

## Experiences with System of Rice Intensification (SRI) In Cambodia from 2000-2007 Yang Saing Koma<sup>1</sup>

### 1. Introduction

System of Rice Intensification (SRI) was developed in Madagascar in the 1980s. The SRI ideas were then introduced into Cambodia in 1999 by the director of CEDAC, a national NGO, with farmer-based field experimentation starting in 2000. In that year, only 28 farmers were willing to participate in the evaluation of SRI. By 2006, nearly 60,000 farmers were using SRI, and it is expected that this number would increase to more than 80,000 in 2007 (there are about 1.8 million rice farming households in Cambodia). Due to the significant contribution of SRI to improve the livelihoods of rice farmers and the environment of the country, the Cambodian Government has officially endorsed SRI in 2005. Moreover, in 2006 SRI was incorporated into the National Development Plan (2006-2010)

### 2. The principles and practices of SRI

The goal of SRI is to create optimal conditions for growth in **roots and tillers**. As root growth increases, there will also be more tillers and more grains per plant. The basic SRI ideas or principles include:

- Growing healthy, vigorous and **younger seedlings** for transplanting by using **healthy, full-grained seeds** which are sown in the **upland nursery bed** (similar to that of a vegetable bed)
- **Wider spacing** between each rice plant, preferably with *one seedling per hill and with wider and equal spacing between each hill*
- **Shallow** transplanting (just 1-2 cm deep)
- Improved **soil aeration** by avoiding continuous field saturation with flooded water
- Frequent **weeding** to control weed competition and for active **soil aeration**
- Increased **organic matter** in the soil through application of compost, which increases **soil biological activity**



Figure 1 : Transplanting young and one seedling

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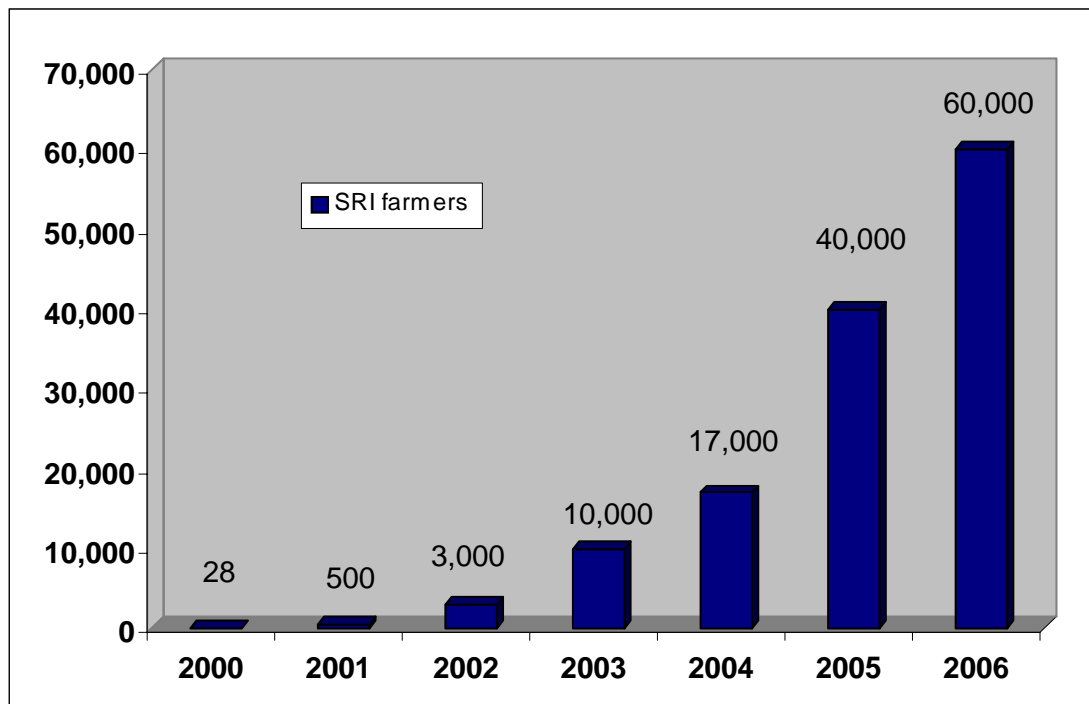
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The recommended SRI practices include: *raised unflooded seedbed; selecting only good seeds for sowing in the nursery and strong seedlings from the nursery for transplanting; using younger seedlings (preferably 8 to 15 days for the short-term variety, and 8 to 20 days for medium- or long-term variety) transplanted immediately after uprooting; fewer seedlings and preferably just one seedling per hill; shallow and careful transplanting; wider spacing between plants, preferably transplanting in a square pattern to expose plants more to the sun and air and to facilitate weeding; keeping minimum water levels in the field when transplanting and during the vegetative stage of rice growth; early and frequent weeding (to aerate the soil as well as to remove weeds); and application of compost, as much as possible.* Some of the above-mentioned SRI recommended practices go against generally-accepted beliefs. For example, rice farmers are used to transplanting older seedlings (more than one month), many seedlings per clump (more than five), placing the roots in very deeply when transplanting, and waiting for the field to be flooded with water before transplanting.

### 3. The progress and impact of SRI adoption and adaptation

As mentioned above, SRI was tested by farmers in 2000. During the last seven years, with support from CEDAC and other government and non-government organizations, the number of farmers involved in testing and using SRI has increased to more than 60,000 in 2006 (please refer to figure 1).

**Figure 1: Progress in the number of SRI farmers in Cambodia**



In order to highlight the benefits of SRI for farmers, data obtained from several selected evaluation studies are presented as follows:

- Data from 120 farmers monitored by CEDAC in 2003, have shown that with SRI methods, rice yields on average are 2.75 t/ha -- compared to 1.34 t/ha with

conventional methods; and the net income from rice per hectare has increased from around 58 \$US per ha to 172 \$US per ha.

- An evaluation study conducted by GTZ in 2004 showed that an average increase in yield of 660 kg/ha, or 41% (from 1,629 kg/ha to 2289 kg/ha), while **gross profits per hectare** went from \$US 120/ha with conventional methods to \$US 209/ha with SRI methods, an increase of \$US 89 or 74%. This consisted of a \$US 23/ha saving in variable costs such as seeds and mineral fertilizer, and an increase of \$US 66 in the income coming from higher yield.
- In early 2007, the CEDAC team interviewed 2,304 farm-households that had cooperated with CEDAC for more than 3 years. Results show that 70 % of them are practicing SRI methods. Among SRI users, 25% of them are able to successfully apply SRI ideas in most or all of their plots. On average, their total household rice production has increased around 110 percent. The amount of fertilizers has been reduced by more than 50% and the amount of seeds reduced by 70-80%. Also, 13% of farmers interviewed have stopped using pesticides and 7% have stopped using chemical fertilizers on rice and other crops.



Figure 2: SRI rice plant 3 weeks after transplanting of one seedling

CEDAC's experiences with SRI in Cambodia in the last seven years have shown that if farmers can adopt all, or most of SRI principles and techniques they are able to benefit from increased rice yields by more than 2 to 3 times. The best SRI users are able to obtain 4-6 tons per hectare or more. But if they cannot adopt all, or most of the principles and techniques, just by reducing the number of seedling used per clump, the age of seedlings, and the depth of transplanting, they can achieve a significant yield increase (around 30 to 50%) and also save seeds (which is important for poor households).

#### **4. Conclusion and future perspectives**

SRI has shown itself to be an appropriate solution for millions of small-scale rice farmers in Cambodia as it enables farmers to increase their rice productivity by using local existing resources. But SRI does not only enable subsistence rice farmers to have more rice. It also creates opportunities for them to enter the market as well as to diversify their farming systems. For example, with a rice surplus, farmers are willing to devote part of their rice field for diversification; to produce more fish, vegetables, beans and fruit. Many SRI farmers are now forming organic rice groups and cooperatives for collective marketing. For the benefit of farmers and the environment, it is important that SRI knowledge and experience be further developed and widely shared with all rice farmers in Cambodia.