

# **Report on SRI Development Work of Oxfam Australia (OAus)**

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## **1. Introduction**

Oxfam Australia has been working in the Lao People's Democratic Republic since 1989. It has a long-term development program focusing on the livelihood development for rural poor in disadvantaged and remote areas of Laos.

The program has gradually expanded, and currently includes a range of rural development activities with gender sensitivity, disaster risk reduction, agricultural extension, water resource management, health prevention and HIV/AIDS support, micro-finance, informal and formal education.

## **2. SRI development work**

One among alternatives for increasing rice production is the System of Rice Intensification (SRI) that was developed in the 1980s in Madagascar and that is being tested in many countries around the world.

Oxfam Australia is confident that SRI is a promising approach to the improved rice production in Laos. Therefore, it is currently encouraging and promoting the use of SRI in close collaboration with its partners as well as farmers within and beyond target areas.

### **2.1. The use of SRI in the rain-fed rice cultivation**

After self-learning from messages on SRI provided by Prof. Norman Uphoff, CIIFAD, in the wet season 2001, OAus launched the first on-farm trials of SRI in two project areas, Feuang district in Vientiane province in northern Laos, and Ta Oy district in Saravan province in southern Laos. The result of the first trials was 3.73 tons per hectare, which was 16.5% higher than the national average rice yield (3.2 tons/ha) in 2000.

After this, farmers have learnt about and understood basic principles of SRI through farmers' day and SRI evaluation workshop co-organized by concerned local partners and OAus team. A total of eight farmers, including the first two families who started with SRI trials, experimented with SRI methods in the wet season 2002. The second group of SRI farmers come from Nawan village of Feaung district of Vientiane and 5 villages of Toumlane district of Saravan province.

The total experimentation areas were 2,003 square meters, and the output was 4.65 tons/ha, of which the average yield was 5.18 ton/ha from the 5 villages of Toumlane district, while from Nawan village of Feuang district the average was 4.12 tons/ha.

Due to non-availability of data on the national average yield that year, there was no comparison made. However, the average yield from 5 villages from Toumlane district was 81% higher than the average yield of Saravan province (2.86 tons/ha) and 107% higher than the average yield of Toumlane district (2.50 tons/ha).

The SRI result of the farmer in Nawan village was affected by rice gall midge or onion shoot which are serious pest problems for the rain-fed rice cultivation in the northern part of Laos. But Mr. Xiengleua as the first SRI farmer for OAus said that his harvest was still good compared with other farmers in his village. Usually, when the rice gall midge pest occurred, he wouldn't get any harvest at all in some plots. He observed that rice plants grown with SRI methods are strong and have a huge number of tillers. That is why that not all of plants died due to this pest.

In the wet season 2003, there were 26 families who applied the SRI method from 4 villages of Feuang district of Vientiane province, 5 villages of Toumlane district of Saravan province, and 2 villages of Thateng district of Sekong province in southern Laos. The total SRI area was 25,909 square meters (2.5 ha) and the average yield was 5.25 tons/ha.

For rain-fed rice production in the wet season 2004, 50 farmers' families applied SRI methods on a total area of 96,604 square meters (9.6 ha). These 50 families come from 4 villages of Feuang district and 3 villages of Met district of Vientiane province, also 5 villages of Toumlane district and 2 villages of Ta Oy district of Saravan province.

The results varied from place to place. In Feuang district, the average yield was 5.22 tons/ha, whereas Mr. Xiengleua in Nawan village has reached 6.73 tons/ha. The average yield with SRI in Toumlane district was 4.46 tons/ha, with Mr. Bounthan very satisfied with his output at 6.3 tons/ha. In Toumlane, the usual yield averages between 1.5 and 2.5 tons/ha. In Ta Oy, the average SRI yield was 3.15 tons/ha. There was no data recorded on the result of SRI in Met district due to the remoteness of villages where SRI was applied.

In the wet season 2005 and 2006, there was a regular record made by the farmers' group and technical staff members of the District Agriculture Office in coordination with OAus technical staff in the northern target areas of OAus. At this time, many former project sites have been withdrawn, like Toumlane district of Saravan province and Thateng district of Sekong province. Therefore, the only figure on SRI available is from the northern part of OAus target areas.

Three families of Phonsavang village of Feuang introduced SRI experimentation at on-farm level, while 18 farmers' families in Nawan used SRI methods for rain-fed rice production in the wet season 2005. The total area devoted to SRI was 107,300 square meters (10.7 ha) equivalent to more than half hectare per family in Nawan village. The average yield was 5.96 tons/ha. The three families of Phonsavang village made 350 square meters of their paddy field for SRI experimentation, and their output translated into an average yield of 6.28 tons/ha.

In the 9 villages of Met district of Vientiane province, 56 families tried to use SRI methods in the wet season 2005 on a total area of 82,400 square meters (8.2 ha) equivalent to 0.15 hectare per family. Their average yield was 4 tons/ha.

Seeing the potentiality of SRI and the visible on-going good output from Mr. Xiengleua, the SRI best practitioner, in the wet season 2006, 55 families in Nawan village alone have used SRI methods on a total area of 55 hectares. Their average yield was 6 tons/ha. Another 8 out of the total of 63 families in 4 villages of Feuang district applied SRI methods on the total area of 51,000 square meters (5 ha), equivalent to 0.64 hectares per families, and their average yield was 6.12 tons/ha.

Because of the late rain and of a long drought during the wet season 2007, on average only half a hectare per family has been used with SRI that year. In Nawan village, 51 families applied SRI for their rain-fed rice production on a total area of 27 hectares. Their average yield was 5.2 tons/ha, in spite of unfavourable weather conditions. Furthermore, at the same time, 17 families in another 9 villages of Feuang district used SRI in the wet season rice production on a total area of 16,000 square meters, but harvest is not yet gathered or reported.

In the same season, 32 families in 5 villages of Met district have used SRI for their rain-fed rice on a total area of 19,700 square meters. Their output was over 5 tons/ha on average.

## ***2.2. The use of SRI in the irrigated rice production***

Because Samoi district of Saravan province shares borders with Laos and Vietnam, it receives rain from both sites. The peak rain comes from the Lao site during the period August to September, whereas that from Vietnam come during October to November. This is why farmers here like to grow irrigated rice in the subsequent low rain season starting from December to April. This weather has been affecting rain-fed rice production, like low sunlight intensity during the ripening phase, resulting in low productivity.

In the dry season 2004-05, 3 families in 2 villages of Samoi district used SRI methods on a total area of 22,000 square meters with the result of 3.35 tons/ha on average. This SRI output was two-fold higher than the average yield in Samoi district (1.67 tons/ha).

Over the dry season 2005-06, 2 families in Avao village were the first families to experiment with SRI there. In the next season, they continued their use of SRI on a total area of 11,600 square meters (1.16 ha), equivalent to more than half a hectare per family. Their average yield was 4.3 tons/ha. It is interesting to note that SRI yields have been higher in rain-fed areas than in irrigated areas.

### **3. SRI extension approaches**

Based on practical experiences in terms of expansion of the use of SRI method for rice production in Laos, the following ways of SRI promotion have been working well:

- Farmer-to-farmer approach

In the beginning, only Mr. Xiengleua was the first farmer in Nawan village of Feuang district of Vientiane province trying SRI methods. Over 3 years of accumulated experience, he has shown off his on-going results. In the coming years, more than half of the total families in his village have been using for their own rice production.

Furthermore, different groups of outsiders came to his village to learn and share experiences with him. There were a group of farmers from non-target communities in the same district (Feuang) who visited, also a group of 18 farmers of Savannakhet province working with WWF-ComFish project including technical staff members, etc. Mr. Xiengleua was also invited by OAus, WWF-ComFish project to give training on SRI to other farmers in different places where others could learn and discuss on the practice of SRI

- Farmers' days

Many study trips on SRI were organized for farmers as well as for technical staff. Such trips took place mainly in areas where farmers have been using SRI. Looking at the SRI practice through farmers' days has made non-SRI farmers not just only understand the principles of SRI, but also impressed by what was seen. As a result, new learners are stimulated to try SRI methods later on.

- SRI evaluation workshop

OAus team and counterparts at district level have co-organized a workshop on SRI evaluation after the harvest each year. Present at the workshop were SRI practitioners and non-SRI farmers, technical staff members of the District Agriculture Office, and OAus team. Most important, Vice-Governors of the district, Heads of the District Agriculture Office, and Deputy Heads of the Provincial Agriculture Department attended this event. The latter participants represent decision-makers of the local government agencies, who then advocate the use of SRI within and beyond project areas. An indication of this is that a best practitioner like Mr. Xiengleua was invited to share information on his experiences at the Lao Party Conferences of district and provincial levels.

- Networking

Many organizations, projects and Lao government bodies have been made aware of the SRI promotion in the country. Recently, WWF-ComFish project in Laos was advised by Oxfam America about this. Discussions took place between the ComFish project and OAus team on the SRI development work of OAus. They then showed interest in learning about the SRI by organizing two study trips for their farmers as the one project partner to Nawan village. As a result, 4 farmers in Kaengdong and Taleo villages of Champhone district, Savannakhet province in the central part of Laos, have started with SRI experimentation in the wet season 2007. Moreover, approximately 5 to 8 farmers are now using SRI methods for irrigated rice production in the current dry season 2007-08

### **4. Lessons learnt**

With over 3 years of accumulated lessons and practical experiences of farmers who have been using SRI methods for rice production on their whole existing paddy land ranging from 0.5 to 1 hectare, their following learning can be summarized as below:

- Early transplanting

Farmers found that the transplanting with single young seedlings was difficult the first time. Today, they say that the young rice seedlings transplanting with SRI is no more a problem. And the time for transplanting has been reduced compared with conventional rice farming methods as the spacing with SRI is wider, at least 25 cm x 25 cm even up to 40 cm x 40 cm

- Transportation of seedlings

Mr. Xiengleua, the leading SRI practitioner in Nawan village of Feuang district, told us that his son-in-law is very happy with transporting of very young, not heavy rice seedlings to the main paddy field for transplanting. With conventional rice production methods, at least 25-day-old seedlings are used. In the past, he had to carry many thousands of bundles of older, heavier seedlings to be enough for transplanting one hectare. Today, they can save labour and time for the seedling transportation

- Intermittent water control

To reduce labour devoted to the implementation of wet and dry water control for SRI, farmers have kept a thin layer of water of 1 cm just after the transplanting. This also helps them to control weeds to a certain degree, meaning that with this water management, there are less weeds in the paddy field. During the vegetative phase, water is kept at a level between 3 and 5 centimeters.

- Weeding

Farmers understand that weeds become a problem affecting rice productivity not just with the use of SRI, but also with the conventional rice production methods. Until now, not much is heard from most farmers who have used SRI over two to three years about the problem of weeds. They say that it is not necessary to do weeding on the whole SRI paddy field. Weeding need depends on topographical location of the paddy field, on land preparation, and on water control. If the paddy land is uneven and not level, weeding needs to be done intensively. Good and thorough land preparation helps reduce the number of times to do weeding. Their innovation in water control for SRI by keeping a thin layer of water after transplanting puts pressure on the weeds' growth

### **5. A comparison between SRI and conventional rice production methods**

Based on information derived from many SRI evaluation workshops mentioned above, interviewing SRI farmers and non-SRI farmers, informal discussions with groups of farmers, etc., the following advantages of SRI compared with the conventional rice farming system can be summarized as follows:

	SRI	Conventional
Seed requirement (kg/ha) With SRI, 70 to 80% of rice seed can be saved and used as additional food for the family	10 to 12	60 to 70
Labour requirement for <ul style="list-style-type: none"> <li>• Uprooting seedlings from the nursery</li> <li>• Transporting seedlings to the main paddy field</li> </ul>	Less time Less time and easier, with reduced workload	More time More time, intensive labour, heavy work
Grain development	High percentage of fully formed grains	Relatively poorer
Quality of seed	Big, heavy and good seed for the coming season	Need to take time to do a selection of seed for the next season
Shape of panicles/ears	Shape of ears from main and sub-tillers are uniform	Big difference is noticed between main and sub-tillers
Harvesting	Easily to harvest as grains are ripening at the same time	Grains from main and sub-tillers are unevenly ripened. This leads to harvesting of both fully and not fully ripened grains

## **6. Limitations of SRI**

Not all agriculture technologies developed by agriculturalists, scientists and specialists can be widely applied everywhere. The use of SRI has some limitations, like the location of paddy field, types of the land, etc.

If the paddy field is located in the middle of large areas of neighbouring farmers, it is difficult to do the desired drainage or to keep water at a thin layer of 1 cm after the transplanting. Land along the banks of rivers, creeks and streams is not applicable for SRI, because it becomes inundated during the rainy season.

Types of land like marshes seem to be problematic for the use of SRI as drainage is not possible there. The use of SRI to cultivate rice on an uneven low land is associated with problems of weed infestation. That is why more labour would be required to do weeding on such fields.

## **7. Conclusion**

SRI is a low-cost, environmental-friendly method of rice production. What contributes to low cost are the saving of a huge quantity of seed, non-use of agro-chemicals, and use of less water with a good harvest.

It is environmentally sound because there is no need for pesticides, synthesized chemical fertilizers, or herbicides to increase rice production.

Over five to six years, SRI methods have been experimented with in on-farm trials and used for rice production in some target areas where Oxfam Australia is working. There has been quite a long time now for learning about, gaining experiencing with, and adapting the principles of SRI to the real situation in Laos.

Those farmers who have been using SRI for rain-fed rice production in Feuang and Met districts of Vientiane province can cover their family's rice demands year-round (Quoted from the 3-year project progress report). Some of them can increase their household income from their rice surplus year by year. For example, in the past Mr. Xiengleua sold around 1 to 2 tons of the family's surplus rice in the past. Today, his family is able to sell 1.5 to 2.5 tons each year.

Farmers in Samoi district of Saravan province, who have used the SRI method can attain rice self-sufficiency. In addition, they can reduce the upland rice growing areas to a certain level. This results in environmental protection in terms of not expanding the slash-and-burn cultivation.

Therefore, OAus together with its farmers will continue to find out suitable SRI methods for different areas. We are developing and designing integrated rice-based farming systems with SRI methods for poor families having less land in the future.