SRI: Helping Enhance Rice Productivity of Small Farmers

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There has been a decline in the per capita availability of food (rice) in the country. It reached an all-time low of 64 kg per annum in 2008–09, 20 kg less than the minimum annual requirement of a normal person (NSSO survey). With Indians being largely rice consumers, this declining productivity of the crop is of national concern.

To meet the nutritional needs of the people, food production has to be more than double of what it is. There are several factors affecting the productivity of food in the country. There are the biotic causes such as pests, weeds infestation, diseases and genetic decline, and the abiotic stress that includes problematic weather aberrations due to climate change such as flooding and drought, temperature fall, frost, submergence and cyclone. In addition, the country has to deal with year-to-year fluctuations in production and the fact that the sector loses around 40 per cent of its crop production annually, to system inefficiency and wastage. The loss affects household food security, particularly among the small and marginal farmers and the poor.

The picture becomes grimmer because of the stagnation of land under food crops. The pressure of increased population and the spate of urbanization add to the problem. The focus has to be on increasing the productivity of the land, to ensure food security at various levels (global, national and household levels). The smallholders in rain-fed areas, where a majority of the hungry people live (79 per cent of the poor in India live in rain-fed areas), are vulnerable to the low-level productivity trap as well as violent price volatility.

Low productivity and the large regional disparity in yield imply that there is enormous scope to exploit the vast untapped potential and increase production to bridge the yield gap. The System of Rice Intensification (SRI) provides ample scope for enhancing productivity and breaking the yield barrier in smallholders' fields. The advantage is that SRI produces 'more rice with less input', thereby reducing the cost of production and, at the same time, conserving precious water and other

resources. An intrinsic feature of SRI is that it is a pro-poor option of household food security. SRI involves a set of common practices, which synergistically result in a higher yield per plant.

Norman Uphoff, a professor at Cornell University, Ithaca, US, is fully convinced about the role of SRI in meeting the food security needs of the poor and has devoted his time to promoting its adoption and creating awareness about it globally. The origin of this simple technique can be traced to Madagascar where SRI was first practised. This method has recently been introduced in India, where farmers have improved productivity by using less water while incurring no additional cost.

The government, the civil society and the NGOs have been promoting SRI on an unprecedented scale and at great speed because of the emphasis on capacity strengthening of the farmers. The innovative initiatives to introduce SRI have helped spread the message widely in rice growing districts. Nearly one million hectares of rice fields were brought under SRI in India in 2009–10. This innovative system of rice cultivation is an integrated package of agronomic approaches to exploit synergistically the genetic potential of rice plants; create a better growing environment (both above and below ground); enhance soil health; and reduce the input cost substantially. The phenomenal saving in seeds (90 per cent) and water (up to 40 per cent) has attracted farmers to adopt SRI. Gender participation in SRI is also very encouraging, and women, in fact, are taking the leading role. The benefits of SRI, as observed at the farm level, include:

- Higher net incomes (86–165 per cent)
- Lower costs (11–20 per cent), less labour
- Less water (22–72 per cent) and less use of energy for irrigation
- Reduced dependency on purchased inputs: seeds (80–90 per cent), fertilizers and pesticides
- Climate change adaptability (drought tolerance, resistance to storms, reduced pest damage, enhanced natural resource base)
- Conservation of biodiversity (good response from indigenous varieties)
- SRI is fundamentally 'pro-poor' and effectively oriented to the small farmers (< one acre).

Over three million farmers have adopted SRI practices across the various states in India. On an average, SRI gives an advantage of at least 1.5 tonnes per ha yield, which is a great source of household food security for small and marginal farmers. Apart from an increase in farm income, the SRI practice has the built-in advantage of improved soil health and provides organic rice.

Being a set of care intensive practices, the imparting of knowledge of the SRI technique is important. Hence, capacity building and awareness of the stakeholders are crucial. It is, thus, essential to strengthen the institutional framework, including the rural credit system, crop insurance, marketing and remunerative pricing policy to boost this rural livelihoods.

By integrating the existing rice initiatives such as the National Food Security Mission and the rice research conducted by various government-owned institutes, it is possible to derive efficient strategies for scaling up the

innovation to a larger scale. This requires innovative institutional architecture by converging public and financial institutions and civil society initiatives. The development of stress-tolerant rice varieties and farmer-friendly practices, keeping the location specifics in mind, will be a further boost to the effort.

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The SRI method is preferred by scientists for breeder seed production and the SRI rice seed is preferred by farmers. Therefore, the SRI seed should be promoted. Policy interventions that build on the resource conserving property could be a source of sustainability. By pushing the irrigation facility in the rain-fed areas through the introduction of methods of harvesting rainwater and exploitation of ground water in a conjunctive manner, sustainable food production can be achieved. As SRI is suitable in the *rabi* season, given the availability of controlled irrigation, the problem of *rabi* fallow may also be addressed. This is an opportunity and incentive for converting fallow areas into a productive resource.

CASE STUDY: SRI PROJECTS IN BIHAR

Thirty-three SRI projects are being implemented in the state of Bihar. These projects are at different stages of implementation. Success stories, based on field visits, interactions with farmers, and reports are summarized here.

Shri Ashok Mahato, Shri Suresh Mahato and Shri Viswaroop Mahato of Yogiveer village of Jagdishpur block of Bhagalpur district had never imagined that they could realize a rice yield of over 40 quintals per ha from their fields. But the introduction of the SRI technique has changed their perception. They now think that they are a class apart and are proud to be known as those who took the risk and participated in the SRI project, supported by NABARD.

Although Yogiveer village receives abundant rainfall and has good quality soil, the farmers were not able to harness the full potential yield of rice from their fields. The reason for this was attributed to unscientific agronomic practices such as the indiscriminate use of fertilizers, no use of pesticide or organic manure and little concern for weed management and transplanting techniques, resulting in a lower yield.

Initially, the farmers were reluctant to let go of the traditional method of rice cultivation and follow the SRI practice; gradually, however, they shifted to the SRI method after a series of training, awareness and capacity building programmes. An audio-visual programme on the SRI technique and a video show depicting the success stories of SRI in various places were helpful in changing the attitude of the farmers. Assistance in the form of inputs such as vermi-compost, cono-weeder and fertilizers acted as an inducement in the initial years; subsequently more and more farmers have started to adopt SRI techniques.

There are similar stories from the farmers of other villages districts such as Bhagalpur, Patna, Munger, Purnea, Banka and Gaya. Crop cutting studies conducted in the SRI project fields reveal an increase of 170 per cent in the yield of paddy, 130

per cent the yield of straw and 140 per cent in tillering. Farmers Clubs, promoted with the assistance of NABARD, in the past played a crucial role in mobilizing farmers. The level of mobilization in the project area is so high that the farmers have pledged to discontinue traditional methods altogether.

Farmers, who have larger land-holdings, think that except for the high labour requirement for transplantation, which can be replaced by low-cost mechanized transplanters, in due course, this technique has a lot of potential for large-scale adoption, leading to higher productivity and net income accrual.