



Farmers Leading the Way from Crisis to Resilience

Global Farmer Perspectives on the System of Rice Intensification (SRI)

Farming Practices to Improve Family, Community and Environmental Well-being



“My children are now in good health. With my rice profits we eat not just more rice but more meat, fish, vegetables and beans.”

Improving Livelihoods

Moussa Ag Demba

President, Goundam District Cooperatives Federation, Douékiré, Mali

Moussa Ag Demba was born in 1960, in Bagadadji, district of Douékiré, Timbuktu Region, Mali. His family relied on subsistence farming, and it was a daily struggle to meet their basic needs. As a young man, in the face of prolonged drought, Moussa was forced to migrate to other parts of Mali and as far as Libya in search of more fertile lands and odd jobs to supplement the family income. With the death of his mother in 2000, Moussa returned permanently to his home village to take care of his family and try to

re-establish a livelihood in farming. Moussa's enthusiasm, leadership qualities and organizational skills have made him very popular within the community. He was elected president of the Agricultural Cooperative Society of his village, president of the Union of six Agricultural Cooperatives in the Kessou area, and most recently, president of the Goundam District Cooperatives Federation.

In 2005, with the help of Africare, villagers constructed an irrigation system with a perimeter of 30 hectares to produce rice, wheat and onions. When SRI was talked about first in 2007-2008, Moussa embraced the idea of testing it. Africare proposed that five farmers from 12 different villages, for diverse geographic coverage, participate in on-farm trials. Despite reluctance on the part of his fellow farmers, Moussa organized and led the implementation of SRI tests with 15 farmers in his area of Bagadadji in 2009. He guaranteed that he would take all necessary steps to

ensure that the test plots were installed properly, even covering any extra costs personally. Farmers grouped their SRI plots in one location, and helped each other in the technical steps.

Today, Moussa harvests 9 tons of rice per hectare compared to 4-5 tons before the introduction of SRI. According to Moussa, with these significant increases in yield, his household no longer experiences food insecurity. He is able to sell about 6 tons of his rice output, using the profit to meet the basic needs of his family, including a healthier and more diverse diet. His children are no longer malnourished. And, since SRI is less labor intensive, he has more time to spend with family.

Moussa now helps to organize and train his fellow farmers in SRI farming techniques. Moussa has also been elected the 1st Deputy Mayor of the rural district of Douékiré and he is a member of the Regional Consular Office of Agriculture of Timbuktu.



Moussa organized all the farmers and led the implementation of SRI techniques.



"As our investment in SRI is less than before, and our net profit is higher, we bought one buffalo and a cow and settled our debt to moneylenders. By selling milk we can add further to our income."

Increasing Options

Duddeda Sugunavva

Farmer, Katkur village,
Warangal District,
Andhra Pradesh, India

For 38-year old Sugunavva, her husband Ailaiah, and their three daughters (ages 20, 18 and 15), farming is their sole source of income. Their village is part of the semi-arid region of Telangana and has very limited surface water irrigation. Farmers mainly depend on ground water, which is now being excessively pumped to grow crops like rice. Sugunavva owns 1.5 acres of dry land with no possibility for irrigation. The family grows crops like maize and red gram only during the rainy season, and the land remains barren during the rest of the year. She has leased two acres with access to a bore well to grow irrigated rice, and is able to harvest two rice crops a year.

"We are paying a lot of money to educate our children, and the increasing cost of living has made life difficult for us," she says. "Earlier we used more pesticides and chemicals for protecting plants from pests and diseases, and year by year this investment increased, but the yields remained the same. I have taken money from money lenders at high interest and every year this added to our problems."

Sugunavva learned about SRI in November 2007, when representatives from the local NGO, CROPS, supported by the WWF-ICRISAT Project, met with farmers and called for a Panchayat (village level) meeting to introduce and discuss SRI methods. She was immediately intrigued but her husband refused to consider adopting the methods. However, after they both visited a CROPS demonstration of SRI in a neighboring village and observed the results for 10 farmers on 25 acres, they agreed to try the new methods.

To begin, she only applied the techniques to five guntas or about one-tenth of an acre.

But after harvesting six 70-kilo bags rather than the usual four bags from that area, she extended SRI to the entire two acres. Before, using conventional methods, she harvested 35 to 40 bags of rice from one acre (2.8 tons/acre), which is the same as the district average. With SRI practices, she now gets about 55 to 60 bags (4.2 tons/acre), and has reduced her costs by Rs. 5,000 (about US\$110) per acre.

While she needed a couple of seasons and some additional training to feel entirely comfortable with the methodology, she now finds it easy. With SRI methods Sugunavva uses 30 to 40 percent less water. Other benefits she cites are improved soil fertility, reduced pest problems, lower seed use rate, good quality seed, good animal fodder, and the rice can be harvested about 10 days earlier.



Sugunavva now volunteers her time with CROPS to promote SRI and training other farmers.



"I'm proud to see farmers in my community increase their income and improve their living conditions."

Catalyzing Community

Le Ngoc Thach

President, Dai Nghia Cooperative,
Ha Noi Province, Vietnam

Watching his parents' rice crop destroyed by stem borer grubs in 1984 was a heartbreak for Le Ngoc Thach. When he was elected president of the Dai Nghia commune agricultural cooperative in 2001, just south-east of Vietnam's capital, Hanoi, he made a commitment to find new technologies to help farmers improve their livelihoods.

Thach and other farmers have been concerned about the use of chemical fertilizers and pesticides in Dai Nghia. The fertilizers were actually decreasing soil fertility and making the rice plants more dependent on artificial fertilizers. Pesticides used to kill pests, such as stem borers, also killed beneficial soil bacteria and other valuable species including fish. The rising prices of these chemicals forced them to find alternatives.

Oxfam and the Plant Protection Department, which is part of Vietnam's Ministry of Agriculture and Rural Development, have been running farmer field schools to help rice farmers learn SRI techniques. After participating in a farmer field school, Thach was excited about bringing SRI to his village. Despite his confidence, he knew there would be doubts among the farmers. For example, SRI

recommends transplanting single rice seedlings, instead of bunches of them. Many farmers did not believe this would increase their yield. "How can one rice seedling produce more than four or five seedlings together?" cooperative member Tran Minh Tien wanted to know when Thach introduced SRI in the commune in 2007.

But Thach made a bold promise to the farmers, "If you apply SRI and the yield is lower than the yield from your ordinary practice, I will take my own money to compensate for your losses." With this assurance, he convinced 50 families to try SRI on a 10-acre plot. Initial successes attracted more farmers. In less than a year, the number of SRI farmers in the commune tripled, and in the spring crop of 2008, all 750 families in the cooperative applied SRI on the entire commune's 420 acres of paddy land.

Growing SRI rice reduces farmers' reliance on pesticides. Thach says he can see the effects of less spraying of pesticides: "I think SRI creates a better biodiversity condition for the rice field. There are more fish and other creatures living in the field."

"I don't need to spend too much money on buying pesticide anymore," says Nguyen Thi Dua, one of the first women to try SRI in the commune. "The fields are looking good, and I'm pleased with the clean and sound environment."



Commune member Nguyen Thi Dua says her rice plants have stronger roots (SRI plant right), which reduces vulnerability to pests.

The Plant Protection Department has reported that on an average field just smaller than an acre, farmers can save \$53 per year for two rice crops on seeds, chemical fertilizers and pesticides, and on hiring labor for transplanting. The combination of input savings and yield increase contributes enough extra income to pay for one year of school or two year's worth of seed.

Moreover, those who used to spend

one month to transplant their rice now spend only 10 to 15 days. This allows them more time to do other work such as raising livestock or growing vegetables. "Now I have more time to become a seller at the market, and my husband has more time to work in construction," says Dua.

Farmers who used to grow barely enough rice for family consumption now have a surplus. "SRI has brought about a better life for Dai Nghia," Thach says.

Benefits of adopting SRI



Reducing Risk

Farm households, with few savings or other income options, are least equipped to cope with the volatility of input prices or to rebound when crops fail or livestock die. SRI methods and benefits give these farmers a suite of strategies to manage their risks and the capacity of their households and farming systems to recover from setbacks. This will be especially important as temperature and weather abnormalities become increasingly common in the future. Some of these benefits include:

- Higher yields per unit of land, labor and capital invested
- Lower production costs
- Reduced requirements for irrigation water
- Reduced reliance on chemical fertilizers, herbicides, and pesticides
- Increased resistance to pests
- Lightened workload, particularly for women
- Fewer seeds and accelerated planting schedule give more flexibility
- Earlier harvest due to earlier transplanting
- Increased drought tolerance
- Resistance to storm damage (from lodging or falling over), possibly also to cold spells
- Increased production and marketing potential from traditional varieties conserves biodiversity
- Higher productivity allows farmers to convert some land to higher value fruits, vegetables, and small livestock, for better diets and more income

For more information about the farmers profiled in this handout and SRI activities supported by Africare, Oxfam America and WWF contact:

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SRI and Climate Change

Changes in climate will affect rice production and thus have an impact on food security. Higher temperatures will increase crops' water requirements, so shortages will become more serious. Irrigated rice already accounts for 24-30% of the world's annual freshwater withdrawals. By 2025, 15-20 million of the world's 79 million hectares of irrigated rice lowlands --which provide three-quarters of the world's rice supply—are expected to suffer some degree of water scarcity. The International Food Policy Research Institute calculates a 12-14% decline in world rice production by 2050 due to the effects climate change.

Beyond increasing yields, SRI offers three major benefits that have significant climate implications if applied on a large-scale:

Reduced demand for water

With SRI methods, water use for irrigated paddy cultivation is reduced by 25-50%, making more water available for other crops, domestic uses or natural systems. SRI's lower water requirements mean that farmers can continue to grow rice in regions experiencing diminishing water availability. Moreover, the deeper root systems on plants grown using SRI methods make crops more drought-resistant.

Reduced methane gas emissions

Methane released from agricultural activities largely comes from inundated rice fields and ruminant animals, which together produce almost half of human-induced methane. Draining paddy soils periodically and maintaining them mostly aerobic, one of the main features of SRI methods, substantially reduces methane emissions.

Reduced use of nitrogen fertilizers

If current trends continue, the demand for synthetic nitrogen fertilizers (which are derived from petroleum products), is projected to increase by 65% by 2050, which would result in a doubling of nitrogen released into the atmosphere and waterways. High levels of nitrogen pollute drinking water sources with nitrate accumulations and can harm fish and marine ecosystems. With SRI methods, farmers can reduce the amount of nitrogen fertilizer they apply, as plants naturally develop stronger root systems that can better absorb nutrients in the soil. Organic matter can be applied to improve soil health and further improve nutrient use efficiency.



As competition for water increases, SRI methods are a promising opportunity to reduce demand for water from agriculture so it can be used for other domestic and environmental purposes (SRI field left; conventionally flooded field right).

For references see page 14 of the publication *More Rice for People, More Water for the Planet* at the Oxfam America website.