

The Practice of the System of Rice Intensification in Northern MYANMAR

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SRI experience began in Myanmar through the efforts of Metta Development Foundation, a pioneering national NGO in this country. Metta has been facilitating an ecological approach to improve crop production through the introduction of Farmer Field Schools (FFSs) in collaboration with local organizations and church groups in different parts of Kachin State and Shan State in the northern part of the country.

In 2000, Metta organized its first season-long, training-of-trainers (TOT) course for 32 staff and volunteers of three local organizations, who have been implementing FFS in the communities. With technical assistance from the International Institute for Rural Reconstruction (IIRR) based in the Philippines, the TOT was coordinated and managed by former IIRR staff member, myself. While working at IIRR as a rice specialist, I had learned about SRI from Norman Uphoff (CIIFAD) and initiated trials with SRI methods in the northern parts of the Philippines, and in Sway Rieng province of Cambodia under IIRR's collaborative projects with partners of those places.

Although these trials were not managed carefully and the practices were not all used correctly, I was impressed by the number of tillers that each rice plant produced in those trials. During the TOT in Myanmar, I introduced the idea of SRI to the training participants. The participating Metta staff found the concept of synergy embodied in SRI very congenial with their agroecological thinking and they began trials.

Evaluations

For the vast majority of farmers in the Kachin and Shan States, rice is the major source of livelihood. However, low yields of rice, associated with many soil and water problems, have kept their communities below the poverty line. An important aim of

the FFSs is to provide farmers there with the knowledge and skills to increase the productivity of their rice fields.

Our primary focus has been on improving soil fertility by enhancing the biological activity of soil, and by efficient use of water since water is very scarce and valuable in the area. Improving productivity of both these resources is, coincidentally, important in SRI. Finding this great similarity of objectives with SRI, Metta started implementing SRI trials in its own training center and in farmer's fields in the year 2000.

2000 trials

The first trials were carried out in farmers' fields during Metta's first season-long-training, July-November, at Alam, Myitkyina, the capital of Kachin State. The wet season there usually has monthly rainfall of 12 to 18 inches between June and October. The trials were established in two separate plots, 800 and 1,000 square meters, respectively, each managed by a small group of participants.

Each plot was planted with three different spacings: 25x25, 30x30, and 35x35 cm, and with 10-day-old seedlings. The seedlings were planted one by one (a single seedling per hill) immediately after they were uprooted from the seedbed. The variety was an improved local variety. However, the planting was done one month later than is optimal for that season.

As an alternative to compost in each plot, 300 kg per hectare of oilcake was used. Weeding was done every ten days using a rotary weeder. The soil was maintained moist through well-drained by removing the excess water. Water was given whenever field moisture was limiting. After panicle initiation, the field was maintained with 5 inches of standing water. Water was removed 15 days before harvesting the rice.

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Unfortunately, because the crop was planted late, the resulting yields were disappointing, 1.97 to 2.73 t/ha. The tillering was, however, vigorous and impressive. The late planting date meant that only about half of the potential tillering, and subsequent grain filling, was achieved in these trials

2001 results at Metta Center

In this year Metta organized a season-long TOT course again for another batch of staff, held at its newly developed Center for Action Research and Demonstration (CARD) at Alam, Myitkyina. Along with other crop trials, a number of SRI plots were planted, but this time in a more systematic way and at the proper time, again in the wet season.

The trials were established in two separate plots of the field, each around 1,000 square meters. However, it should be mentioned that the soils of this field were terribly poor. Farmers who cultivated the land previously had abandoned it about ten years ago because of its poor quality. It was thus quite challenging to grow rice there, and farmers were keenly waiting to see whether we could grow any decent rice on this land.

A significant amount of compost and animal manure was applied to the field, but not more than 4 tons per hectare, and no chemical fertilizer was used. All other management practices in the trial plots were maintained as in the previous year's trials. Two varieties were used, both improved local varieties. All relevant field data were recorded on a weekly basis.

During the tillering stage, the growth of SRI plants was very impressive. The average number of tillers per plant was 19, with 42 the highest number in wider spacing. Tillering in SRI was 30% higher than in our FFS/IPM trials. Average yields of harvested rice in SRI plots measured 5.5 tons per hectare, 175% higher than from farmers' usual practice, and 37.5% higher than FFS/IPM practices with local variety, and 15% higher than FFS/IPM practices with improved varieties. The major differences between the FFS/IPM practices and SRI practices used in these comparisons were only seedling age and number of seedlings per hill because farmers had already begun to adapt the spacing, weeding and water management practices from SRI to their other plots.

2001 results in farmers' fields

Along with the trials in the CARD training field, the graduated alumni facilitators from our first TOT course implemented SRI trials at 30 Farmer Field Schools that they established and supervised in 2001. On average, each FFS had 10-15 farmer participants. The FFSs were spread over the entire Kachin State. The FFS trials were

conducted during the wet season—the only period when farmers grow rice.

The trials in each FFS were from 1,000-3,000 square meters. Farmers' traditional practices for growing rice in the area involve: use of very tall and old seedlings (45-60 days), transplanted densely and in a random way. They never use manure or chemical fertilizer. Seedlings are usually transplanted in a hill with 5-6 plants together and are grown in 2-3 inches of standing water.

Therefore, it was very difficult for FFS farmers to adopt all the practices of SRI. They, however, simplified the practices based on their local conditions. As a result, the practices that were used in the name of SRI differed among FFSs. The major SRI practices that farmers used in the FFS trials included: (a) use of 12 to 20-day-old seedlings; (b) a single seedling per hill, with a few FFSs planting 2 seedlings per hill; (c) wider spacing 20x20, 20x25 and 25x25 cm; (d) transplanting in lines, not (yet) in squares; and (e) application of some animal manure. Due to high rainfall in the wet season, most of the time the soil was saturated. All the trials in the FFS were monitored and supervised by the FFS facilitators.

The average rice yields in all of these 'SRI' plots were found to be higher than the yields of any other fields in the FFSs. Farmers in the FFSs even got higher yields with SRI methods than did our technicians at CARD, with some reaching 6.5 tons per hectare. This is, perhaps, because the soil quality in the FFS areas is better than that in the CARD training field. For purposes of comparison, the average yields of farmers in the FFS area range between 2 and 2.5 tons per hectare.

2002 evaluations

As all the previous trials were done in wet season, farmers found that keeping soil dry during this season was a big problem. This year, trials were started in the dry season. In February 2002, Metta began another three-month training course designed for farmers. Sixty farmer leaders have been attending this 'Farmer-led Extension' course, and they have planted half an acre of summer rice in the training field using SRI practices.

In addition, in the Mung Baw area of Shan State, Metta has been conducting action research. Due to the prolonged winter there, farmers grow only a single rice crop each year. However, they are interested to see if summer rice could be introduced by adjusting the planting period. In 21 villages, more than 12,000 farmers have been carefully observing SRI. This year in their rice cultivation, water has been managed more carefully, keeping the soil alternately dry and wet, and rotary weeders have been used to cultivate the soil.

Overall Results

For Metta, the first year was a learning year for the introduction of SRI. Although the yields were disappointing in 2000, the staff achieved confidence that the system can work. Subsequent results have been impressive. All 2001 data from the training field and from farmer's fields in FFSs demonstrated that the production with SRI methods can be 2-3 times higher than from farmers' usual practices in Kachin State.

Through the FFSs, Metta has been promoting IPM as an ecological approach to improve the production and productivity of farmers' rice fields. Field trials provide them and the staff with an opportunity to learn and to improve rice production systems. This means that many production methods are evaluated along with SRI. In all the trials, SRI yields have been substantially higher, 15-37%, more than with the best previous FFS practices.

Moreover, the uniform color and vigorous growth of SRI rice plants have attracted thousands of Kachin farmers, from both upland and lowland, to observe this new methodology. For upland farmers, the water-saving aspects of SRI are particularly attractive as farmers do not have enough water supply for their crops.

CARD serves as a demonstration center for the whole region. Thousands of farmers across Kachin State and Shan State now visit the center on a regular basis, some formally and others informally. For them, the major attraction has been the SRI field. In addition, each FFS has organized its own field day, and SRI was the center of attraction. Visiting farmers were given seeds from the SRI field which they could see were of good quality and pure. In the coming years ahead, many of these farmers are expected to practice SRI.

Learning

The major difficulties that have been faced are to maintain the planting depth of seedlings, and to level the field well. These practices are very essential for planting tiny seedlings. Planting seedlings deeper than 1-2 cm into the soil adversely affects their tillering; on the other hand, seedlings get washed away by water when they are planted too shallow. In both cases, seedling mortality is a problem. Therefore, gap filling must be done on a regular basis, which farmers feel is added work.

The requirement of labor with SRI is, of course, higher than with traditional practice. But this does not seem to be a problem when farmers have seen the tremendous increase in yields that is possible, unless there is some crisis of labor shortage in the area. In both Kachin and Shan States, rice is grown only in the

wet season, so sometimes excess water can be a problem for planting small seedlings in the fields.

Despite these problems, the approach of SRI is already bringing significant improvements into the overall system of rice production in our area. Since SRI requires a relatively small number of seedlings and thus only a small amount of seeds, farmer are taking more care in selecting good quality seeds for planting. They are thus producing better quality seedlings, which are a great improvement over traditional seedlings, which are taller, weaker and grown from seeds of uneven quality as no effort is made to select good seed.

In addition, the practice of using manure and compost in SRI has given another boost to our project, as it focused efforts on the improvement of soil fertility by using biological inputs. Farmers, usually, are reluctant to apply any manure or compost to their fields. However, when they practice SRI they feel obliged to use manure or compost, and get good results from their effort.

Prospects

Based on these results, project staff as well as farmers have become highly impressed with SRI, and therefore SRI has become an important part of Metta's FFS program. As of 2001, Metta had already trained 56 staff (FFS facilitators), and 60 farmer leaders are currently receiving training on SRI. Each of these facilitators and farmer leaders will provide training to 10-20 farmers each year based on the size of the FFS.

Integration of SRI into Metta's program will provide an extra opportunity to improve the yields of rice in the region where the program is working. We have found that SRI practices are supplementary to and improve upon the existing practices that Metta was promoting to improve the productivity of rice fields. SRI is not like introducing a new technology. The program, therefore, will continue to work on SRI and adapt the practices based on their suitability for farmers.

A Deputy General Manager of Myanmar's Ministry of Agriculture and Irrigation, after learning about SRI during a visit to Sri Lanka on an FAO mission in January 2002, has taken an interest in getting SRI evaluated more widely in his country. In June 2002, Norman Uphoff visited Myanmar, hosted by the Ministry and Metta Development Foundation, to meet with both Ministry officials and with farmers to disseminate an understanding of SRI opportunities.

My reporting at these sessions on our experience in northern Myanmar made the results reported from other countries more credible for those hearing about SRI for the first time. One Divisional Manager for the

Ministry has previously experimented with transplanting single young seedlings, widely spaced, getting good results, so there is already some active interest within the government in taking up SRI practices in other parts of the country.