

SRI - System of Rice Intensification

The System of Rice Intensification (SRI), developed in 1983 by Fr. Henri de Laulanie, has enabled farmers in many parts of the world to increase their irrigated rice yields to 6-10 tons/ha, and in some cases up to 15 tons/ha. SRI principles include capturing the plant's full potential for tillering by early transplantation, planting seedlings one by one and spacing them far apart, providing full potential for root growth by alternatively wetting and drying of the field, minimizing irrigation and early and frequent weeding. The differences between conventional with SRI practices are:

	Conventional	SRI
Seed requirement (kg/ha)	80 to 120	5 to 10
Transplanting after	20 to 30 days	8 to 15 days
Spacing (cm)	10x10 to 20x20	25x25 to 50x50
No. of seedlings per hill	3 to 4	1
No. of plants/m ²	75 to 150	4 to 25

farmers did not use any insecticide because the high number of tillers per hill compensate for damage inflicted on individual tillers. Some farmers did use fungicides for controlling leaf spots and neck blast, but these fungicide applications might be unnecessary if seeds are pre-treated with fungicide.

The experiences of Morang farmers with SRI was broadcast on national television and reported in national newspapers. Many farmers and development workers from different parts of the country contacted me after hearing the news to get more information about the SRI method. Since then we have published and distributed booklets and sent a special issue of our monthly newsletter on SRI to farmers, NGOs, District Agriculture Development Offices and others in the agricultural sector. All these efforts have created a very favourable environment for the development of SRI in Nepal. My proposal for a SRI promotion project was selected as one of the finalist in Nepal Development Marketplace 2005 organized by World Bank/Kathmandu, and awarded US\$20 000. During 2005 and 2006 the project will be implemented in Morang and Panchthar districts.

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For more reading on SRI, see LEISA Magazine Issue 15, Dec. 1999, pp 48-49; Issue 17.4, Dec 2001, pp 15-16; and Issue 18.3, Oct 2002, pp 24-29 (www.leisa.info).

A journey towards sustainability

M.N.Kulkarni and Prakash Bhat

Shri Nagappa Athergunchi, a farmer belonging to Kamplikoppa village in Hubli taluk of Dharwad district is one of those who is reaping immense benefits by following LEISA system of farming. Nagappa despite owning 2.5-acre land, was depending on farm labour for his livelihoods, sometime back. He was struggling to meet the family requirements. Lack of resources to take up soil and water conservation measures and lack of awareness regarding low cost, low external input sustainable agricultural practices forced Mr.Nagappa to give his land on share cropping basis. On this land, only pearl millet, hybrid sorghum, hybrid cotton, cowpea, green gram were grown. Practices like mixed cropping and crop rotation were never followed. He did not own any livestock and sold fodder. As a result, he did not recycle biomass and apply organic manure. The dependency on chemical fertilisers was therefore, high. He was using 100 – 150 kg DAP and 50-100 kg Urea per year. Dependency on fuel wood too was high. Nagappa was earning his livelihood, working as farm labour along with his wife, for nearly six months in a year. Many times he migrated to other areas in search of employment.

The Transfer of Technologies for Sustainable Development (TTSD) project of BAIF, an NGO working in that area, identified Nagappa in 1997, for promoting sustainable agricultural practices on his farm. SHGs were formed in the village, in which Nagappa was an active member. The project supported him with inputs such as Sapota and mango seedlings, ten to twelve species of forestry seedlings,

Nagappa's field – Integration of livestock, trees and fodder.



earthworms to start vermicomposting and in field bunding efforts. He also participated in study tours to BAIF campus at S.Lakkihalli, IGFRI farm at Dharwad and in various other training programmes pertaining to soil and water conservation measures, tree based farming systems and LEISA approaches. Following the support provided by the project, Nagappa started adopting various activities like tree based farming system, zero cultivation, vermicomposting, use of biological methods for pest and disease control, use of organic manures, crop rotation, biomass recycling etc.

Under the tree based farming practices, Nagappa planted fruit trees like sapota, mango, cashew, pomegranate, lemon, and moringa plants. He also planted about 1200 forestry plants of different species on his 1.5 acre. Sapota and mango plants have started yielding. He adopted zero cultivation. He also took up biogas unit and vermicompost production. Mixed and multiple cropping system, inclusion of fodder trees, horticulture trees and forestry trees in 1.5 acre upland improved the economic status of Nagappa.

Growing of fodder grasses such as *Stylosanthes hamata*, *Bracharia* sp. (signal grass), guinea grass etc., helped him to maintain two crossbred cows. The cows are stall fed in the farm itself. The costs incurred by Mr.Nagappa in maintaining the cows are limited to cutting the grass and feeding them. The dung produced by the animals is used in the biogas unit. The slurry and the remaining fodder is diverted to the vermicomposting pit located in the backyard. Vermicompost is being applied to the field. Nagappa has completely stopped purchasing chemical fertilisers and pesticides. The forestry plants planted during the year 1997 have started producing enough fuel wood as well as biomass. These measures have helped in improving the fertility status of the soil. Thus, the fodder and fuel needs are being totally met from his own farm.

To make use of abundant fodder available during rainy days, Nagappa generally buys a couple of livestock at Rs. 3000-5000 that are in milking stage but debilitated. The family consumes some milk and sells the remaining quantity. As the condition of the animals improve they are also artificially inseminated. Then they are sold for high prices ranging between Rs.10000-18000 per animal. As fodder is produced on the farm, this can also be considered as an income from the farm. This is how he integrates livestock into his farming system.

Nagappa has started to reap the fruits of low cost, sustainable agricultural practices. The input costs have gone down drastically as the only input which is purchased is the hybrid seeds from the market. The rest of the inputs- vermicompost, organic manure, fodder, fuel wood etc., are being produced on the farm. He does not incur any cost on ploughing or harrowing the land, as zero cultivation is practiced.

After three years of adopting LEISA practices, on an average, Nagappa earns Rs 20000/- per year from his land. Now, that the Sapota and mango plants have started yielding, his earnings since two years now stands at Rs. 50000 a year. Earlier he used to spend around Rs. 5000 annually towards hiring labour for irrigating fruit plants. But now, the family labour is fully involved, particularly for activities like basin preparation for fruit plants and pruning of forestry species.

The food grains produced in one-acre low land are used for home consumption, thus ensuring food security. When all the fruit trees start production, the income is expected to double.

Financially, what Nagappa earns today is much higher, even if the opportunity cost of labour is taken into account. (as a farm

The sustainability of his farming system was carried out using a tool called **quantification of farm sustainability**. According to this study, the sustainability of this farm was 17 before the project interventions in 1996 and today it has increased upto 80 (July-2004) resulting into a net increase of 63% sustainability. The major contributors for the increase of sustainability are the low cost, sustainable agricultural practices and tree based farming system.

labour he could have earned Rs. 7000/- to 8000/-, in six months at Rs. 40/ day). Finances apart, the social status which Nagappa has earned by working on his own land, cannot be quantified in terms of economics. *“The days of going to rich farmers for want of labour are over. Now, I am in a position to help others in need”*, says Nagappa confidently.

Kamalavva, Nagappa’s wife, is proud to be a part of this success story and says, “There was no recognition to my family before joining the project. Workload increased during the initial years for activities like watering trees in the summer season. But there have been a lot of benefits too”. In fact, Kamalavva feels that the drudgery is now reduced as enough fuel wood is produced for the household. Thus, the project intervention helped her to have clean kitchen, biogas, toilet etc. Moreover, the support and motivation provided by the project has helped her gain confidence. Now, she is an elected President for the Executive Committee of the watershed project in the village.

The farm also contributed a lot for the promotion of LEISA activities among the farmers within and around Kamplikoppa village. About 25 farmers in the village are adopting 0.02 to 0.03 ha land under zero cultivation and growing only fodder apart from growing fodder on bunds. Nagappa’s brother, Shri Shivappa has adopted zero cultivation in his 0.4 ha land. In order to promote and popularize this concept, the villagers have formed a group called “Nandini fodder growers association” and have organized fodder festival to motivate the other farmers.

His farm has become a model for zero cultivation and efficient energy recycling - fodder is fed to cows, dung goes to the biogas, slurry is composted (vermicomposting) and comes back to the field. Many farmers and officials from NGOs and the government departments used to visit his farm regularly and interact with him. This itself has given him a special place and status in his village.

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