



System of Rice Intensification (SRI) 2009 Campaign results & recommendations



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



System of Rice Intensification (SRI) 2009 Campaign results & recommendations

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I. General information:

➤ On-farm trials with SRI volunteers:

In 2009, 42 farmers including 7 resource persons (RP) and 35 new volunteers have been applying SRI method for rice cultivation in 3 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
	Baghlan	Doshi	Taloqan	
Resource persons	4	2	1	7
New volunteer	23	11	1	35
TOTAL	27	13	2	42

The 5 volunteers from 2008 have become resource persons and have led 5 Participatory Technology Development (PTD) groups, while 2 new volunteers have actually been selected as resource persons based on their motivation, even though they had not tried SRI in 2008. Each RP has been leading a group of new volunteers. Thus, a total of 7 PTD groups have been formed. The location of the 6 main groups comprising 40 farmers in Baghlan and Doshi is highlighted in Map 1.

The results are discussed in a further below section.

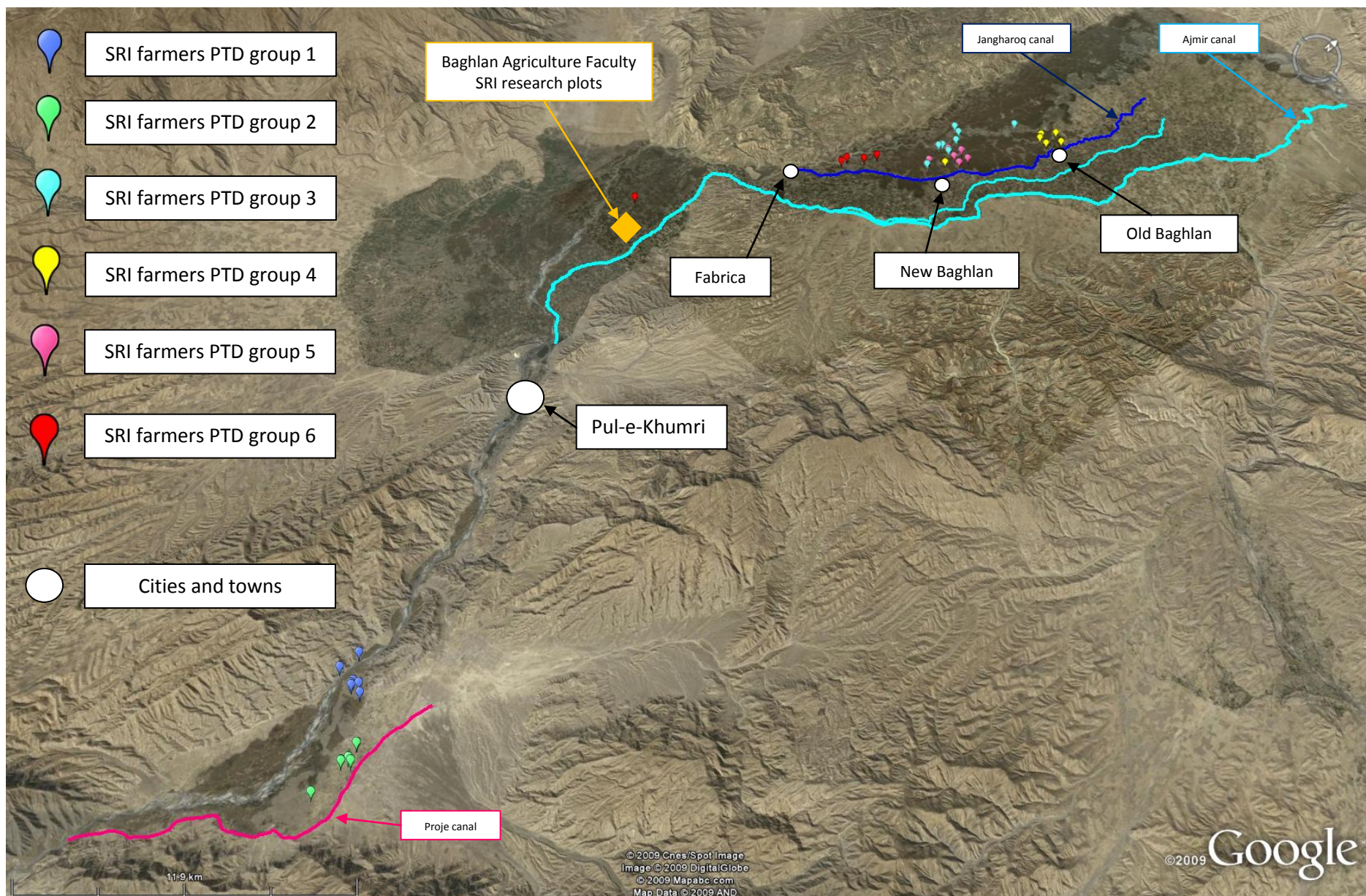
➤ SRI research plots :

In addition to the on-farm trials, the PMIS team conducted different experiments in the research farm of the Baghlan Agriculture Faculty (see location on Map 1). The plan of the different experimental plots is provided in figure 1.

The following experiments were conducted:

- Testing the application of different types of fertilizers (for the same transplantation date and same variety).
- Testing the impact of different transplantation dates (for the same fertilizer application and same variety).
- Testing the use of different varieties (for same transplantation date and same type of fertilizer application).

The results of these evaluations are reported and analyzed in a later section.



Map 1: Location of SRI farmers and their respective PTD groups in 2009 for Baghlan and Doshi.

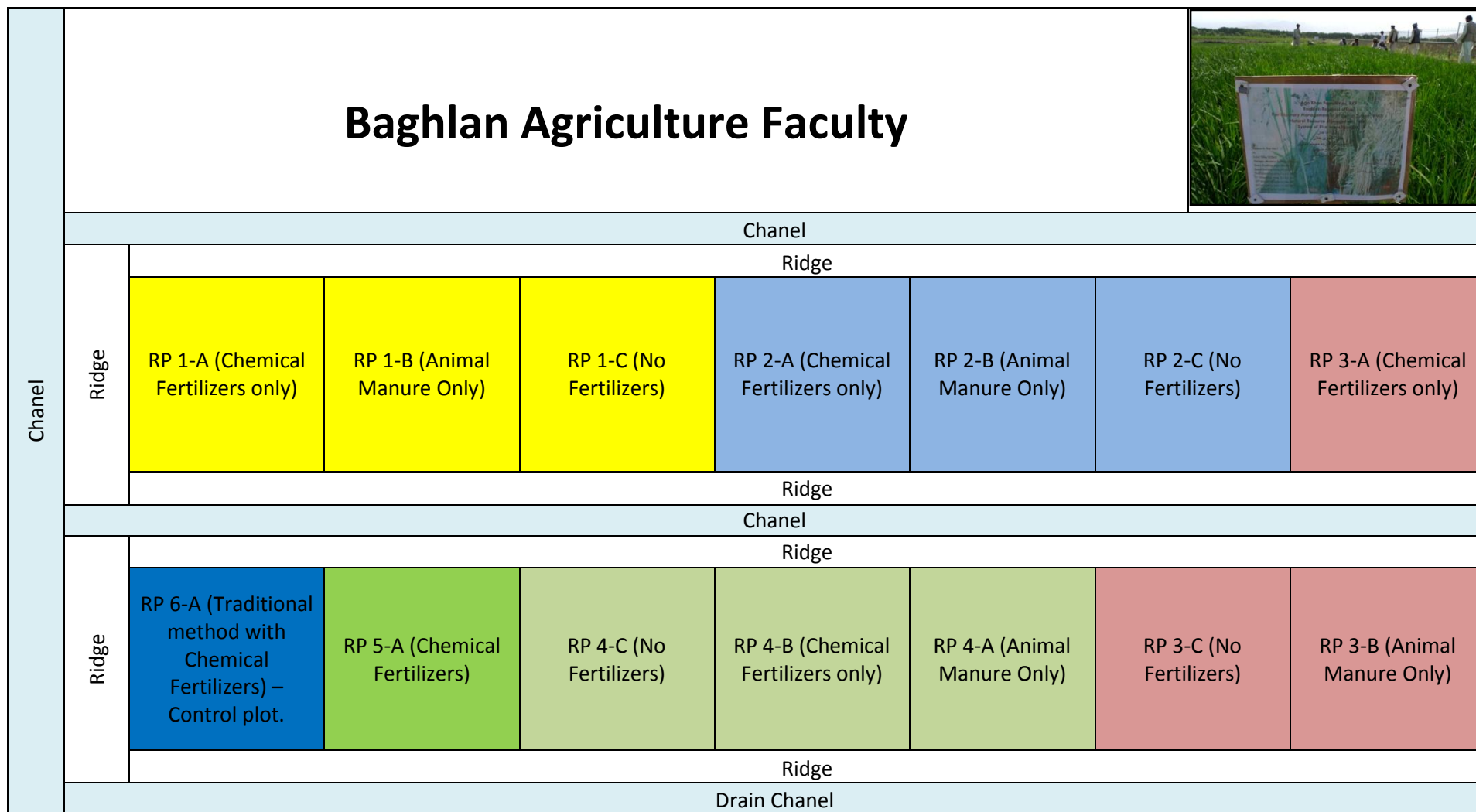


Figure 1: Plan of the different SRI research plots located at the Baghlan Agriculture Faculty.

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:

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 2008 and registration of volunteers was conducted.

2) Formation of PTD groups:

Groups of volunteers were formed so that each small group of volunteers can be related to one resource person (RP) who has experience with the SRI methods. This was undertaken to ensure that at any time a participating farmer can request assistance from a nearby resource person and can easily see in the field how SRI methods should be implemented.

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

At each important stage of SRI, field-level demonstrations have been organized for each PTD group, bringing the RP and his volunteers together at the RP plot. Technical discussions and practical demonstrations were carried out by the PMIS/SRI specialist with inputs from the RP to illustrate to the new volunteer the tasks they would have to carry out to reproduce SRI results in their own fields (see photos 3 to 7). Each session would be concluded by small group discussion to summarize the learning points (see photos 8 & 9).

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 the PMIS/SRI specialist, the volunteers were invited to comment and ask questions on possible remaining issues faced in their field.

5) Field days:

Field days were organized on 2 occasions for all volunteers from Baghlan, Doshi and Taloqan to see different fields and to share experiences. The research plots were also visited by farmers to assess the results of different SRI experiments (including different usage of fertilizers, different dates of transplanting, with different varieties) – see photos 10 to 17.

➤ **Local government staff capacity building:**

During the entire process detailed above, 3 extension officers from the Department of Agriculture, Irrigation and Livestock (DAIL) were trained and coached on the SRI technique and the management of a PTD group. Each of the staff members has been working for 60 days together with the PMIS/SRI specialist, to assist the RP and new volunteers. Such on-the-job capacity-building strategy should ensure that the DAIL has enough human resources to replicate a similar process with new SRI volunteers for the coming years.

A few positive points and limitations regarding the implementation of the mentioned methodology for the 2009 SRI campaign can be summarized, as below:

Positive experiences from 2009:

- In total, no less than 49 technical support meetings have been organized throughout the process with a high level of attendance.
- During the entire process, 3 DAIL staffs (one per district) have been trained practically. These 3 DAIL staffs members are now expected to supervise independently one or more PTD groups during the 2010 SRI campaign.
- It was acknowledged by the new volunteers that all the RP persons have played correctly their technical assistance roles when needed and requested. This ensured follow-up coaching and support between farmers' formal technical support meetings with the PMIS/SRI specialist.
- The field days have brought more than 70 participants each time from the 3 districts including DAIL and WMD officials who could be exposed to SRI. This included the Baghlan Provincial Water Management Director, the Provincial director from the Department of Agriculture Irrigation and Livestock.
- One of the field days has been covered by a journalist conducting a documentary on the Panj-Amu River Basin Program. In addition, BBC Persian radio journalists have been proposing to include SRI experience in their future broadcasting programs. The documents to be produced should support the visibility strategy for SRI within the PMIS project.

Limitations encountered in 2009:



Photo 1: Armed escort on the way to the SRI plots.

The security situation in Baghlan has been particularly dangerous and volatile since June onwards. There have been no less than 6 SRI volunteers who have received direct threats from Taliban (through night letters or verbally) with instruction to cease their activities with local government and NGOs. Those farmers have decided to stop SRI and switched to traditional cultivation method. On several occasions, farmers have organized armed escorts (see photo 1) to the SRI plots in order to ensure that field demonstrations could still be carried out. In some cases, however, volunteers could not be accessed directly by our PMIS/SRI specialist, but they could get assistance from their RP. In Taloqan, the number of SRI volunteers has been relatively low due to a late and too

limited awareness raising campaign.

Suggestions on methodology improvements for the next 2010 SRI campaign:

- 1) The awareness raising campaign has to start earlier for the 2010 campaign. Experience from German Agro Action (GAA) on the right bank of Taloqan can be useful to convince new volunteers to try SRI. The Taloqan team also needs to be reinforced so that proper technical assistance can be provided. The 2 successful SRI farmers from Taloqan in 2009 should become RPs. SRI should be particularly promoted in the upstream zones of Shurab and Chaman canals as the head/tail issues are more acute in those canals than other areas. It would also be wise to include Sharawan canal farmers (right bank of the river) who started SRI with GAA over the last 2 years.
- 2) In 2010, the 3 DAIL staffs who have now been trained for a year should be given responsibility to supervise one or more PTD groups. Logistical and material support could be provided by AKF-A.
- 3) 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 tailored to the specific requirement of promoting the SRI method, especially for new staffs to be recruited as the number of volunteers will expand.



Photo 3: Demonstration of seed soaking by PMIS/SRI specialist to new volunteers.



Photo 4: Demonstration of field marking with PMIS/SRI specialist to new volunteers.



Photo 2: Demonstration on transplanting with PMIS/SRI specialist to new volunteers.



Photo 5: Demonstration on transplanting with support of the RP to new volunteers.



Photo 6: Demonstration and practical on mechanical weeding by the new volunteers with support of PMIS/SRI specialist.



Photo 9: Discussion and recap of lessons learnt after a field demonstration session.



Photo 8: Discussion and recap of lessons learnt after a field demonstration session.



Photo 7: Demonstration of field marking by PMIS/SRI specialist to new volunteers.



Photo 11: Information board on SRI research plot.



Photo 10: Discussion on crop development in different research plots.



Photo 13: Group work after field day to summarize lessons learnt.



Photo 12: New volunteer sharing his experience with other SRI farmers during a field day.



Photo 14: Jawan Shamali and Juma Ghul (2 RPs) sharing their experience during a field day.



Photo 16: SRI farmers from different districts visiting a RP plot just before harvest to share their experience of the 2009 SRI campaign.



Photo 15: SRI farmers assessing the crop development at an SRI research plot.



Photo 17: SRI farmers at an SRI research plot.

➤ Procures for measurement of results:

Measurement of harvest has been done in the presence of (at least) the PMIS/SRI specialist, the DAIL staffs trained in SRI and the volunteer farmer. In addition other DAIL staffs and farmers were invited to witness the process and see the results.

Harvest has been collected from representative samples from both SRI plot and neighboring traditional-method plot for comparison. In order to ensure that the results are representative for the entire plot, 3 samples of 1 m^2 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 follow:

First sample: 1 m^2 was selected from the best part of the plot in terms of production.

Second sample: 1 m^2 was selected from the worst part of the plot in terms of production.

Third sample: 1 m^2 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 m^2 would be cut, which makes a total of 3 bunches (*Qaudah*). Note that with SRI practice, each m^2 as 16 hills as 16 seedlings were transplanted on $25 \times 25\text{ cm}$ spacing. Thus it is very easy to cut 1 m^2 of SRI. For the traditional-method plots, a 1 m^2 metallic frame was used. Tossing the frame into the field helps to select precisely the hills which fall within 1 m^2 (which can be between 17 and more than 30).

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

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 / m^2** 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 / m^2** (grain + straw).
3. Measure the **dry weight / m^2** (grain + straw). This is usually done 1 day later than the measurement of fresh weight.
4. Count the n° of **total tillers / m^2** (the total number of tillers for 3 bunches (*Qaudah*) will be counted and divided by 3 to get an average per m^2).
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 m^2 . The total will be divided by 9 to get an average per m^2 .
6. Measure the **total weight of grains / m^2** . The grains from 3 bunches (*Qaudah*) will be weighted together and the result divided by 3 to get an average.
7. Measure the **net weight** (after separating the empty seeds) of **grains / m^2** .

Photo 22: Counting the number of grain per tiller (right) and removing empty grains (middle) before measuring the net weight (left).



Photo 18: DAIL staff trained on SRI by PMIS is throwing the 1 m^2 frame in the traditional method rice plot.



Photo 19: Cutting a 1 m^2 selected sample.



Photo 20: Counting the number of tillers per m^2 from the cut sample. In this case, the PMIS/SRI specialist, DAIL staff, volunteer and his RP were participating.



Photo 21: Measuring the fresh weight (grain + straw).



III. Results analysis for SRI on-farm trials:

➤ Average yield per district:

In all 3 districts the average results clearly show the net improvement in SRI yield compare to traditional method yield. In total, the average increase in yield has been + 66%.

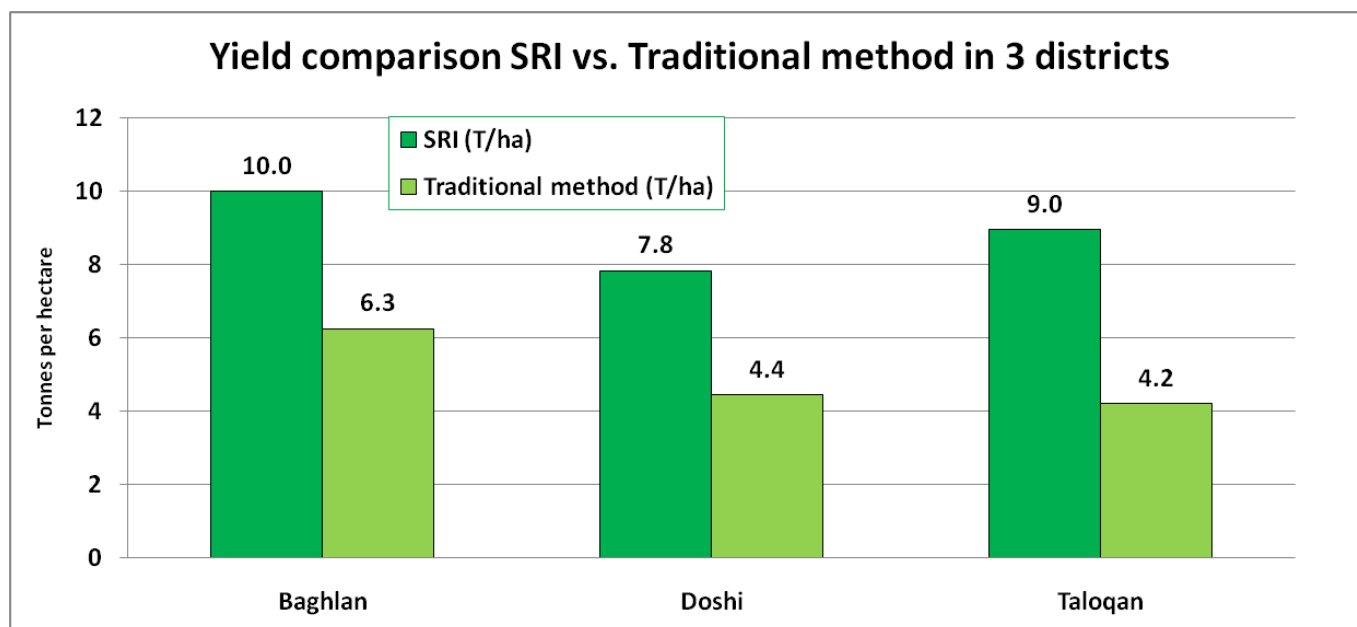


Figure 2: Yield comparison SRI vs. traditional method in 3 districts. The results are based on a sample of 42 farmers for the 2009 irrigation season.

The land in Baghlan is known to be more fertile than in Doshi, which explains a slightly lower SRI yield for Doshi farmers. The results in Taloqan are very encouraging but only few farmers have started SRI in this area. Results will have to be confirmed in the coming years.

Districts	SRI (T/ha)	Traditional method (T/ha)	% increase
Baghlan	10.0	6.3	+59 %
Doshi	7.8	4.4	+76 %
Taloqan	9.0	4.2	+113 %
Grand Total	9.3	5.6	+66 %

Table 1: Yield comparison SRI vs. traditional method in 3 districts. The results are based on a sample of 42 farmers for the 2009 irrigation season.

The results are overall very positive despite agro-climatic conditions for 2009 which were less favorable than in 2008. Indeed, due to relatively important rainfall during spring season, the wheat harvest has been delayed and occurred much later in comparison to a normal year (as in 2008 for example). As a result, a lot of rice fields had to be transplanted quite late which led to a large majority of cases where maturing level was low.

➤ Detailed results per district:

A detailed presentation of results per district is provided in the figures below.

Baghlan district:

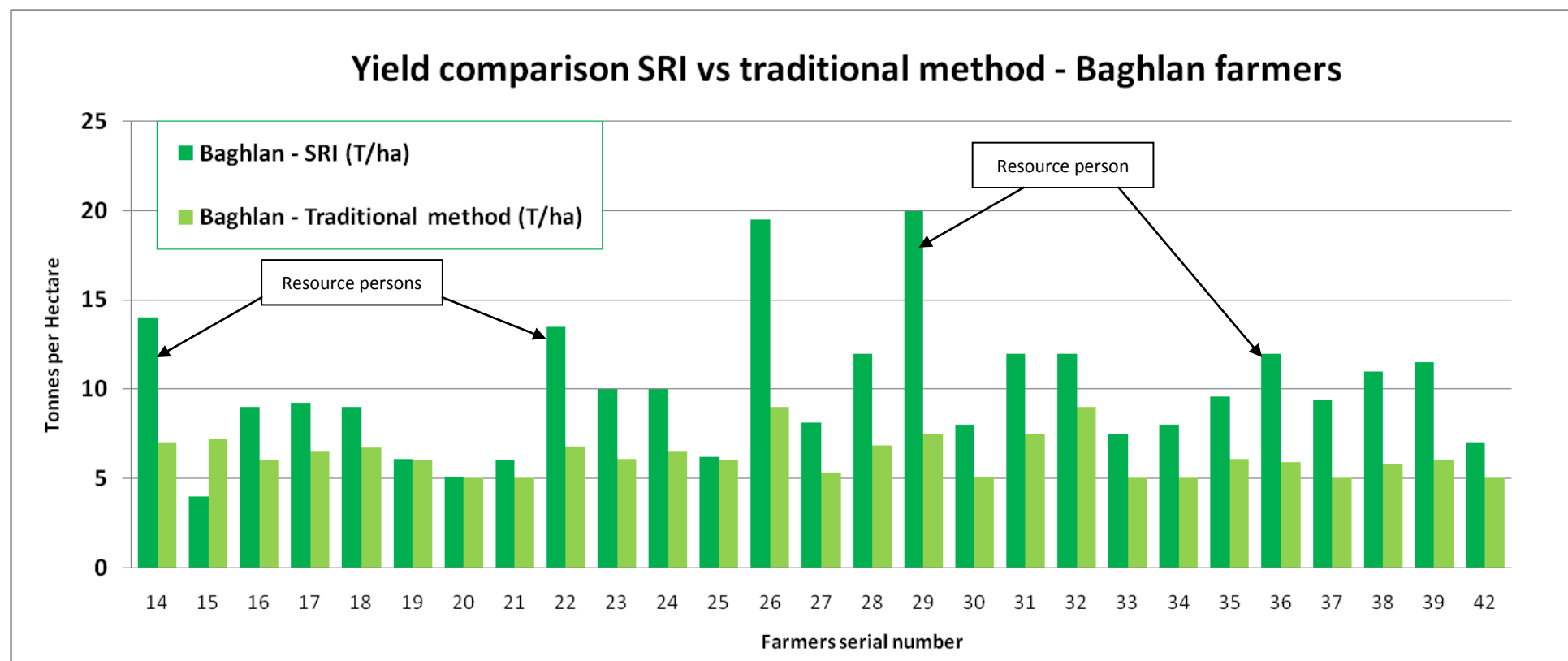


Figure 3: Detailed SRI yield vs. Traditional method comparison among the 27 Baghlan farmers for the 2009 irrigation season.

In Baghlan, only one SRI farmer (#15) out of 27 farmers got a lower yield with SRI than with the traditional methods. The key reason was that he did not follow SRI method as recommended (he transplanted too late, did only 2 weedings and not on time, etc...). All the other farmers managed to get in average +59 % yield increase.

Note that the resource persons (i.e. experienced farmers) have yields which are significantly superior to the overall average (see discussion in next paragraph).

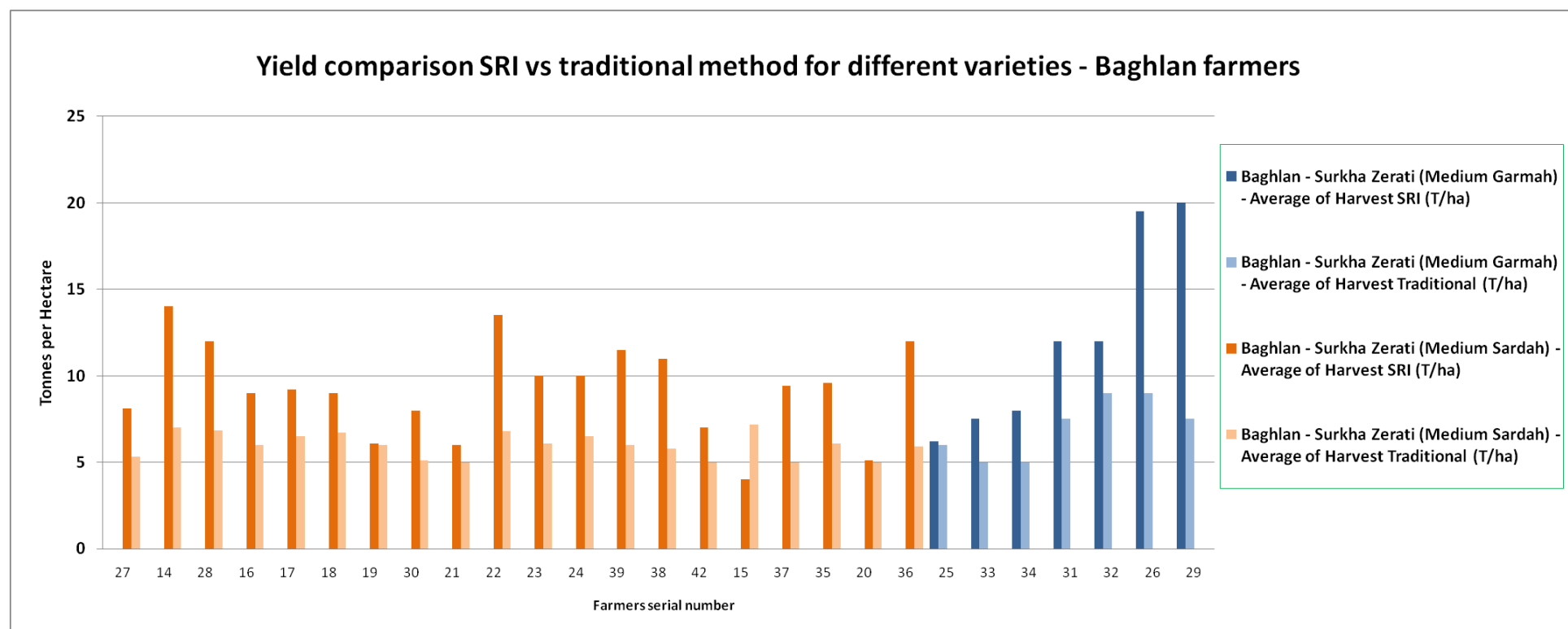


Figure 4: Detailed SRI yield vs. Traditional method comparison among the 27 Baghlan farmers for the 2009 irrigation season, organized by rice variety.

The 2 varieties used in Baghlan were:

Variety name	Advantages / Disadvantages		Average SRI yield (T/ha)
Surkha Zerati (Medium Garmah)	Good price but less than Long Garmah; Good yield; shorter cycle than medium Sardah	Lower market price than long Garmah	12.1 T/ha
Surkha Zerati (Medium Sardah)	Better market price than Medium Garmah	Longer cycle than Medium Garmah; Usually lower yield than Medium Garmah	9.2 T/ha

The overall results do not show clear and systematic differences in terms of average yield results for SRI between both varieties, even though the best results (19.5 and 20 T/ha) were obtained with Surkha Zerati (Medium Garmah).

Doshi district:

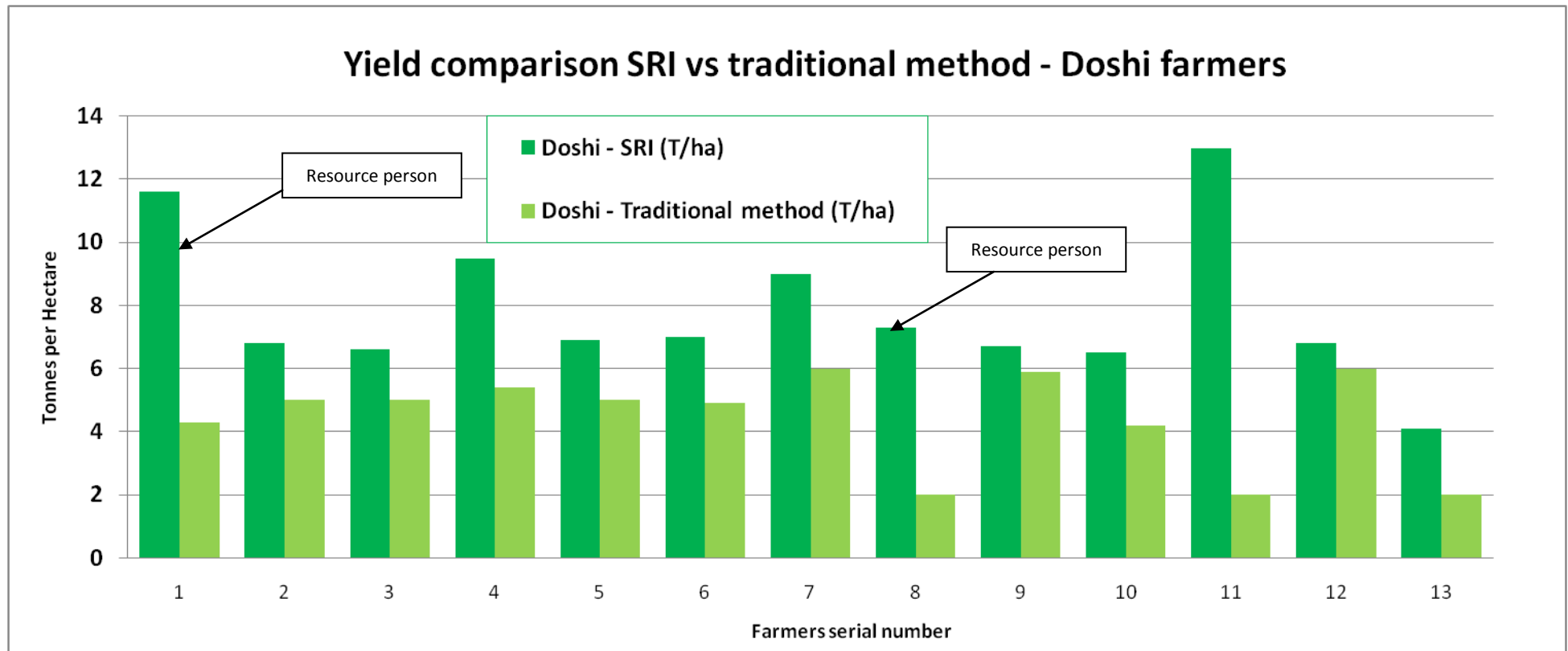


Figure 5: Detailed SRI yield vs. Traditional method comparison among the 13 Doshi farmers for the 2009 irrigation season.

In Doshi, the 13 farmers managed to get in average +76 % yield increase. One resource person (#1) got a very high yield (11.6 T/ha) while the other one (#8) got a yield of 'only' 7.3 T/ha. The latter case is specific as he had to enlarge his cultivable land this year, transferring some of his fertile soil in the process. As a result, for this year both his traditional and SRI method results were expectedly lower than what it should be.

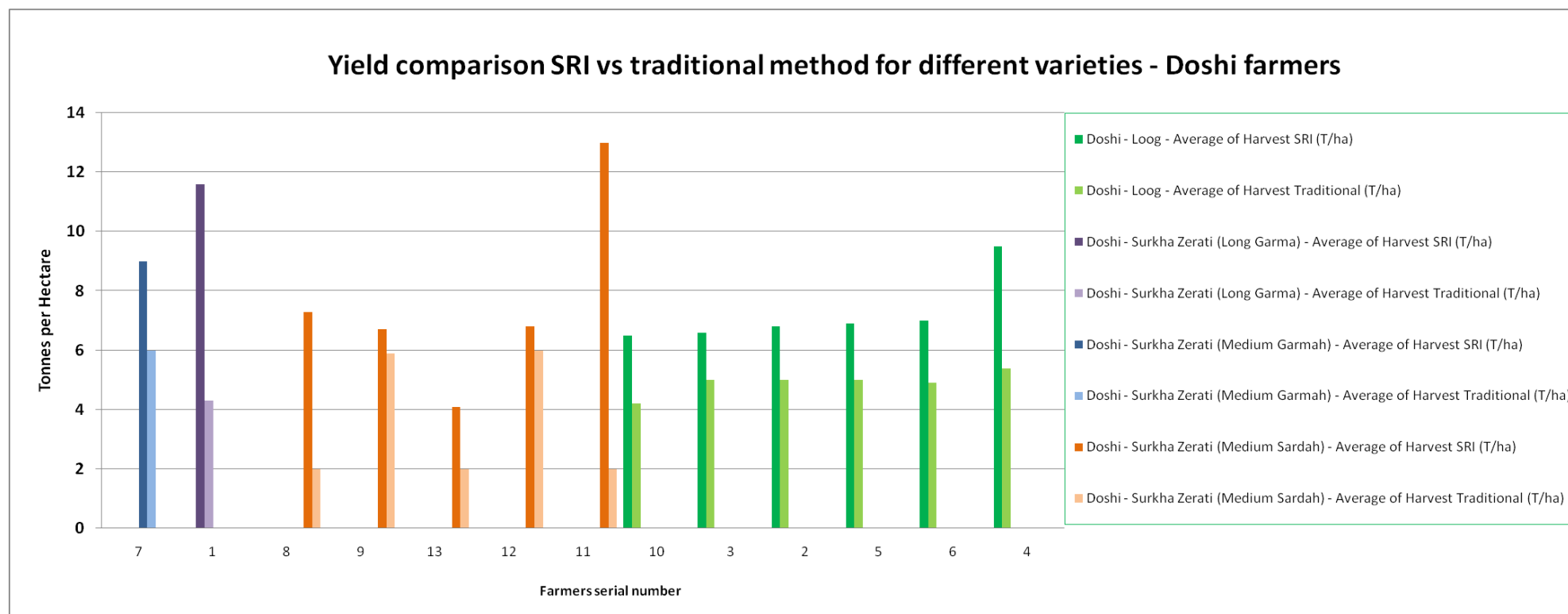


Figure 6: Detailed SRI yield vs. Traditional method comparison among the 13 Doshi farmers for the 2009 irrigation season, organized by rice variety.

The 4 varieties used in Doshi were:

Variety name	Advantages	Disadvantages	Average SRI yield (T/ha)
Loog	Early maturing; no need for parboiling; can grow in colder weather; higher yield	Lower price; cannot be used for <i>Qabli Palaw</i> (a local dish)	7.2 T/ha
Surkha Zerati (Long Garmah)	Higher market price	Less yield than Medium Sardah; Late maturing; less resistant to dusty weather during the flowering stage - <i>Hawa Zadagi</i>	11.6 T/ha
Surkha Zerati (Medium Garmah)	Good market price but less than Long Garmah; Good yield; shorter cycle than medium Sardah	Lower market price than long Garmah	9.0 T/ha
Surkha Zerati (Medium Sardah)	Good market price;	Longer Cycle than Medium Garmah; less yield than Medium Garmah	7.6 T/ha

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.

Taloqan district:

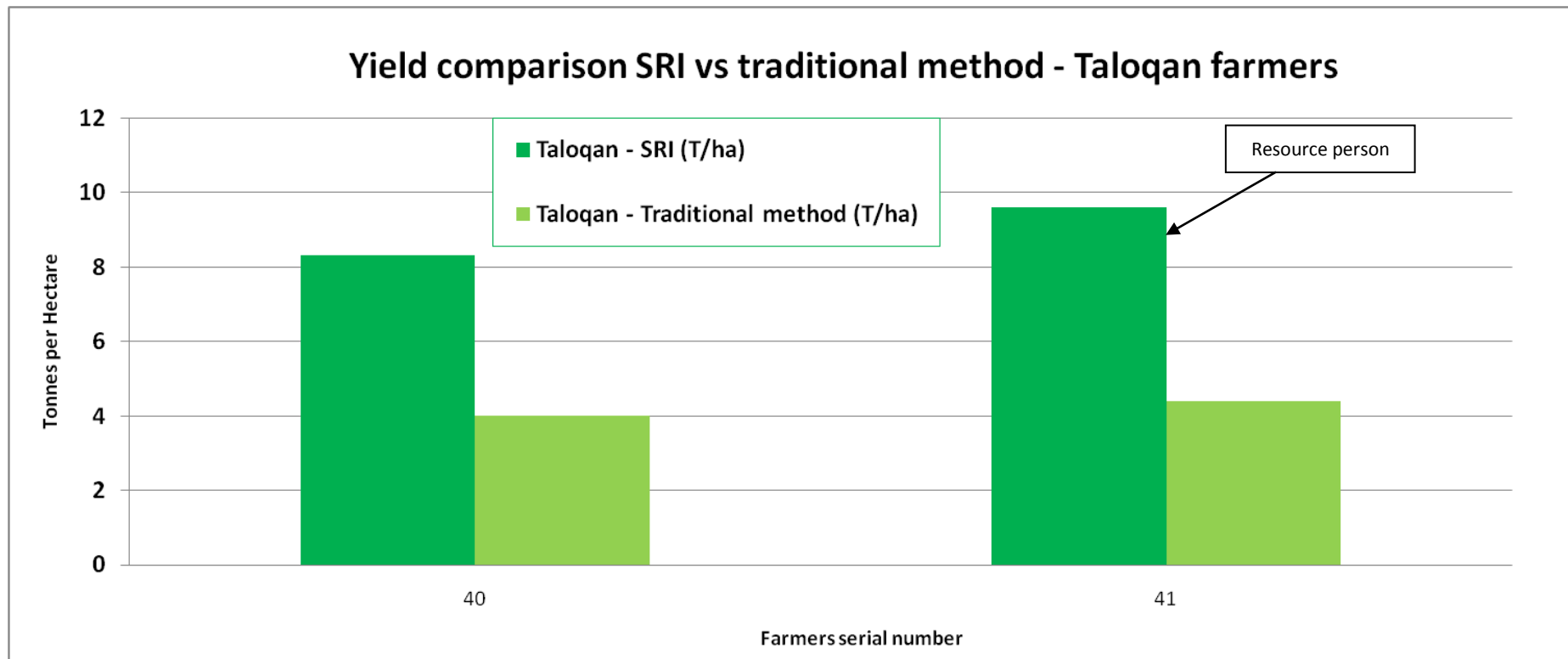


Figure 7: Detailed SRI yield vs. Traditional method comparison among the 2 Taloqan farmers for the 2009 irrigation season.

Unfortunately in Taloqan, only 2 farmers this year tested the SRI methods. Their results, however, were very promising. Potential for SRI development in Taloqan is very high and expansion should be a priority for 2010.

➤ SRI harvest per farmers category, experienced farmers vs. new volunteers:

It is clear that the experienced farmers had much better yields this year than the new volunteers, while the traditional method brought (understandably) similar results for both categories.

	Number	Average Harvest SRI (T/ha)	Average Harvest traditional method (T/ha)	Increase yield %
Experienced farmers	5	13.3	5.6	+ 140 %
New volunteers	37	8.7	5.5	+ 55 %

The reasons are as follow:

- First, the RPs were convinced during their first-year trial that SRI can bring excellent results if the method is meticulously applied (including during the critical stages of nursery preparation, transplanting and 1st weeding). In 2009, RPs showed great dedication to applying SRI methods. The table below shows how they have increased their SRI yield by an average of **+27 %** from 2008 to 2009.

SRI Harvest 2008 (T/ha)	SRI Harvest 2009 (T/ha)	Increase yield %
10.4	13.3	+ 27 %

- Inversely, the new volunteers have often adopted a « wait and see » attitude, and some of them haven't put full effort in taking care of their SRI demo plots, as they were somehow skeptical it would produce results. The same farmers have often discovered too late (after the 2nd or 3rd weeding in their plot or after visiting their RP's plot) that SRI could actually deliver very good results. It is however encouraging to note that the SRI yield of the volunteers (even including those who put less effort into meticulously following the different steps) was still 55 % more, on average, than with their traditional methods. During the measuring of yield results, a number of volunteers regretted not having put more efforts into SRI and have acknowledged that if they had been a little more careful with their plot, their yield would have been even better.

Suggestion:

Though it is good that new volunteers have taken their first-year experience as a lesson and acknowledged they should have put more trust in SRI from the onset, the PMIS/SRI team should put more effort in the awareness-raising campaign, making the skilled farmers to talk about their experience in order to convince new volunteers to take the process seriously, especially in the early stages when new farmers remain skeptical. The SRI manual would also be a good tool serving that purpose.



Photo 23: For the second year, Jawan Shamali (RP) is the most successful SRI farmer. From 14 T/ha in 2008, he managed to achieve 20 T/ha in 2009!



Photo 24: Jawan Shamali (RP) assessing the growth of his SRI plant in Baghlan where he got 20 T/ha in 2009.

➤ SRI land size :

On average the RPs have taken larger plots than the new volunteers, due to their successful trials last year. However, the SRI land size remains low in comparison the total size of rice plots.

	Average SRI land size (m2)	Max. SRI land size (m2)	Average rice land size (m2)	% of rice land under SRI
Experienced farmer	698.6	920	5,389	13.0
New volunteers	339.2	840	12,732	2.7

It is encouraging to see that RPs, i.e., farmers with one year of experience, are now applying SRI on 13% of their land. New volunteers are more cautious as they take only 2.7% of their land under SRI. Note that percentage coverage difference is partly balanced by the fact that RPs have in average slightly more than 2 times less land than the new volunteers.

Suggestion :

As it seems that there was still some reluctance or prudence to apply SRI on plots larger than 0.5 jeribs (0.1 hectare), more awareness has to be made and initiatives have to be proposed for at least few volunteers to try SRI on larger amount of land (at least between 2 and 5 jeribs). The main blockage might be the labor requirements for transplanting. As an incentive, support in terms of partial labor cost coverage could be provided to farmers who are ready to try SRI on plots larger than 5 jeribs (1 ha) for the first time.



Photo 25: Despite excellent results, SRI plots remain relatively small as farmers are experimenting. Field visit in Doshi.



Photo 26: Despite excellent results, SRI plots remain relatively small as farmers are still experimenting. Field days (here in the presence of BBC journalist documenting PMIS for a PARBP documentary) are one of the strategies to encourage innovative farmers to upscale their SRI method application.

➤ Factors associated with higher SRI yield:

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.

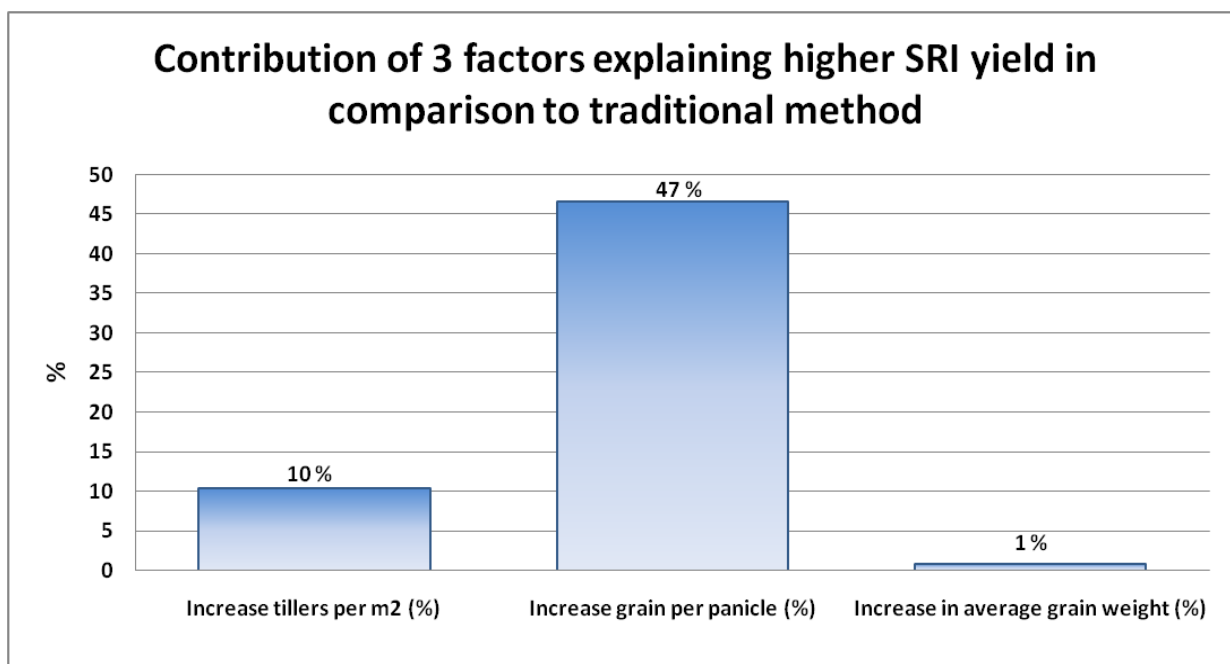


Figure 8: Contribution of the 3 main factors associated with increase in SRI yield compare to traditional methods.

The PMIS trials in 2009 show that:

- The key contributing factor to higher yield has been the **47% increase in the number of grains per panicles.**
- The second most important contributing factor has been **the 10% increase in tillers per m².**
- In the PMIS case for 2009, the average single grain weight has been almost the same with both methods. It was expected that the average single grain weight would be higher. Note however that experienced SRI farmers had an average grain weight +12% higher with SRI.



Photo 28: Jawan Shamali (an experienced SRI farmer) managed to get around 60 % more grains per panicle and 25% more tillers per m² with SRI in 2009.



Photo 27: SRI method (right) produced in average 47% more grains per panicle compare to traditional method (left).

➤ SRI yield and transplanting time:

It was expected that SRI yield would be better with early transplanting. The results in Baghlan for the two main varieties (*Surkha Zerati (Medium Garmah and Medium Sardah)*) cultivated as a second crop (after wheat) do not seem to confirm this expectation, however.

On the other hand, 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.

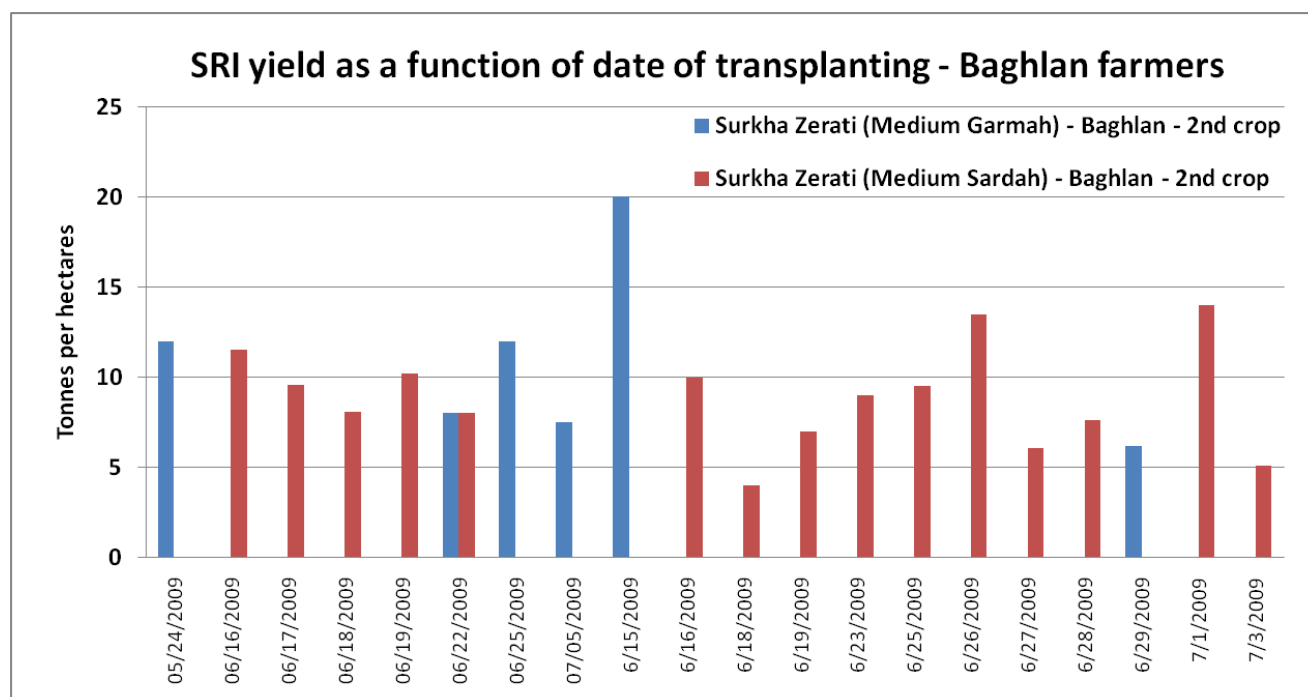


Figure 10: SRI yield for different transplanting dates among Baghlan farmers cultivating *Surkha Zerati (Medium Garmah)* & *Surkha Zerati (Medium Sardah)* as a 2nd crop.

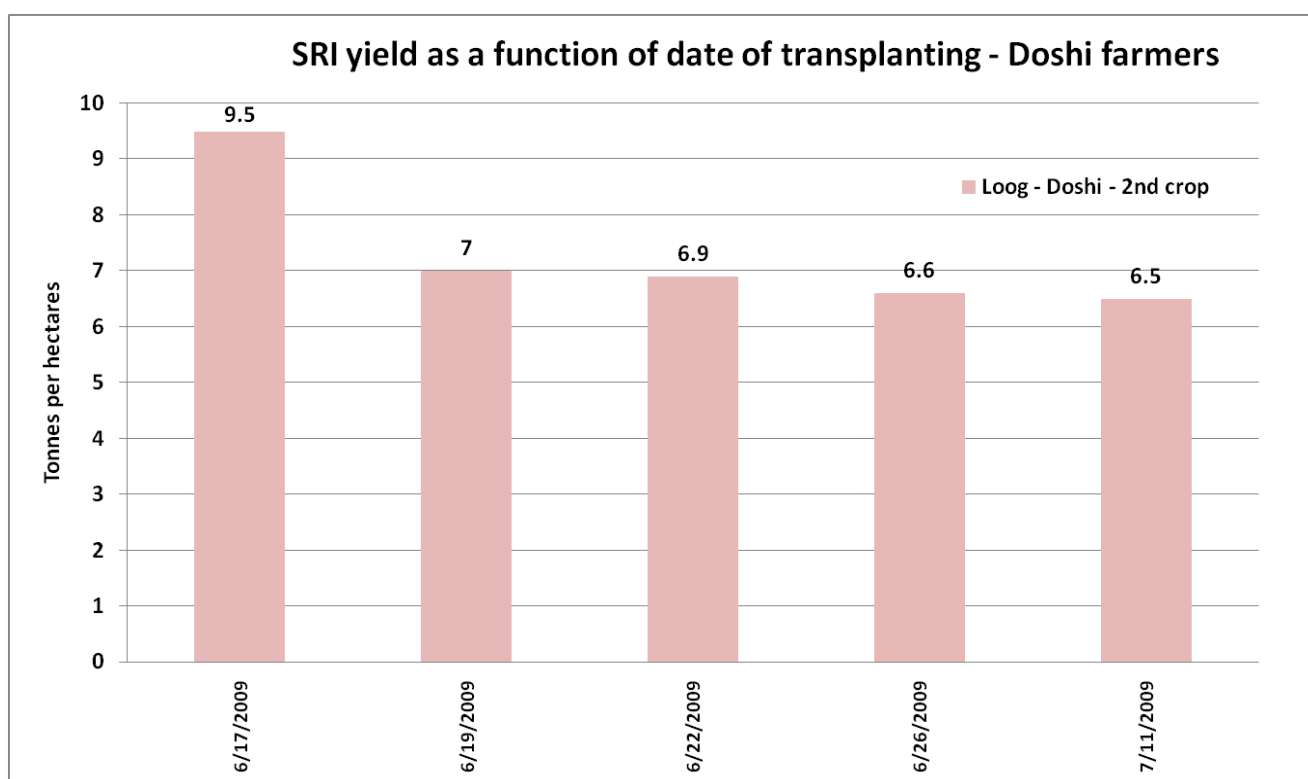


Figure 9: SRI yield for different transplanting dates among Doshi farmers cultivating *Loog* variety as a 2nd crop.

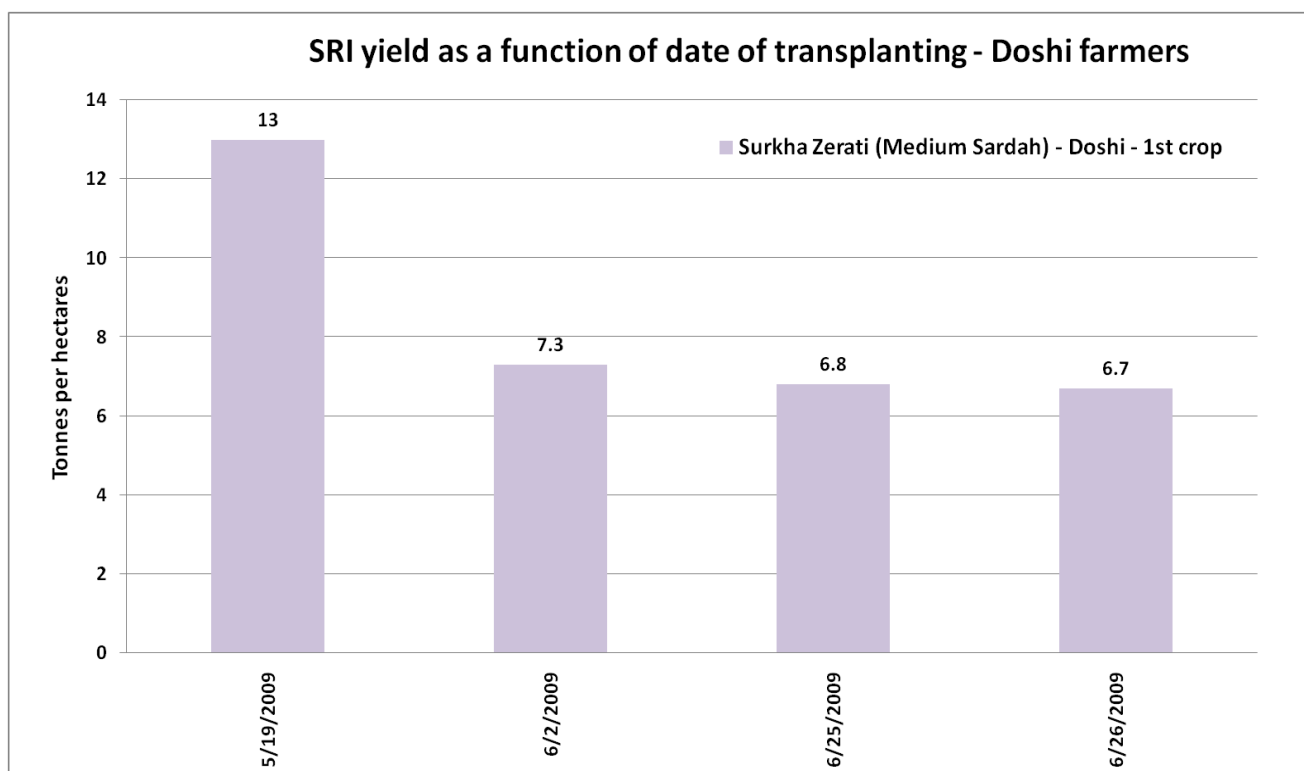


Figure 11: SRI yield for different transplanting dates among Doshi farmers cultivating Surkha Zerati (Medium Sardah) variety as a 1st crop.

➤ **SRI yield and the benefits of weeding :**

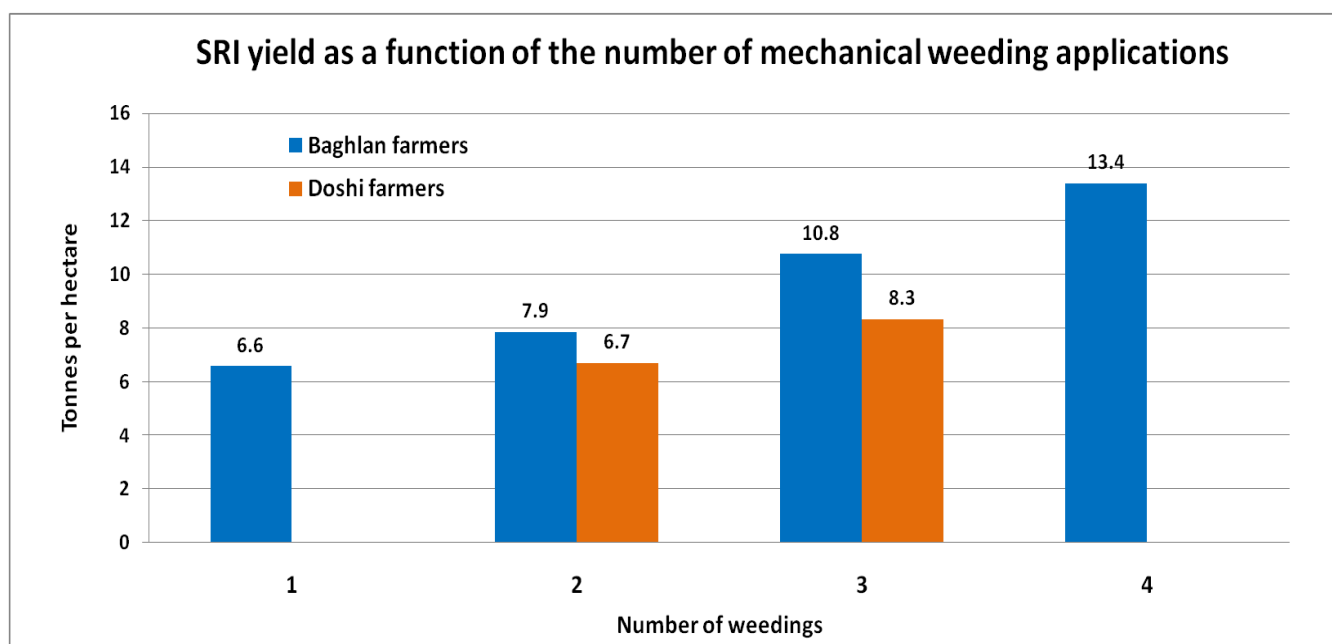


Figure 12: Impact of mechanical weeding applications on SRI yield among 42 farmers in Baghlan and Doshi.

The results from our samples of 42 farmers clearly indicate that the more weeding applications are applied the better is the yield. This is in line with other experiments in other parts of the world showing that each extra weeding, if done on time, can bring between 1-2 tonnes / ha extra yield, as reported previously in the SRI manual of WASSAN/CSA/WWF: *SRI – An emerging Alternative* – February 2006.

Suggestions:

From interviews with farmers during harvesting, it appears that in the early stages of SRI (at the transplanting stage), most volunteers are very skeptical about the potential of the young seedlings to development. Thus they tend to reduce their effort in applying SRI methods, and some do not do the first weeding on time if at all.

The positive point though is that all the volunteers have now witnessed the results of higher number of weeding applications mainly from their RP's plots. Thus those who didn't do the mechanical weeding properly have acknowledged that their lower yield was directly related to their lack of care in attending properly weeding operations.



Photo 29: Each weeding, if done on time, can bring an additional 1-2 T/ha yield.

Note that all the RPs did 4 weeding applications (except one who did 3), which shows that the lessons of last year have been learnt and applied.

Note also that few weeders have broken while in use. So, it will be necessary to check with local workshops to find ways for making them stronger.

IV. Results analysis for research SRI plot trials:

➤ Impact of different fertilizing methods at different transplanting dates:

- Results with Surkha Zerati (medium Sardah) variety:

The results show clearly that the **early transplanting** had a significant impact on the yield, whatever the fertilizer application was.

In the case of earlier transplanting (14th May), the chemical fertilizer application (5 Kg Urea and 2.5 Kg DAP) had significant impact on the yield with a **+32%** increase in comparison to the plot without fertilizer application. However, the application of animal manure did not seem to produce any significant impact in comparison to the plot without any fertilizer, only a **+3%** yield increase.

When transplanting later, on 26th May, even though the overall yield was lower than with earlier transplanting, the impact of fertilizer application was overall much higher than with early transplanting. Animal manure application was in this case higher (by + 120 %) than with application of chemical fertilizer (+92 %).

Late transplanting gave relatively low results overall although the impact of chemical fertilizer was still significant and much higher than with animal manure.

Regarding animal manure, it is important to note that this fertilizing method contributes more to fertility in the middle to long term. As this was the first experiment done on these plots, it is probably too early to draw any final conclusions about impact. Experiments will have to be iterated on these same plots so that a more comprehensive assessment can be arrived at.

Overall, the results also confirm the excellent results of SRI in the unfertile soil of the Baghlan Agriculture Faculty (considered unsuitable for rice). Indeed, the traditional-method control plot only produced 2 T/ha.

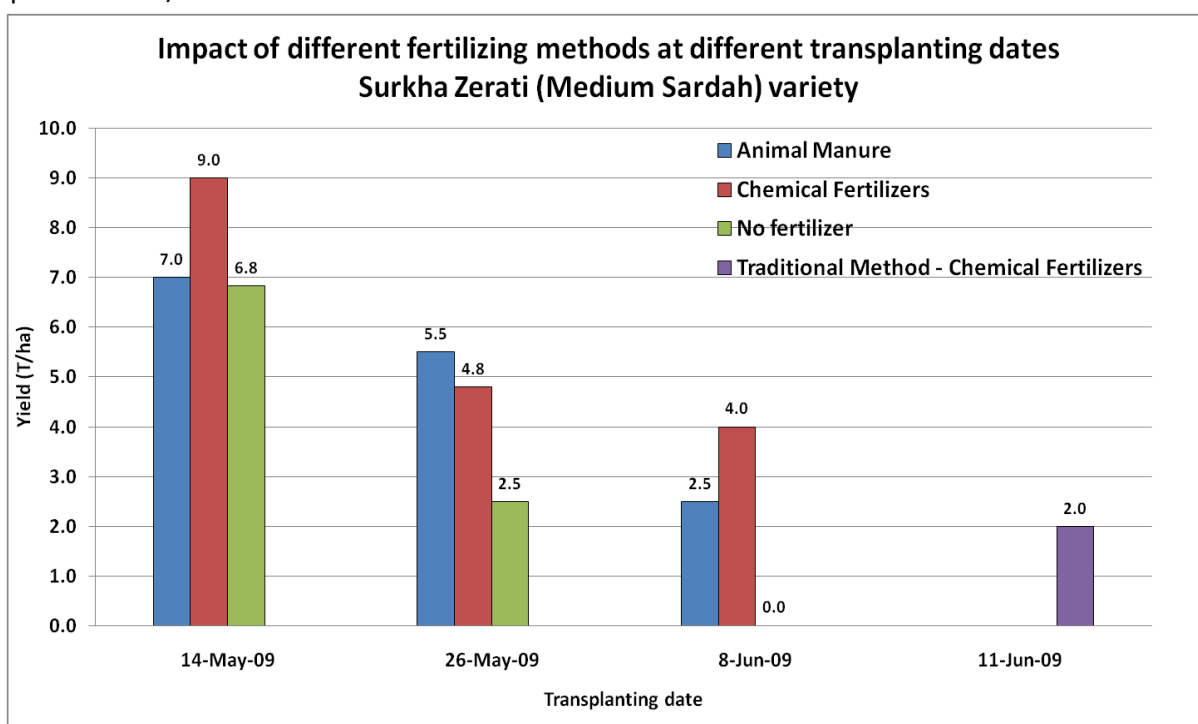


Figure 13: Impact of different fertilizing methods at different transplanting dates with the Surkha Zerati (Medium Sardah) variety.

- **Results with Loog variety:**

This variety showed similar impacts of chemical fertilizer and animal manure, with a yield increase of **+23-24 %** in comparison to the plot without any fertilizer.

Note that despite the fact that Loog variety was transplanted relatively late (4th June) it had similar if not better results compared to the Surkha Zerati (Medium Sardah) variety, which was transplanted much earlier (26th May).

It also had much better results than the traditional method which produced only 2 T/ha in the control plot.

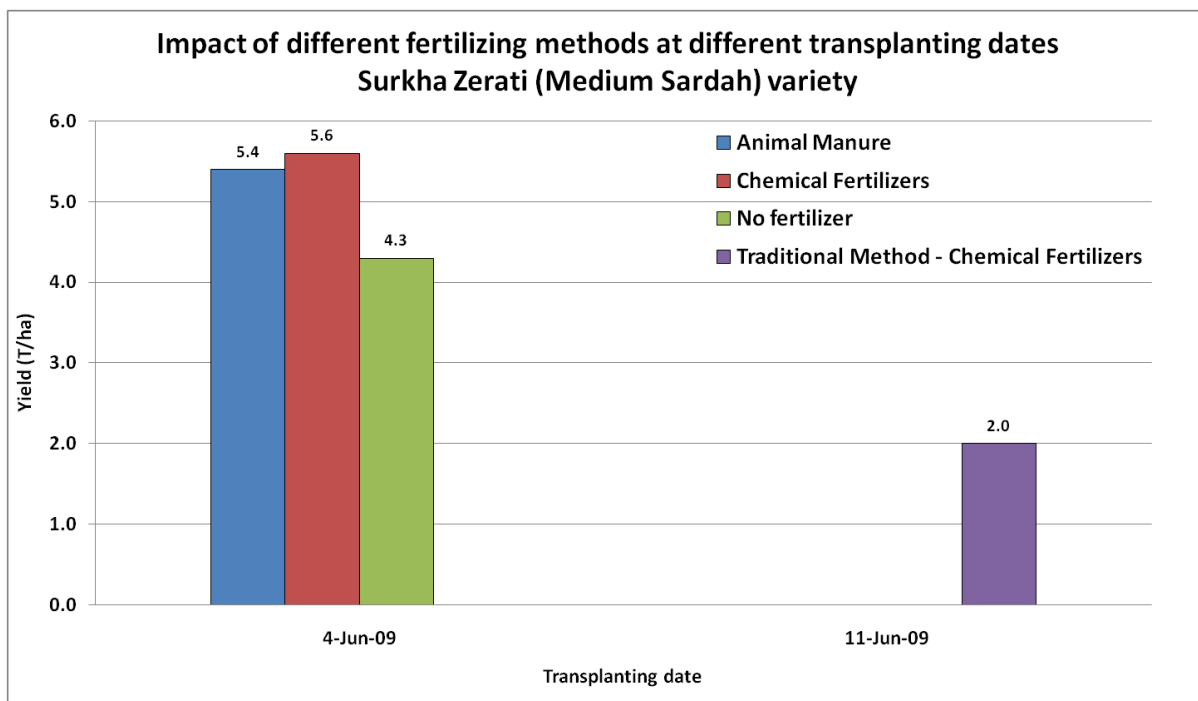
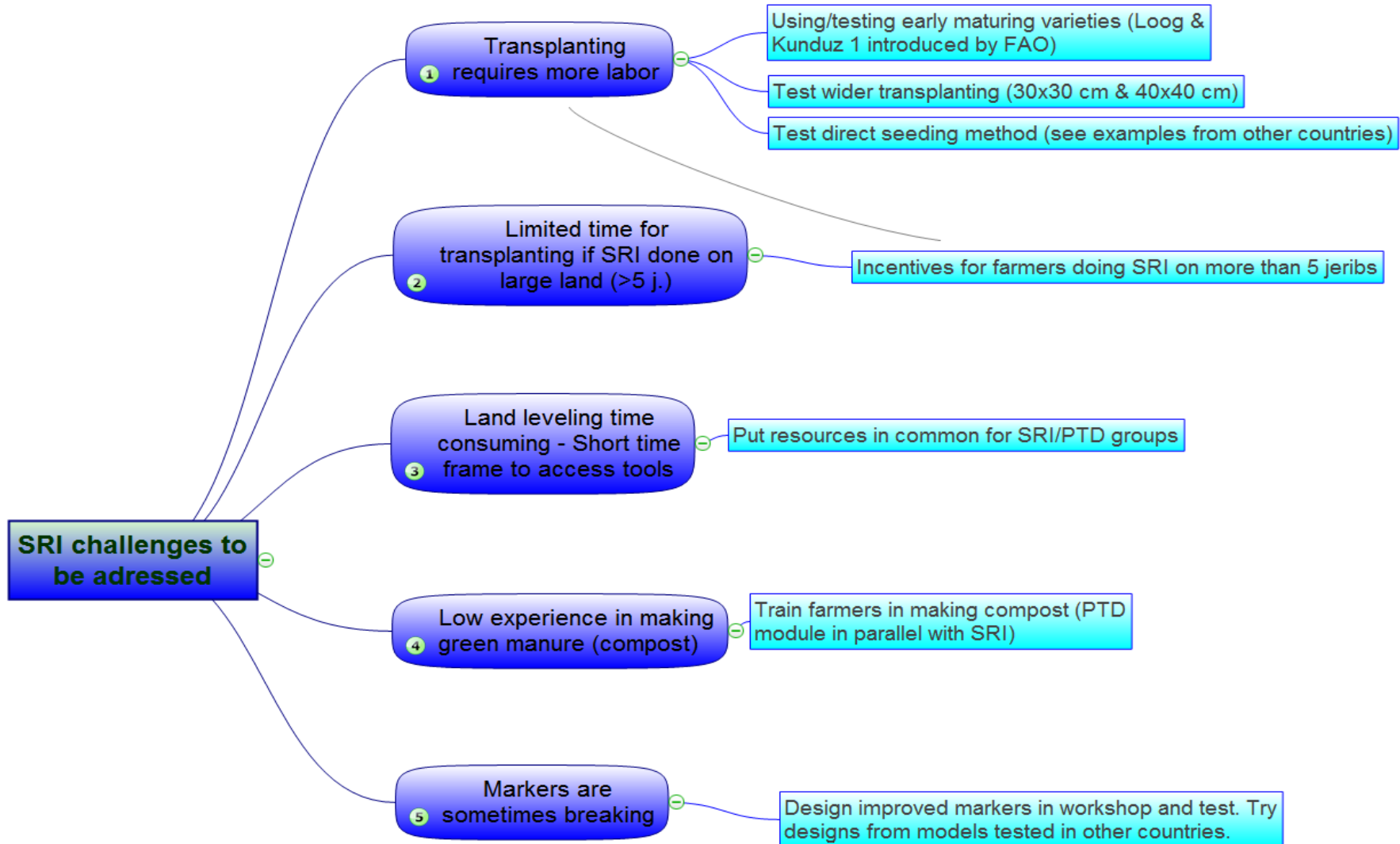


Figure 14: Impact of different fertilizing methods at different transplanting dates with the Surkha Zerati (Medium Sardah) variety.

V. Workshop results on SRI lessons learnt, challenges and recommendations



Challenges to be addressed and solutions proposed for SRI campaign 2010



VI. Conclusions and recommendations for the 2010 SRI campaign:

On-farm results:

- ✓ The average SRI yield for 42 farmers in 3 districts (Baghlan, Doshi and Taloqan) has been **9.3 T/ha** average.
- ✓ SRI has brought **+66 %** increase in yield compare to traditional method for 42 farmers in Taloqan, Baghlan and Doshi districts.
- ✓ Experienced farmers have increased their land size under SRI and have improved their SRI yield by **+ 27 %** in comparison to their first experiment last year.
- ✓ The increase in SRI yield compare to traditional-methods yield is mainly associated with the increase in the number of grains per panicle (**+ 47 %**) and the increase in number of tillers per m² (**+10 %**).
- ✓ The more weeding application (on time) the better the yield. Results range from 6.6 T/ha average with one weeding to **13.4 T/ha with 4 weedings**.
- ✓ In Baghlan, earlier transplanting did not necessarily translate into higher yield, on the contrary of Doshi results.



Photo 30: Haji Deen Mohamad is harvesting his SRI plot. He got 13 T/ha this year 2009.

Research plots results:

- ✓ The results show clearly that **early transplanting** is the most significant factor for getting higher yields.
- ✓ The supremacy of **animal manure vs. chemical fertilizer** could not be clearly demonstrated with those experiments. However, it is important to note that animal manure contributes more to fertility in the middle to long term. As it was the first experiment done on these plots, it is probably too early to draw any final conclusions. Experiments will have to be iterated on the same plots so that a more comprehensive assessment can be arrived at.
- ✓ More experiments should be conducted with the Loog variety as it seems that despite relatively late transplanting, it managed to get reasonable results. As Loog is an early-maturing variety, it could be an interesting alternative, especially for farmers doing double cropping and who harvest their wheat late. FAO has also introduced an new early-maturing variety named Kunduz-1 in Kunduz Province. This variety could be tested and compared with Loog.



Photo 31: Mohd. Azam, Khair Mohammad & Ali M. Ramzi have witnessed the impact of SRI method on tillers and root system development, at the Baghlan agriculture faculty research farm.

Recommendations:

- ✓ The **awareness raising campaign** has to start earlier for the 2010 campaign and should be given strong emphasis in Taloqan. As 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, more emphasis should be put on that phase during the awareness-raising campaign. Experiences from 2009 volunteers who expressed regrets for not taking SRI seriously at first could be useful to convince new farmers in 2010 to follow the entire process meticulously. Also, experience from GAA program on the right bank of Taloqan could be useful to convince new volunteers to try SRI. The Taloqan team also needs to be reinforced so that proper technical assistance can be provided. The 2 successful SRI farmers in 2009 should become RPs. SRI should be particularly promoted in the upstream zones of Shurab and Chaman canals as the head/tail issues are more acute in those canals than other areas. It would also be wise to include Sharawan canal farmers (right bank of the river) who started SRI with GAA over the last 2 years.



Photo 32: New volunteers find it sometimes hard to believe that such young seedlings transplanted with such wide spacing can bring excellent results few months later.

- ✓ **Technical support** and follow-up from PMIS/SRI specialist could also be more intense during the transplantation and first-weeding period as it is the key phase when new volunteers are still skeptical and prone to switch back to traditional method. The importance of **weeding** (on time!) needs to be strongly underlined. The results from the 42 farmers in 2009 are particularly telling and can be used for discussion with farmers.



Photo 33: New SRI volunteers sometimes underestimate at first the importance of weeding.

- ✓ **Weeders** need to be redesigned to be a bit stronger.
- ✓ Due to recurrent issues of higher **labor requirements** of SRI during transplanting, the research in Baghlan Agriculture faculty should now focus on labor-saving methods. First, direct seeding could be experimented. The method developed by Ariyaratne Subasinghe (Sri Lankan farmer) and explained in the SRI manual could be tried and adapted if necessary. Second, increase in spacing for transplantation could be tested as it was done in Iran. Tests could be done on 30x30 cm and 40x40 cm. In theory, a spacing of 30x30 cm (40x40 cm) would require 30% (60%) less labor than the conventional 25x25 cm.

- ✓ **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 ha (5 jeribs). This should be done only for the first time to help demonstrating other farmers that SRI can be cultivated on large plots. Economic analysis should show that the results worth the investment for the farmer.



Photo 34: Transplanting is seen as more labor intensive at first.

- ✓ **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.

- ✓ As SRI principles are starting to be well understood by farmers, the method could be tested on research plot for other crops. Wheat is

Photo 35: Successful SWI experiment in Madhya Pradesh (India).



SWI Status in Various places of MPRLP Shahdol (MLP)
Cluster – Ankuri, Village – Sanaa

widely cultivated so **SWI (System of Wheat Intensification)** might therefore raise the interest of numerous farmers in Takhar, Baghlan and Badakhshan provinces.

- ✓ In 2010, the **3 DAIL staffs** who have now been trained for a year should be given responsibility to supervise one or more PTD groups. Logistical and material support could be provided by AKF-A.
- ✓ 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 2009 campaign.



Photo 36: Ghulam Hazrat (DAIL staff – Doshi district) practicing marking.