



System of Rice Intensification (SRI) 2011 Campaign Results & Recommendations



**Participatory Management of
Irrigation System Project
(PMIS)**



System of Rice Intensification (SRI)

2011 Campaign results & recommendations

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I. General information:

➤ On-farm trials with SRI volunteers:

In 2011, 114 farmers including 7 resource persons (RP) and 20 new volunteers have been applying SRI method for rice cultivation in 2 districts of Baghlan and Takhar provinces, as part of the **Participatory Management of Irrigation Systems (PMIS)** project, managed by the **Aga Khan Foundation (AKF)**. The project is part of the larger government-led **Panj-Amu River Basin Program (PARBP)**, which is funded by the **European Union**.

Participation	Districts		TOTAL
	Doshi	Taloqan	
Resource persons	2	5	7
New volunteer	0	20	20
SRI Farmers from last years	52	35	87
TOTAL	54	60	114

II. Methodology:

➤ Farmers technical support and PTD approach for on-farm trials:

In order to ensure that SRI volunteer farmers could get the necessary technical assistance and follow-up support in a learning environment, the following steps have been implemented:

1) Awareness-raising:



Photo 1: SRI Campaign in Kelagai, March 2011.

Before the start of the irrigation season, awareness-raising about SRI was carried out through individual and group meetings. During this process, presentation of results from 2010 and registration of volunteers were conducted. While RPs were also involved in the SRI awareness-raising campaign, PMIS-Baghlan did not have enough budget for SRI in 2011, so new volunteers were not able to be covered in 2011. PMIS provided technical support only for those farmers who tried SRI in 2010.

2) Formation of PTD groups:

Groups of volunteers were formed so that if any group of volunteers was faced with a technical problem, experienced SRI farmers (Resource Persons) and the System of Rice Intensification technical team could help them. SRI technical staff provided technical advice at every stage of the rice production process.

3) Technical assistance at field level from PMIS/SRI Team and for each stage of SRI method:

At each important stage of SRI, field-level demonstrations were organized for each PTD group, the RP and his volunteers being brought together at the RP plot. Technical discussions and practical demonstrations were carried out by PMIS/SRI Team with inputs from the RP to illustrate to the volunteers the tasks they would have to carry out to reproduce SRI results. Each session was concluded by small group discussion to summarize the learning points.

4) Replication of demonstrated practices:

Demonstrated practices were replicated by the volunteers themselves with assistance (if needed) of their RP. During the following meeting with PMIS/SRI staff, the volunteers were invited to comment and ask questions about remaining issues they faced in their fields.

5) Field days:

A field day was organized on one occasion for all volunteers from Baghlan and Doshi to see different fields and to share experiences. The farmers from Khan Abad Irrigation Scheme (KIS) belonging to PARBP came to visit SRI plots also. PMIS took advantage of this by bringing all SRI farmers together to visit the SRI plots.

PMIS organized an exposure trip for PMIS/SRI farmers of Baghlan to visit PMIS/SRI farmers' plots in Taloqan and Taloqan SRI Farmers to visit SRI plots of Kelagai. The farmers shared their experiences about SRI with each other.



Photo 2: PARBP staff and KIS/SRI farmers are visiting PMIS/SRI plots in Kelagai.



Photo 3: PMIS Baghlan SRI Farmers on an exposure trip to PMIS/SRI plots in Taloqan.



Photo 4: PMIS Taloqan SRI Farmers on an exposure trip to visit PMIS/SRI plots in Kelagai.

Suggestions on methodology improvements for the next 2012 SRI campaign:

- 1) The awareness raising campaign needs to start earlier for the 2012 campaign.
- 2) In 2012, the 3 DAIL staff that have been trained should be given responsibility to supervise one or more PTD groups again. Logistical and material support could be provided by AKF-A and SRI Resource Persons should be promoted as Supervisors while taking more responsibilities.
- 3) The SRI farmers should be trained in using compost and green manuring through PTD approach.



Photo 5: Demonstration for a group of SRI farmers on how to remove SRI seedlings from seedbed.



Photo 6: SRI farmer is marking SRI plot with a ruler marker.



Photo 7: SRI farmer transplanting SRI young seedlings at each intersection.



Photo 8: SRI farmer weeding the SRI plots, Kelagai.



Photo 9: SRI farmers and DAIL staff assessing crop development



Photo 10: Khan Abad Irrigation Scheme (KIS) SRI farmers visiting PMIS/SRI plots, Kelagai.



Photo 11: Khan Abad Irrigation Scheme SRI farmers and Kunduz DAIL staff with PARBP staff visiting PMIS/SRI Plots, Kelagai



Photo 12: Discussions on SRI practice among KIS/SRI farmers and PMIS/SRI farmers, Kelagai

➤ Procedures for measurement of results:

Measuring the harvest was done in the presence of (at least) the PMIS/SRI Team, the DAIL staff trained in SRI, the RP and the volunteer farmer. In addition, other DAIL staff and farmers were invited to witness the process and see the results.



Photo 13: SRI farmer throwing the 1m² frame in a traditional method rice plot.

The harvest was collected from representative samples from both the SRI plot and the neighboring traditional-method plot for comparison. In order to ensure that the results were representative for the entire plot, 3 samples of 1 m² were collected. Indeed, as a plot is not always even in terms of production, the volunteer and DAIL staff were asked to select 3 different samplings as follows:

First sample: 1 m² was selected from the best part of the plot in terms of production.

Second sample: 1 m² was selected from the worst part of the plot in terms of production.

Third sample: 1 m² was selected from a part of the plot which looks about average in terms of production. This ensured that the average was taken from 3 sampling results.

For each part, 1 m² is cut, which makes a total of 3 bunches (*Qaudah*). Note that with SRI practice, each m² represents 16 hills as 16 seedlings were transplanted with 25 x 25 cm spacing. Thus it is very easy to cut 1 m² of SRI. For the traditional-method plots, a 1m² metallic frame was used. Tossing the frame into the field helps to select precisely the hills which fall within 1m² (which can be between 17 and more than 30).

While in the field, the height of SRI and traditional plants is measured from 3 tillers in each sample. An average was then calculated from the 9 tillers measured.



Photo 14: DAIL staff and RP are harvesting SRI plots of Haji Abdul Khalil, Kelagai.



Photo 15: Measuring the height of a 1m² selected samples.

Using the bunches (*Qaudah*) previously cut, the following steps were carried out for plants grown with both the SRI and the traditional methods:

1. Count n° of **hills / m²** for traditional method (the total number of hills for 3 bunches (*Qaudah*) will be counted and divided by 3 to get an average).
2. Measure the **fresh weight / m²** (grain + straw).
3. Measure the **dry weight / m²** (grain + straw). This is usually done 1 day later than the measurement of fresh weight.
4. Count the n° of **total tillers/ m²** (the total number of tillers for 3 bunches (*Qaudah*) will be counted and divided by 3 to get an average per m²)



Photo 16: DAIL staff and RP weighing a SRI bunch.



Photo 17: DAIL staff, RP and SRI farmer counting SRI tillers.



Photo 18: PMIS/SRI staff and RP counting SRI tillers.

5. Count the n° of **grains / panicle**. For this, it is necessary to choose three samples of panicles (from the longest, medium and shortest panicles) from each sample of cut m². The total will be divided by 9 to get an average per m².



Photo 19: Fawad Hussain, DAIL staff, counting SRI grains per panicles.



Photo 20: DAIL staff and RP counting SRI grains per panicles.

6. Measure the **total weight of grains / m²**. The grains from 3 bunches (*Qaudah*) will be weighed together and the result divided by 3 to get an average.
7. Measure the **net weight** (after separating the empty seeds) of **grains / m²**.



Photo 21: DAIL staff and RP weighing SRI grains/ m².



Photo 22: The comparison photo, traditional on the left and SRI on the right.

III. Results analysis for SRI on-farm trials:

➤ Average yield per district:

In both districts, the average results clearly show a net improvement in SRI yield compared to the yield with the traditional. In total, the average increase in yield has been **+ 49.65%**.

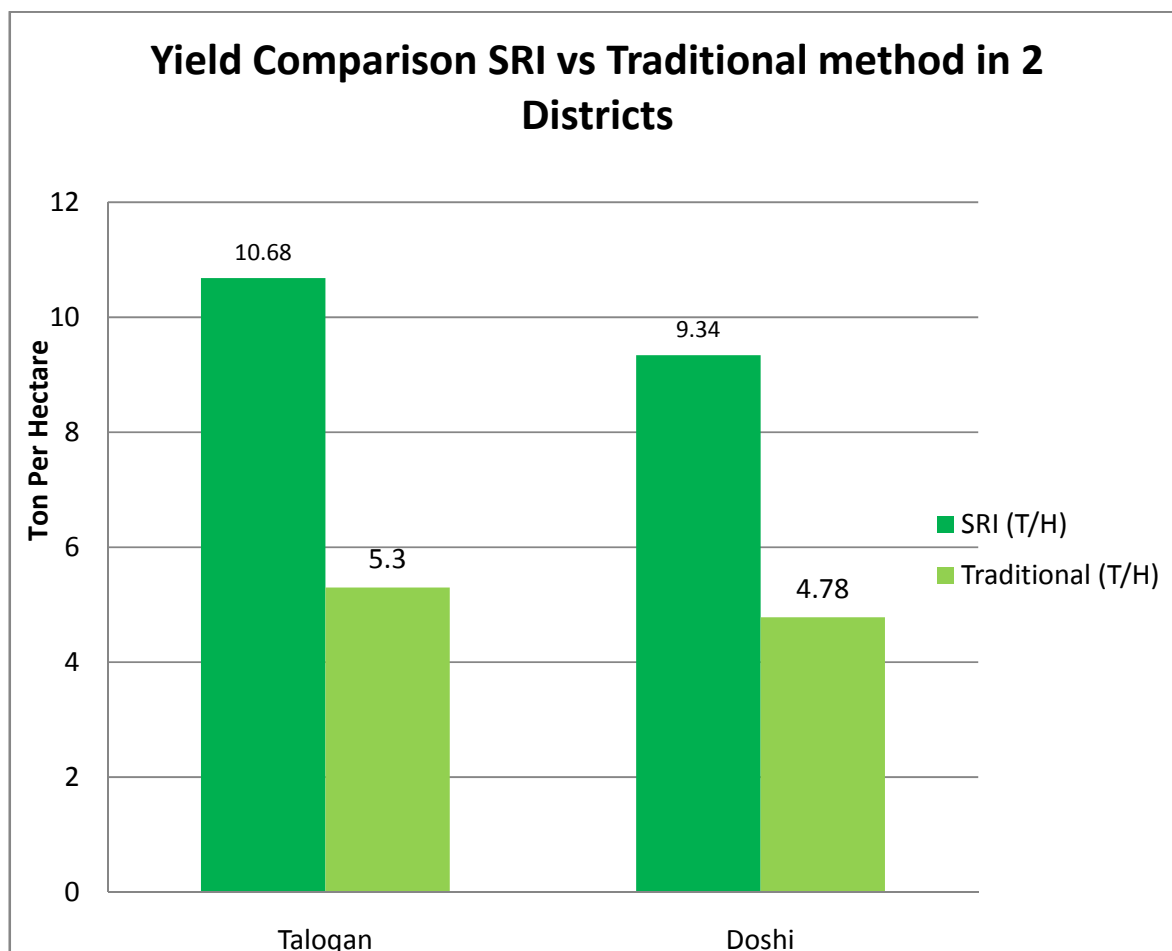


Figure 1: Yield comparison of SRI vs. traditional method in 2 districts. The results are based on a sample of 60 farmers for the 2011 irrigation season.

	SRI (T/ha)	Traditional method (T/ha)	% increase
Doshi	9.34	4.78	+48.82 %
Taloqan	10.68	5.3	+50.39%
Grand Total	10.01	5.04	+49.65 %

Table 1: Yield comparison SRI vs. traditional method in 2 districts. The results are based on a sample of 60 farmers for the 2011 irrigation season.

The results are overall very positive in 2011.

The 3 varieties used in Doshi were:

Doshi District:

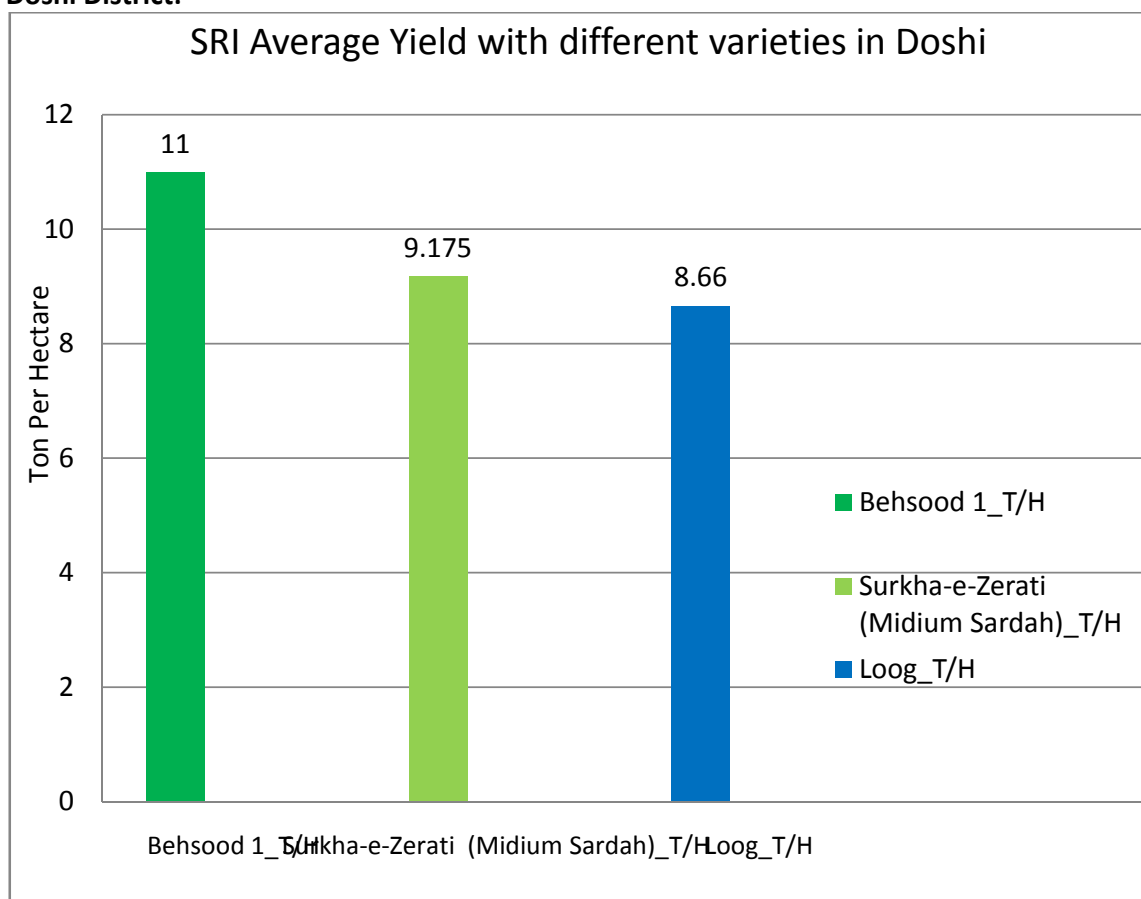


Figure 2: Yield of different varieties in Doshi District.

Variety name	Advantages / Disadvantages		Average SRI yield (T/ha)
Behsud 1	Shorter Cycle ; higher yield than Medium Sardah; resistant to dusty weather during the flowering stage - <i>Hawa Zadagi</i>	Less Market price than Medium Sardah	11 T/ha
Surkha-e- Zerati (Medium Sardah)	Better market price than Loog	Longer Cycle than Loog and Behsud 1; less yield than Behsud 1	9.175 T/ha
Loog	Early maturing; no need for parboiling; can grow in colder weather	Lower price; cannot be used for <i>Qabli Palaw</i> (a local dish)	8.66 T/ha

Table 2: Yield of different varieties in Doshi District.

The overall results do not show clear and systematic differences in terms of average SRI yield results between the main 2 varieties, Loog and Surkha Zerati (Medium Sardah). We had only single cases for the other varieties. This makes it difficult to take them into consideration in the analysis.

Note: Behsud 1 variety has been brought by PMIS from Behsud district of Nangarhar Province and one of the SRI farmers tested it. The result was very good, and next year other farmers also are also planning to use this new variety.

Higher SRI yields in comparison to traditional methods are usually associated with the 3 following factors:

- Higher number of tillers per m².
- Higher number of grain per panicle (each tiller has one panicle).
- Higher grain weight.

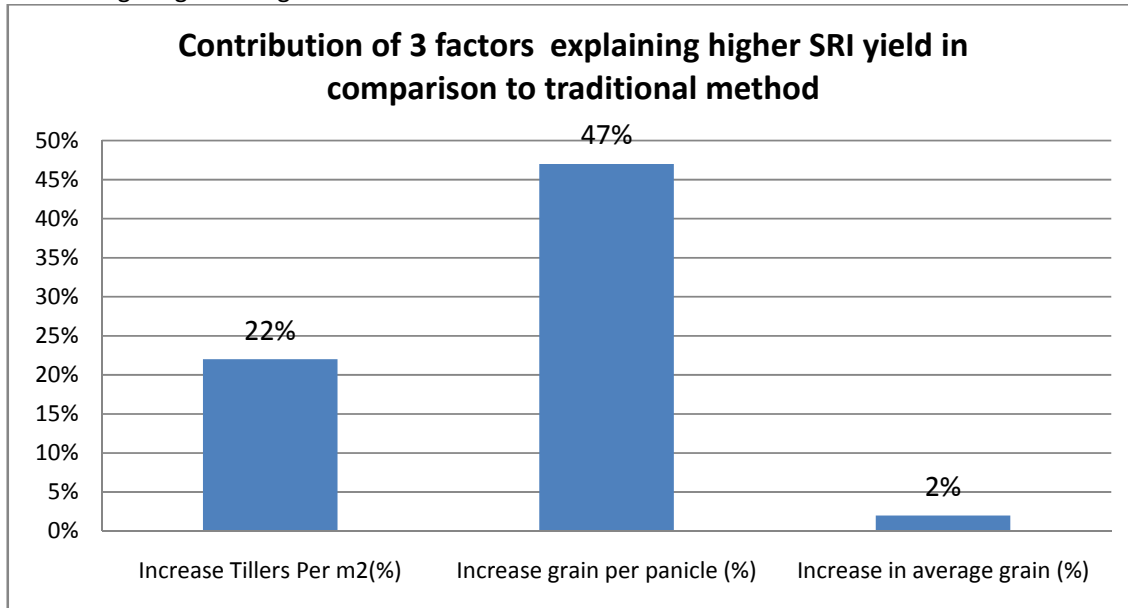


Figure 3: Contribution of the 3 main factors associated with increase in SRI yield compare to traditional methods.

The PMIS trials in 2011 show that:

- The key factor contributing to higher yield was the **47% increase in the number of grains per panicles.**
- The second most important contributing factor was **the 22% increase in tillers per m².**
- The average single grain showed a **2% increase in weight per grain.**

➤ **SRI yield and transplanting time:**

The SRI yield of the first crop (single) is better than transplanting SRI as second crop. In Doshi the results for the *Loog* variety cultivated as a second crop seem to indicate somewhat better results with early transplanting. The same applies with the *Surkha Zerati* (*Medium Sardah*) when cultivated as a first crop. Yet, the number of samples are relatively low (especially in Doshi) to confirm this finding.

Training SRI farmers to make compost and other organic inputs very cheaply

The SRI Team trained SRI volunteers through PTD groups to make compost and combine other organic inputs from their available sources as the chemical fertilizers are very expensive and farmers are too poor to be able to buy them. Compost made by the farmers along with green manure other organic inputs can improve soil fertility over the long term, while applying chemical fertilizers over a long period of time is not good for soil health.

SRI farmers were trained in making the following organic inputs.

- Fazil Bio Aab
- Bio Kasht
- Ferementere
- Compost



Photo 23: Making bio kasht, Chehl Kapa, Kelagai.



Photo 24: Making compost, Chehl Kapa, Kelagai.



Photo 25: Haji Khalil digging a pit for making compost, Kelagai.



Photo 26: Collecting dried weeds for making compost, Kelgai.



Photo 27: Collecting fresh weeds for making compost, Kelagai.

AKF-A, Senior staff are visiting SRI plots in Kelagai



Photo 28: Arvind Malik AKF Rural Development Manager of Baghlan Regional office and Yazdi from Baghlan Regional office visiting SRI plots of Haji Din Mohd, Kelagai.



Photo 29: Arvind Malik AKF Rural Development Manager of Baghlan region visiting SRI plots Haji Khalil, Kelagai



Photo 30: AKF Land and Water Unit Manager Yi Shaoliang and Sanjar Khan visiting SRI plots, Kelagai.

The following photos show SRI tillering and SRI long panicles.



Photo 31: Tillering SRI plants transplanted in straight lines



Photo 32: SRI plants have long panicles and more grains.



Photo 33: Comparison of rice plants grown with SRI (right) and traditional (left) methods

Recommendations for the 2012 SRI campaign:

- ✓ The **awareness raising campaign** needs to start earlier for the 2012 campaign. The transplantation/first-weeding period seems to be the most critical period during which new volunteers are still skeptical and prone to switch back to traditional method, so more emphasis should be put on this phase during the awareness-raising campaign. Experiences from 2011 volunteers who expressed regrets for not taking SRI seriously at first could be useful to convince new farmers in 2012.
- ✓ The successful SRI farmers in 2009, 2010 and 2011 should become supervisors. SRI should be promoted particularly in the upstream zones of PMIS canals as the head/tail issues are more acute in those canals than other areas.
- ✓ **Technical support:** The importance of **weeding** (on time!) needs to be strongly underscored. The results from 2011 are particularly telling and can be used for discussion with farmers in the future.
- ✓ **Incentives** should be provided to SRI farmers who are prone to try SRI on relatively large plots. Indeed, some farmers are still skeptical whether SRI can be applied on large amount of land due to high labor requirement. As an incentive, PMIS could cover part of the farmer's labor cost during transplanting if he accepts to cultivate more than 1 Jerib (0.2 hectare). This should be done only for the first time to help demonstrating other farmers that SRI can be cultivated on large plots.
- ✓ **Green manure and compost** can bring improvement to the already high SRI yield. A specific training module could be provided in parallel to SRI development so that interested farmers can apply green manuring instead of chemical fertilizers.
- ✓ **Resource Persons (RPs)** who have enough SRI experience should be promoted to SRI supervisors and take more responsibilities.
- ✓ Though the learning environment has been very good (despite security threats) while applying the methodology described earlier, it would be wise to conduct again a **PTD training program** tailored to the specific requirement of promoting the SRI method and capitalizing on the experience from this 2011 campaign.