

# SRI Experience of Association Tefy Saina in MADAGASCAR

*Justin Leonard Rabenandrasana, Association Tefy Saina<sup>1</sup>*

Association Tefy Saina (ATS) was created in 1990 to carry on the work of Fr. Henri de Laulanié concerning the rural development in Madagascar that he promoted after coming from France to his adopted country in 1961. Many of his students and friends joined ATS, especially to learn about and to disseminate SRI to farmers and NGOs as well as to government departments and others as much as possible. These members belonged to many other organizations, so the efforts of Tefy Saina were broadly diffused, with its members each doing work in other units on SRI and gathering to discuss results at an annual workshop in Antananarivo.

In 1994, a year before Fr. de Laulanié's death in June 1995, ATS began working with CIIFAD in the Ranomafana National Park Project (RNPP). At the end of 1995, ATS cooperated with the government's Department of Agriculture in the Ministry of Agriculture and Rural Development on an evaluation of SRI with support from the French development cooperation agency. The results of this evaluation are reported below. Subsequently, a French NGO, FERT, and the French development agency approached Tefy Saina to participate in some collaborative projects with them. Results from these project activities are also reported here, including some fairly spectacular results achieved in the region of Fianarantsoa by two farmers who got training from ATS regional technicians who have worked with Catholic churches in this region.

The national average rice yield in Madagascar is less than 2 t/ha, and the average amount of seeds used for planting is between 60 and 120 kg/ha. SRI techniques include: the use of less seed (just 5 to 6 kg/ha sown in a nursery only 0.01 ha, i.e., 1 are); transplanting young plants (8 to 15 days old, when they have just 2 leaves), planted one by one and with wide spacing (25 x 25 cm or more); and using less water.

The evaluation of yields by technicians and engineers has been done by measuring the harvest from 4 sample plots each 1 m<sup>2</sup>, one from a poor part of the plot, one from a very good part, and two from more typical parts. This is the standard method for estimating yield. Comparisons of the yield estimated by such means with that from fields where it could be calculated from total harvest have been very close. Indeed in the French-supported evaluation in 1996, the yield estimate from sampling was 0.1 t/ha lower than actual whole-field yields.

## Results from Ranomafana

Starting in May 1994, ATS provided technicians and supervision to work with farmers in the peripheral zone around Ranomafana National Park as part of a USAID-funded project in collaboration with CIIFAD. Work started slowly because farmers were quite hesitant to adopt practices that are so different from those that they are accustomed to. The first year's results were already very encouraging as shown below. This average yield held up over the following four years that ATS was able to continue working with farmers around Ranomafana.

Number of farmers: 39  
Area of SRI rice fields: 5.68 ha  
Rice field average/farmer: 14.56 ares  
Total seed requirement: 35.34 kg  
Production: 46.86  
Yield average: 8.25 t/ha

Those farmers who were of Betsileo ethnic origin (28) and who were more used to irrigated rice production were more able to utilize the new system. Also, they had somewhat better water control. On their SRI fields, which totaled 4.56 ha, they had a yield average of 9.18 t/ha. Subsequently the use of SRI began to spread.

---

<sup>1</sup>The author is Secretary-General of Association Tefy Saina. The postal address for ATS is: SLAE 33 – Ambondrona, Box 1221, Antananarivo 101, MADAGASCAR. Its E-mail address is: [tefysaina@simicro.mg](mailto:tefysaina@simicro.mg)

## NGO Report: Madagascar

The next year, 1995-96, the results were :

At higher elevations:

Number of rice farmers: 37

Rice fields: 10.5 ha

Total seed requirement: 67.38 kg

Production: 91,727 kg

Production average: 8.741 t/ha

At lower elevations:

Number of rice farmers: 33

Rice fields: 9.4 ha

Total seed requirement: 7.75 kg

Production: 7,657 kg

Production average: 8.078 t/ha

From 1997 to 2000, the number of cooperating farmers continued to increase around Ranomafana, reaching 275 in 1997-98, after which time, the channels for USAID funding were changed and ATS work in the region was disrupted. Over 800 farmers had signed up to participate with ATS in the 1998-99 season before technical assistance was cut back. Even without as much advice and assistance, over 400 farmers practiced SRI in 1998-99.

Other donor agencies began supporting the process of SRI diffusion, including Foundation Tany Meva, and the Landscape Development Interventions (LDI) project of USAID. ATS was able to evaluate 212 rice farmers practicing SRI in Ranomafana region at the end of 2000. Farmers' respective areas of rice fields under SRI ranged from 1 are to 8 hectares.

The most impressive case was Ralainandrasana Honoré, a farmer who began using SRI in 1994-95, planting just one-quarter hectare (25 ares) with these methods. He now works with SRI on 12 hectares, having extended his rice fields year by year, buying or renting other areas with the profits from his SRI production. Technicians have calculated Honoré's average yield as 8 t/ha, which gives him an income of 8 million Malagasy francs (Fmg) per hectare. By comparison, farmers using the System of Improved Riziculture (SRA) that the government promotes, which requires purchase of high-yielding seeds and chemical fertilizer, have average yields around 3.5 t/ha, with an income of about 3.5 million Fmg/ha.

Honoré's costs of production are somewhat higher per hectare (see FOFIFA report), but his net profits are much higher because of greatly increased yields. With his increased profits, Honoré has built three houses, one in Fianarantsoa and two others in his village, in addition to acquiring more land. We discuss below some of the farmer problems that were identified in our survey.

## Results in Madagascar's Highlands

In 1995-96, ATS trained 80 farmers around Antsirabe and 30 around Antananarivo with the support of technical personnel from the government's Agriculture Department, assisted by M. M. Louarn and Eric Bilger of the French aid agency. It is important to know that Antsirabe has volcanic soils so this area is more fertile than Antananarivo or Ranomafana. In Madagascar's highlands, elevations are between 1200 and 1500 m. Technicians supported farmers by making inquiries and filling in technical forms. The results can be summarized in terms of quartiles. Average yields with usual practices in these two areas were 3.9 and 3.2 t/ha, respectively.

### Antsirabe

25% of plots produced: 1,425 kg/ha to 5,250 kg/ha

50% of plots produced: 5,250 kg/ha to 9,400 kg/ha

25% of plots produced: 9,400 kg/ha to 18,090 kg/ha

### Antananarivo

25% of plots produced: 3,118 kg/ha to 4,900 kg/ha

50% of plots produced: 4,900 kg/ha to 7,600 kg/ha

25% of plots produced: 7,600 kg/ha to 11,810 kg/ha

Yields higher than 10 t/ha were obtained on 21% of plots in the first zone, and on 4% of the plots in the second zone. In Antsirabe, the total area of rice fields under SRI for this evaluation was 6.78 ha with an average of 0.85 ha/farmer, while around Antananarivo, it was 3.56 ha with an average of 0.12 ha/farmer. In Madagascar, it is evident that we are dealing with farming populations that are very land-constrained.

In the highlands, numerous new seed varieties like 1285, 1632 and 2787 have been introduced, but almost all farmers prefer local varieties which generally perform better than the new ones under local conditions. If farmers add any nutrients to their soil, they apply organic fertilizers (usually compost) as few use chemical fertilizers. We have found that some of the new varieties, such as 2067, perform particularly well with SRI management practices. The very highest SRI yields have come with such varieties.

## Results on the West Coast

In 1997-1998, with support from the French development agency, ATS worked with the French NGO, FERT, for two rice seasons: a wet season (November 1997-May 1998) and the following dry season (June-October 1998). Each season there were 140 cooperating farmers which produced 280 results dispersed across 7 agroecological zones around Morondava where rice is

grown on alluvial soils, and farmers never used chemical fertilizer. After training given by ATS, farmers practiced SRI with the following results:

### Wet season

This season is warm (25° to 33°) and also rainy, thus there is much water available. The average area on which farmers experimented with SRI this season was 2.15 ares. Farmers were already using the government's recommended System of Improved Riziculture (SRA), transplanting improved-variety seedlings 30 to 45 days old, using a weeder but little manure. Below we give a comparison of farmers' SRI yields with those from the 'improved' system:

Zone	SRI (t/ha)	SRA (t/ha)
1 <sup>st</sup>	4.77	2.19
2 <sup>nd</sup>	4.00	2.91
3 <sup>rd</sup>	3.79	3.26
4 <sup>th</sup>	5.58	2.53
5 <sup>th</sup>	4.75	2.41
6 <sup>th</sup>	4.35	2.04
7 <sup>th</sup>	3.43	1.85
Average	4.38	2.45

SRI results were consistently superior to those with SRA methods, averaging 80% higher, though they were not as high as seen elsewhere in Madagascar. This is partly because of the poorer soils in the region, but more important, there was too much water in the fields this wet season. SRI methods work best with a minimum of water.

### Dry season

Here are the average yields from a season in which there was no rain, and rice cultivation depended entirely upon irrigation, so water supply could be controlled.

Zone	SRI (t/ha)	SRA (t/ha)
1 <sup>st</sup>	7.15	3.05
2 <sup>nd</sup>	9.11	3.32
3 <sup>rd</sup>	5.14	3.54
4 <sup>th</sup>	6.62	3.47
5 <sup>th</sup>	6.71	3.41
6 <sup>th</sup>	7.70	4.30
7 <sup>th</sup>	6.03	3.37
Average	6.92	3.49

About a half of farmers doubled their yield or more, with some getting three times more for the season. Average yield with SRI was practically doubled (97% more) compared to SRA.

25% of plots produced: -55% to 52% of SRA average (average = 24 %)

25% of plots produced: 52% to 91% of SRA average (average = 72 %)

25% of plots produced: 91% to 133% of SRA average (average = 108%)

25% of plots produced: 133% to 366% of SRA average (average = 200%)

## Some Remarkable Results

A few farmers have been able to make this production system work extremely well, even better than Honoré in Ranomafana, who has been the most successful in economic terms.

- Our collaborators in Fianarantsoa have identified some spectacular results in the small village of Andriamalaza-Tsaranoro, 50 km south of Ambalavao, which lies south of Fianarantsoa. Ramampionona Pierre has practiced SRI on 30 ares (0.30 ha) having planted *Sesbania mancrata* on his rice field before his rice cropping. He cuts this leguminous shrub after harvest and spreads it on the area. The amount of rice that he harvested in 1996 from 4 m<sup>2</sup> has 9.37 kg, about 24 t/ha. The rice was a japonica variety 1632.
- Another farmer in the Fianarantsoa region, in the village of Soatanana, in Isorana district, who has gotten remarkable results is Ralalason, who uses compost very effectively. Here are his data from the 1997-98 rice season. He planted all of his very small holding, one-eighth of a hectare (13 ares), with SRI methods. These results are from his sixth year of using these methods, having gotten about 10 t/ha the first year he tried them. He has gained skill and confidence in SRI year by year, and the quality of his soil has improved as he puts about 5 tons of very well-made compost on his fields for the inter-season crop that precedes his rice.

Surface area: 13 ares  
 Hills per m<sup>2</sup>: 4  
 Fertile tillers per m<sup>2</sup>: 280  
 Yield: 21 t /ha  
 Distance of planting: 50 x 50 cm  
 Tillers per hill: 80  
 Grain number per panicle: 260

## Labor Requirements

As part of the evaluation project on the west coast (Morondava) with FERT, Frederic Bonlieu, a French agricultural researcher, analyzed SRI labor requirements. He calculated that the amount of additional time required for SRI practices was around 500 hours/ha. As the wage for agricultural labor is about 1,000 Fmg per hour, the additional labor costs with SRI for the 70 farmers studied was about 500,000 Fmg. One kg of paddy sells for about 1,000 Fmg at harvest time — and twice that much some months later, when the price rises from its harvest-time depressed low. Thus the additional labor for SRI can be repaid with increased production of 500 kg/ha (or even half that much if the farmer can afford to delay selling his harvest). Bonlieu found that for the average increase in yield with SRI practices was 1,930 kg/ha in the wet season and 3,430 kg in the dry season, many times more than the increased labor costs for using SRI methods.

## Problems

Training farmers about SRI is easy, but they can have many difficulties in practicing it because they cannot leave suddenly their traditional customs for many reasons. In our Ranomafana survey to assess difficulties of adoption, farmers answered our questions this way:

- SRI is so new for us; we don't like to practice it because it needs much attention and it is too complex.
- During the rice-growing period, we don't have money to pay for the extra SRI work.
- We don't have enough money to acquire a rotary pushweeder.
- Most of the men must migrate out of the village to get a paying job, so there is a shortage of labor for practicing SRI.

Indeed wherever farmers have rotary weeders they are deciding to go ahead with SRI if they are assured of having reliable technical advice.

Henri de Laulanié said that “Those having an agricultural vocation should go ahead [with SRI], persevering, and other farmers will follow them little by little.” There can be adoption at first, and then disadoption, and finally readoption after several hesitations. The Malagasy territory is still large and in total not densely populated (25 inhabitants/km<sup>2</sup>). Malagasy farmers are still mostly in a situation of subsistence economy, not yet fully integrated into an economy of exchange. SRI has expanded greatly since Tefy Saina began its efforts in 1990, but we still have a long way to go.