



# SRI Fact Sheet - Punjab



Total geographical area (km <sup>2</sup> )	50,362
Total population (million)	24.4
Total cultivable area (million ha)	4.3 (2002-03)
Total paddy area (million ha)	2.6 (2006-07)
Paddy area (%) to total cultivable area	65
Major rice season	Kharif (Jun-Oct.)
Total paddy production (million tonnes)	15.2 (2006-07)
State's contribution to national paddy production (%)	16.3
Paddy productivity (t ha <sup>-1</sup> )	5.8 (2006-07)
All-India rank in productivity	1
Constraints in paddy cultivation	Water, labour, declining ground water levels and pumping cost.



## Background

Punjab is the bread basket of India. Wheat was the main crop until recently. Rice cultivation in Punjab is recent development. Availability of water, relatively rich soils, an innovative and hardworking farming community and market access have all contributed to the rapid growth of rice cultivation across Punjab. During 2006-07 the state cultivated 2.6 million ha of paddy (combined two crops), and produced 15.2 million tonnes. The area and production fluctuated in the last decade from 2.3 million ha to 2.6 million ha and 11.9 million tonnes to 15.7 million tonnes respectively. Average yields fluctuated from 4.7 t ha<sup>-1</sup> to 5.9 t ha<sup>-1</sup> (in 2006-07 it was 5.8 t ha<sup>-1</sup>) which is almost twice the national average.

- Availability of water, relatively rich soils, an innovative and hardworking farming community and market access had all contributed to the rapid growth of rice cultivation across Punjab
- During 2006-07, Punjab cultivated 2.6 million ha of paddy (combined two crops), and produced about 15 million tonnes.
- Because availability of water, which was actually the reason for the rapid growth of rice cultivation, has now become a major constraint, in 2008 the Government imposed a total ban on rice transplanted in summer
- In 2008, a total 225 acres of farmers' fields are under SRI in Gurdaspur district which is the beginning of the major transformation of rice cultivation in Punjab
- SRI is an ecologically sustainable and innovative approach, which will provide Punjab farmers the option of cultivation with greater yield and profits



Punjab produces 16 percent of the nation's paddy and most of it is exported to other states and countries, therefore it has strategic importance in terms of food security and earning foreign exchange.

However, rice cultivation is in big trouble in Punjab. Availability of water, which was actually the reason for the rapid growth of rice cultivation, has now become a major constraint. The situation is so bad that as of 2008, the Punjab government has imposed a total ban on rice transplantation



in summer, the season with highest yield and profitability, to prevent further decline of its ground water resources. Technology in pumping, electricity subsidy, lack of enforceable laws, lack of incentives to save water have all contributed to the rapid decline of ground water. In 2006, more than 30 per cent of farmers were using centrifugal pumps sucking ground water from great depths (30 m). Electricity consumption in Punjab for agricultural pumps is about 7,500 million kWh. The total electrical subsidy for agricultural pumps amounted to Rs. 24,000 million (US\$ 500 million), of that Rs. 15,000 million (US\$ 300 million) was for rice cultivation. Punjab purchases electricity worth Rs. 28,000 million from other states and spends Rs. 1000 towards electricity subsidy per tonne of paddy production or Rs. 5,700 per hectare of paddy cultivation. This will go high in coming years, as the water table goes down further and power rates shoot up.

So, there is an urgent need to improve the water productivity of Punjab rice cultivation to prevent economic loss and ecological degradation. Preventing farmers from cultivating is not a viable option since it will have political, economic and social ramifications not only in Punjab but across India. The food security of India depends upon Punjab. Therefore, Punjab farmers need alternatives to produce more rice with less water. The System of Rice intensification (SRI) is one such option which is proving very cost-effective and is rapidly catching the imagination of the innovative Punjabi farmers.

The entry of SRI into Punjab has an interesting story attached to it. Dr. Gurdial Singh, Joint Director, Department of Agriculture was introduced to the method in Hyderabad in 2005. After that, he along with a colleague Dr.



Amrik Singh, established three small demonstration plots under Agricultural Technology Management Agency (ATMA) and CSS support of the Punjab state extension programme. The results were shared by two farmers and two officials at the first national symposium on SRI held in Hyderabad in 2006. There they also interacted with others practicing SRI and got some more information and encouragement. A remarkable story of



individuals within the government system, who used their own initiative and worked hard with farmers to try and assess the SRI method, through initial field trials. In three years, from 10 farmers SRI is now being tried by 150 farmers. This year, in 2008, a total 225 acres of farmers' fields are under SRI in Gurdaspur district. A small area, but the results have attracted media, farmers and government officials to these SRI fields.

Surely this is the beginning of the major transformation of rice cultivation in Punjab. It is hoped that SRI will be adopted by thousands of farmers next year after they interact, with farmers who now have experience and knowledge having successfully adopted the method.

### Performance

The results of farmer's field trials in 2007 are very convincing. The average yield increased from 7.7 t ha<sup>-1</sup> to 9.8 t ha<sup>-1</sup>. The farmer's net income increased from Rs.44,001 per ha to Rs. 58,818 per ha . The results are summarized in the table below.

**Table: Economics of SRI vs Conventional Method (kharif 2007) (Rupees)**

S.No.	Component	Conventional Method	SRI Method
1.	Seed & seed treatment	327 (20 kg)	102 (5 kg)
2.	Manure & fertilizer	2,415 (275 kg urea ± 125 kg DAP)	3,695 (162 kg Urea ± 4 t FYM)
3.	Weedicide & insecticides	450	Nil
4.	Irrigation (diesel charges)	1,687 (26 times)	537 (14 times)
5.	Human Labour	3,000	5,312
6.	Tractor, harvesting, & marketing charges	6,992	6,072
7.	Total Variable cost	14,871	15,718
8.	Interest @ 9% for half year	1,338	1,414
9.	Total Cost	16,209	17,132
10.	Value of paddy harvested	60,217	75,950
11.	Net return	44,001	58,818

### Experiences in Adoption

Though SRI is in the initial stages, the farmers have responded very positively. Some issues related to its adoption are a) transplanting young seedlings b) draining of water from the field particularly when it is raining c) conoweeders, particularly the quality of the blades d) water-logging in low-lying areas e) availability of conoweeders.

Many established institutions such as the Agricultural University, are reluctant to take up any research or promotion of SRI. The local government in Gurdaspur district, where the farmer field trials are being conducted, is very positive about SRI and is extending all support.

## Way Forward

SRI is gaining momentous acceptance among Punjab farmers. In Gurdaspur district the experimental results so far are very impressive.

Given the major challenge for the government of Punjab - an alarming water crisis that is expected to further escalate due to climate change - what Punjab requires immediately is an ecologically sustainable and innovative approach, which will provide farmers the option of cultivation with greater yield and profits.

As mentioned above, the government of Punjab took some drastic steps last year: it banned rice cultivation in summer. The government is even reported to have taken serious measures against farmers who violated this order. Certainly the measure adopted is no solution and farmers are very unhappy.

Punjab has great opportunity to promote SRI. Punjab farmers in Gurdaspur and officials in the district are very receptive to this method. But in order to see the benefit of SRI - both increasing the production of rice in Punjab and significant reduction pressure on water resource, particularly during summer time - Punjab needs to adopt SRI on a large scale. And for that, the following specific support measures are required from the higher authorities:

- Specific targets to introduce SRI in all paddy-growing districts. A general target of converting at least 30-40 per cent rice cultivation in Punjab to the SRI method. At the same time the target should also include an increase in the paddy production of Punjab by at least 25 per cent;
- Prepare a detailed action plan in order to achieve this target;
- Initiate specific policy measures to promote SRI with incentives. For example allow farmers to grow paddy during the summer only through the SRI method. This way farmers will have an incentive to positively look at this method and invest (only small sums) to switch to this method;
- Provide enough financial and technical resources to train farmers on demand. This is worth an investment as part of their adaptation strategy for climate change;
- Establish a special unit with adequate resources and power to complete the targets;
- SRI requires tools – markers, weeders, small row transplanters etc. Punjab can take the lead in designing and producing them on a large scale not only for the state but also for the entire country. Developing appropriate tools is extremely important; and finally,
- It is possible to involve private sector in Punjab (this is unique to Punjab, since state produces rice to export to UK etc.) for promoting SRI so that they can have better market-access with special labeling.

Source for basic data in table and map : Directorate of Rice Development (DRD), Patna; Department of Agriculture and Cooperation Ministry of Agriculture, Govt. of India; Survey of India (Soil), Hyderabad

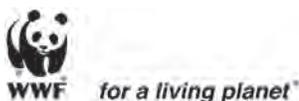
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