way forward for participatory policy and programme development for ensuring better market access, price, and returns, also as a step towards NDCs contribution under Paris Agreement along with achieving SDGs. The project further noted that the ASEAN Food Security Policy (2015-2020) recommended SRI and CA integrated agroecological practices to benefit smallholders under the climate-smart initiative, however, there has not yet been much visible action taken on the ground. The research done on the policy environment and the institutional responses to the adaptation revealed that the adaptation and adoption of agroecological practices like SRI in the region need to be further strengthened realizing that the macroeconomic situation across the LMB countries is at different stages of development and yet evolving (**Figure 4**).

For example, where self-sufficiency is still a concerned, an intensification strategy can be applied to help small-scale farmers become more self-sufficient. At some point scaling

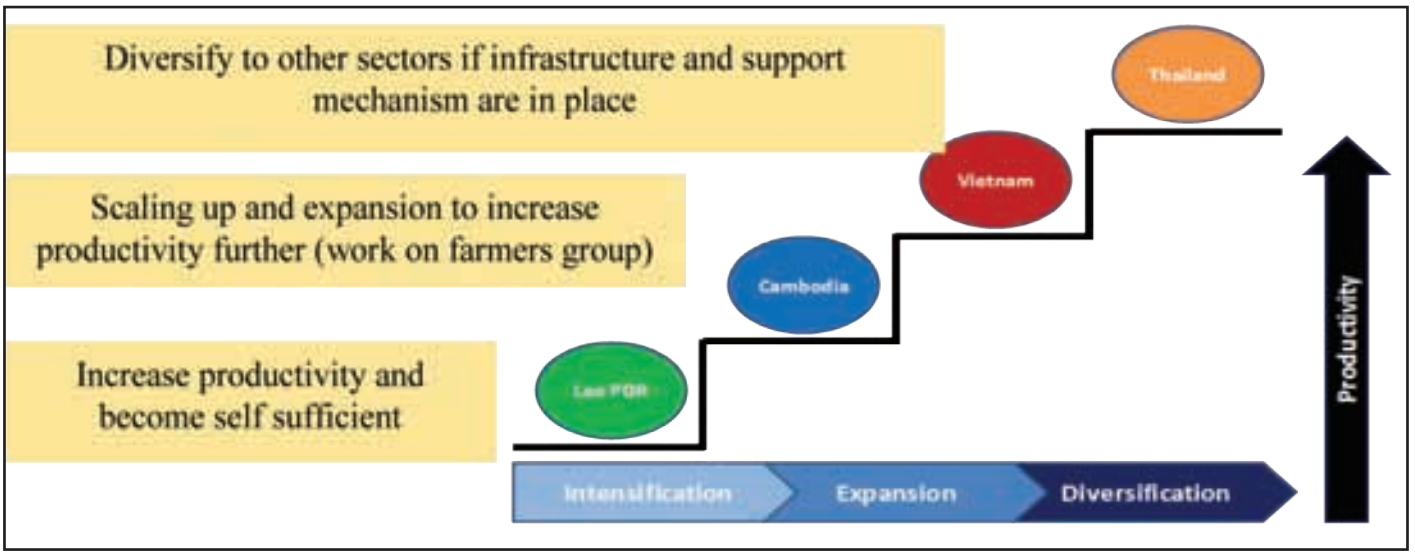

Figure 4: Macroeconomic situation of all four LMB countries and possible next steps towards economically efficient Green Growth and sustainable intensification in agriculture (Oxfam 2018)

up and expansion strategies may become relevant and can help the farmers to expand and increase productivity further. As farming develops and the macroeconomic situation improves, some farmers may diversify into other industries and/or link to market (initially local and then international), provided infrastructure and other support mechanisms are in place.

Innovation in HEIs curriculum to better address agroecology and smallholder farming

A transition to sustainable food systems requires interdisciplinary knowledge and cross-departmental collaboration drawing from social sciences rural development, agronomy, extension, biology, botany, artificial intelligence, etc. It is well perceived that such integrated academic courses and formal training programmes on agroecology could be useful for government staffs, policy makers and other development professionals who take lead in implementing the development programmes in these areas. The SRI-LMB innovative alliance was able to set an example on how mutually inclusive education, research and outreach activities can create conducive environment for such transition. No doubt that conventional disciplines receive more policy support and resources at academic institutions, yet there is interest evolving to initiate dedicated programme in this direction. Taking this further, AIT and FAO joined their hands through formal collaboration to deepen their engagement to support the transition for agroecology based sustainable food system in Asia.

Following areas were suggested to explore for joint research, education and trainings: 1. Joint research project for mapping out and identifying the gaps in the area of agroecology and sustainable food systems (integrating the Tool for agroecology performance Evaluation (TAPE) in academic curriculum as a practical tool to engage students. 2. Establishing regional network of HEI; 3. Involve faculties in global and regional technical and policy consultation processes; 4. Internship/fellowships programme for Master and PhD students (engage students in FFS); 5. Gather consensus on innovations that have a significant impact among various stakeholders in the region and disseminate the selected innovations for wider implementation; 6. Develop a curriculum that helps to understand the growing demand for healthy and nutritious foods (market demand, consumer percept's); 7. Link CSO/community institutions with university education; and create a programme that prepares rural youth to be professional managers of land, water and other resources to support the transition and reverse the migration.

To strengthen it further, there was a recommendation to form a non-formal but structured SRI regional alliance, with an appointed secretariat and subgroups to be established based on topics such as research, equipment, and marketing. These alliances are evolving. With some external funding support, such institution building can be possible. The International donor community should align their support to facilitate such a transition sooner than later.

References

ASEAN 2015. ASEAN Integrated Food Security (AIFS) Framework and Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS), 2015-2020. Association of Southeast Asian Nations, Jakarta.

FAO, IFAD, UNICEF, WFP and WHO. 2021. The State of Food Security and Nutrition in the World 2021. Transforming food systems for food security, improved nutrition, and affordable healthy diets for all. Rome, FAO. https://doi.org/10.4060/cb4474en

Mishra A, Ketelaar J, Uphoff N and Whitten M. 2021. 'Food security and climate- smart agriculture in the lower Mekong basin of Southeast Asia: Evaluating impacts of system of rice intensification with special reference to rainfed agriculture' *International Journal of Agricultural Sustainability*, vol 19, pp. 152-174. Available at: https://www.tandfonline.com/doi/full/10.1080/14735903.2020.1866852

Mishra A. 2019. 'Boosting Yields, Raising Incomes, and Offering Climate-Smart Options: The System of Rice Intensification Paves the Way for farmers to Become More Successful "*Agripreneurs*"'. SRI-LMB project report, 115 pp.

SRI-Mas 2018. Workshop to Enhance Cooperation and Sharing among SRI National Networks in Asia. Johor Bahru, Malaysia, 18-19 October 2018. SRI-Mas Workshop Report, 22 pp.