Report on Short-term Technical Assistance to German Agro Action (GAA) for its Project on Social Management of Water in Afghanistan (SMWA), Taloqan Province, Afghanistan

Field Visit 1-19 May, 2008

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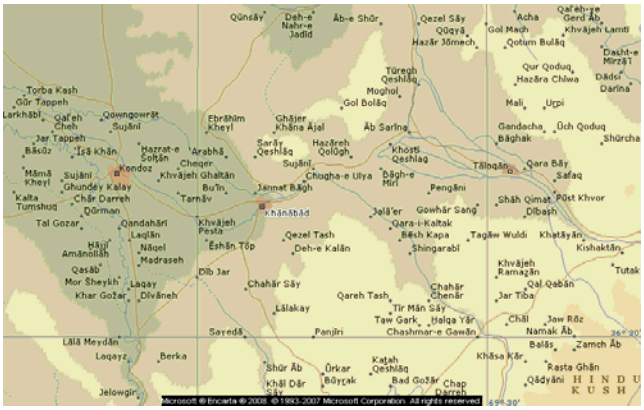
A Introduction

Located in the northeastern border Taloqan and Kundus are the two most important provinces of Afghanistan where agriculture and farming are more successful than in most of the other parts of the country. The green vegetation seen across most of the provinces, a rare sight in most of Afghanistan, is the result of available water. These provinces are also the important granary of Afghanistan as most of the wheat and rice are grown here.

The supply of water during the crop season, however, is not always regular, and there are high losses of water along irrigation delivery channels, partly due to poor management of the flow and partly due to a high infiltration rate of water because of the sandy nature of soils in most of the canals. The long-term war and conflict have inflicted enormous costs on the lives of the communities. The civil institutions in most of the country have been completely eroded. Recent climatic changes have also had an effect on the accumulation and melting of ice in the mountains which is the main source of water.



After the long war, the international community is now engaged in reconstruction work in most of the country with a variety of programs, ranging from pure construction work to health, education, and agriculture. Part of this is the Kundus River Basin Program (KRBP), operating in these two provinces. Financed by European Union, this program has attempted to improve the management and performance of water systems in the region and is encouraging participation of NGOs. German Agro Action (GAA) has been a key partner in this collaboration and has been implementing the Social Management of Water in Afghanistan (SMWA) project. The purpose is to mobilize communities and form water user groups and associations for better management of water systems, leading to better food security of the communities.

The System of Rice Intensification (SRI), known for its success elsewhere in raising the productivity of rice significantly with reduced amounts of water and less of purchased inputs, has been introduced to the communities by the project to improve both their food security status and the efficiency of water use. The purpose of this visit, which took place in May 1-19, 2008, was to enhance the capacity of the project team to strengthen the introduction and adaptation process of SRI among the communities with appropriate evaluation.

B Schedules or activities covered during the visit

Date	Activities
01-02, May 2008	Travel from Dhaka to Kabul by air via Delhi
03 May, 2008	Travel from Kabul to Taloqan by road
04 May, 2008	Discussions on the schedule with the agriculture team, and briefing on the project and its on-going activities in GAA office at Taloqan

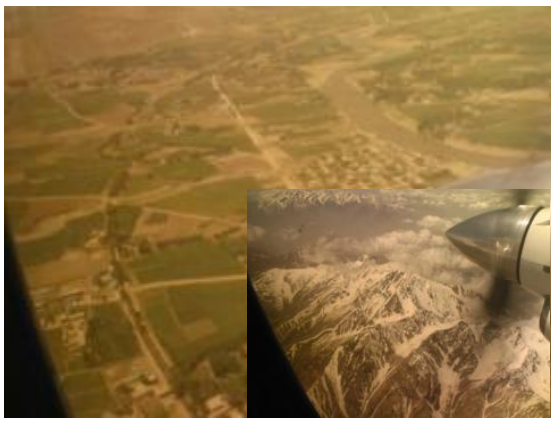
05 May, 2008	Presentation on the basic principles and practices of SRI in the morning, and open discussions in the afternoon with the agriculture team in office.
06 May, 2008	Meeting with farmers at the Department of Water Management and also in KRBP office in Kundus, sharing experience of other countries on SRI
07 May, 2008	Meeting and sharing experience on SRI with another group of farmers in GAA office in the morning, and continuation of discussion meeting with staff in the afternoon
08 May, 2008	Preparation of training curriculum on SRI for farmers, which includes identification of major topics, training methodologies, and necessary preparations.
9-10 May, 2008	Preparation of handout on SRI for farmers and for agriculture team
11 May, 2008	Sharing and discussion on SRI with the project's community mobilizers in the morning, and continuation of training curriculum preparation in the afternoon.
12 May, 2008	Field visit and demonstration of SRI transplantation in Konchi canal Charmgary village in the morning, and discussion in the afternoon with the project team
13 May, 2008	Field visit and demonstration of SRI transplantation in Qutum canal Bashir Abad village in the morning, and continuation of discussions/training with staff in the office
14 May, 20084	Field visit and demonstration of SRI transplantation in Qarapurchaw village, Kunchi canal, in the morning, and continuation of discussions/training with staff in the office
15 May, 2008	Presentation and discussion on Farmer Field School (FFS) with project team in office
16 May, 2008	Discussion on planning and development of work plan for the upcoming season
17 May, 2008	Travelling back from Taloqan to Kabul by air
18-19 May, 2008	Travelling back to Dhaka by air via Delhi

C Major observations

Climate, topography, and agriculture system in the region

The climate in the region is very contrasting, ranging from temperate to semi-arid or arid. During the winter, the temperature goes down below the freezing point, covering the entire landscape with thick ice; in summer it rises to as high as over 50 degree centigrade. The topography is quite diverse with rainfed and irrigated valleys surrounded by high mountains. The agriculture system has been characterized in terms of wheat and potato being major crops in the winter and rice in the summer from May/June to September/October. Wheat is grown in both the rainfed and irrigated systems and is planted two times a year but not on the same field. The first planting is done in October before the snowfall, and the second in February after the snowfall. Average wheat yields range from little over than 1 ton/ha in rainfed system to 3 tons/ha in the irrigated system.

Rice is grown only in irrigated systems. Two types of predominantly rice-based cropping patterns have been developed in the region. The first pattern is the single rice crop grown from middle of May to September followed by long fallow for the rest of the year. The second one is a rotation of wheat and rice, in which rice is cultivated from middle of June, immediately after the harvest of wheat. Average rice yields range from 3 to 4 tons/ha. Rice cultivation over the years has expanded considerably, leading to competition for water.



The region's irrigation system has been characterized by a large number of small and large canals crisscrossing across the flat valleys carrying water melted from ice in the upper mountains. The irrigation system has traditionally been managed locally by the communities, with the existing cropping systems and social structures having influence on the overall use of water. Any meaningful improvement in the overall performance of the system requires significant participation of the community. Therefore, social management of water is more important than just for basic improvement in the physical structures of the canals. This has rationalized GAA to undertake this Social Management of Water in Afghanistan (SMWA) project.

Introduction and evaluation of SRI in last year (2007)

SRI was introduced by the project in 2007 as part of its food security strategy with particular attention to efficient use and management of water by the farmers. Seven farmers participated in this initial trial, with each cultivating around 500 square meters. According to the project report, only one of them was successful. The yield of this successful farmer was 490 kg from 500 sq.m. area ,or 9.8 tons per hectare, which was surely a good achievement for a beginner with SRI. The project team, however, was not satisfied with this single farmer's success, and thus it has considered more activities for the upcoming season.

Along with GAA, the Aga Khan Foundation (AKF), another NGO working in Afghanistan, has also conducted trials with SRI, with technical assistance from an Indian expert. At field levels, there has been some technical sharing between Aga Khan Foundation and GAA. According to the agriculture team of GAA, and my personal communication with a senior staff from AKF, it is also not satisfied with the initial result of SRI. Its staff are planning to conduct more trials this year by themselves on rented lands to gain more confidence over the method, while continuing activities with farmers.

Lessons learned

Although the initial result was not highly successful, a number of lessons have been learned. Further analysis of these lessons and their use in the upcoming seasons would be an important basis to strengthen future activities on SRI.

Among the lessons learned, there has not been enough information regarding what made farmers not successful with SRI, indicating that there was not enough follow-up and

monitoring of the trials. From my observations in the field during the visit, and from further discussions with the agriculture team of the project, it appears that the seedlings used by farmers were of not good quality. They were old and tall, and there had not been enough weeding done during the season, which is not a very common practice here too. As a result, the field was highly infested with weeds, causing SRI fields to suffer more than farmers' traditional fields. Also, the crop cycle was started about one month late, so that while there was good vegetative growth, the grain production was not as expected.

Another important aspect was that most of the training offered to the farmers was purely theoretical. So it was difficult for them to visualize the whole picture of SRI. For example, how to uproot young seedlings from traditionally prepared wet seedbeds, where seeds were sown densely, was something very new to them. That is why most farmers preferred planting taller seedlings which are easy to pull. Use of a rotary weeder was also new to them, and there have not been enough weeders for the farmers. They have never seen how these weeders are operated in the field. Thus, most farmers did not do weeding at all.

What caused the SRI field to suffer most was that when taller seedlings were planted singly, they took longer period of time to get established in the main field, by this time the growth of weed was faster as the field was maintained only moist, which is very different from the traditional flooded method which is effective to control weeds in this way. Once the weed population grew, most farmers found it difficult to control the weeds by hand, leaving most of their fields unweeded, thus contributing to low yield.

It is worthwhile to note that SRI was introduced by the project staff based on their experience from reading materials, mainly from internet. In such a case, the success of one farmer with SRI was surely a great source of inspiration for them and the project as well.

D Discussions and sharing

Sharing on basic principles of SRI

SRI raises productivity not by relying on external inputs, e.g., new seeds and fertilizer, but by changing the way that farmers manage their rice plants, soil, water and nutrients. SRI's alternative practices elicit more productive phenotypes from available rice genotypes, whether local landraces or improved varieties. While chemical fertilizers do enhance rice yields when used with other SRI practices, adding to the soil decomposed biomass and/or manure to the extent available can give even better results. Agrochemical sprays are seldom needed or are not cost-effective because SRI rice plants are usually resistant to damage by pests and diseases.

SRI, therefore, is considered not as a 'package of technology' to be transferred or promoted to the farmers as happened with the Green Revolution. It is rather a set of guiding concepts and principles to provide the rice plant with an optimum environment to grow fuller and larger. To determine what is optimum for a rice plant under various conditions requires an understanding of these guiding principles. This helps farmers to customize the practices used in rice cultivation to their specific field conditions.

The success of SRI depends on how these principles are understood by the farmers, and how they have adapted the practices. Oftentimes, failing to realize this concept results in inappropriate practices, which is one of the main reasons why many farmers are not successful in SRI on first try. This has been discussed with the project staff and farmers at various spots in a number of gatherings. They have been also given some handout prepared during the visit on the guiding principles of SRI.

Discussion on the progress in other countries

Although SRI was first started in Madagascar, today farmers in 28 countries have started using SRI methods in various degrees. Among them, India and China are on the front line in terms of area coverage in the past years. This season, the Indian state of Tamil Nadu has 430,000 hectares of SRI cultivation, and in the coming season the area is expected to increase to 750,000 hectares. In Tripura, bordering Bangladesh, more than 70, 000 farmers practiced SRI in 2007. Farmers in two provinces of China, Sichuan and Zhejiang alone cultivated rice with SRI over 200,000 hectares in the past year. Indonesia conducted 12,133 on-farm comparison trials on 9,429 hectares with SRI in last year.[1]

SRI is taking a strong hold in Cambodia, with over 100,000 farmers using its practices. In Myanmar, as of 2008 more than 50,000 famers are practicing SRI. It is spreading also in Bangladesh, Philippines, Vietnam and Nepal. Beyond Asia, which is considered to be the global rice bowl, SRI is spreading in Africa, the continent from where it was originated, and in number of countries in South America. As concern for preserving our precious natural resources mounts, the use and effectiveness of SRI will continue to increase. Unlike other modern technologies, SRI has no ecological cost. Rather, it can improve the overall environment and ecosystem over time by improving the soil quality, saving water, and reducing or minimizing unnecessary chemical use. It is possible that SRI will be the standard approach to growing rice in most of the world in the coming future.

Common errors and mistakes at initial stages

Farmers trying SRI first time have been observed to make a number of common mistakes. Besides, there are certain misunderstandings among the extension workers or service providers to farmers. If these can be avoided, there are higher chances that SRI will be more successful.

Among the misunderstandings there is a common belief that trying SRI the first time holds certain risk; therefore, farmers deserve some compensation if there is a crop failure. It should be noted that SRI is not really more risky than other rice cultivation systems.

[1] The information provided in this paragraph is from an article written by Prof. Uphoff in February, 2008 for the international media.

Evaluations of SRI in Sri Lanka by IWMI and in Cambodia by GTZ in fact found SRI methods greatly reducing farmers' risks of economic loss. The trials generally conducted by farmers with SRI are basically adaptive trials. What the results will be is already pretty well known. Therefore, there is not much chance of loss. If there is a crop failure, this will be due to natural calamity or disaster, in which case any rice crop will be affected, and in general, SRI plants have a better degree of resistance because of their deeper and stronger root system. There are many examples where normal rice has been destroyed by flood or drought, while SRI rice was able to withstand such calamity.

Another misunderstanding is that as there is a risk, SRI trials should not be conducted in a large area. As it is new and labor-intensive, it is wise to try SRI in a small area at first so that more management care can be given to the field, while farmers are acquiring skill and confidence in the new methods. But there are certain advantages when trials are conducted in a larger area. Neighboring farmers always take results from larger areas more seriously. A small trial does not simulate farmers' actual conditions as well. Conducting trials in a small area and extrapolating the yields to a large area such as ton/ha bears risk of errors.

A common risk or error associated with SRI trials is that the weeding often gets done late. It is difficult to remove weeds completely by rotary weeder once they have already grown up. Weeding should be done before the weeds take form, at the time of emergence. As the weeder disturbs the soil, weed will not be able to germinate and grow. This is how rotary weeders control weeds. At an initial stage, the growth of weeds is faster than of rice plants. Therefore, the first weeding should be done in 7-10 days after transplanting, preemptively curbing weed establishment.

Another error could be spacing. If the spacing is too great in a poor soil, total plant population will be less. Less productive individual plants may give a low yield per unit of area, although surely there will be no crop failure. It is always advisable to try in different spacings in a field so that at the end of the season, farmers can see which spacing is more appropriate for their field.

Many a time, young seedlings after transplanting could be damaged or washed away if there is flooded water in the field. Therefore, gap filling on the next day or two days later is an important task, which has not been seen to be common among farmers trying SRI first time. If gap filling is not done, it will again reduce the plant population. Having a few gaps will not significantly affect yield, as plants surrounding the gap fill in most of it, growing wider and more productively, so it will not be worth the effort to replant in every space.

All these points were discussed in details with the agriculture team as important tips for the upcoming trials in this season.

Discussions on various extension strategies

Various extension strategies have been used in disseminating SRI. Each strategy has its own advantages and limitations. Considering the innovative and exploratory nature of SRI work, a Farmer Field School (FFS) approach has been found effective in disseminating SRI to farmers. FFS considers farming is a matter of decision-making, such as which crop to grow, which method to use, how much area to cultivate, how much capital to invest and

so on. FFS provides farmers with knowledge on these particular subjects through an informal setting, using a field as the focus for observation and learning so that they can make better decisions according to their situations.

As SRI capitalizes on the interactions between rice plants and their growing environment such as soil, water, and other living and non-living organisms of the rice ecosystem, farmers found the informal setting of FFS more conducive to study all these matters in a very practical manner, and then to customize the practices according to their choices, interests and the conditions of the fields. The concepts of FFS, and how FFS has been adapted and expanded to many countries and crops, have been shared with project staff. Afterward, discussions were organized on how the approach can be adapted to a project for disseminating SRI.

Development of an action plan for the next season

Although FFS is an effective approach to disseminating SRI, it may not be possible to introduce the complete approach into the project, as less than a year is left to complete the project. It may, however, be worthwhile to incorporate some elements of FFS into the existing approach of the project. Among the elements, the 'group approach' to working with farmers was decided to be incorporated. Project beneficiaries, mainly farmers living along the canals, were grouped into 15 clusters. Among these, 7 clusters have been selected for SRI, and in the rest of the clusters the major interventions will be crop diversification and irrigation. Details about the clusters and number of farmers in each cluster are available in Annex 2.

Farmers in each cluster will be organized at a common place based on their convenience and will be given training at regular intervals on various aspects of SRI. In this regard, during the visit a training curriculum has been prepared with the agriculture team. In addition, several copies of a handbook on FFS written by the author of this report have been given to the team, in which how the training should be conducted is described in greater detail. The training will be organized in an actual situation. There will be a common study field in each cluster where farmers will have a chance to see how the practices are to be applied and observe their performance regularly. It will then be easier for them to apply the practices afterwards on their own fields. As there will be regular meeting/training in each cluster, they will also have chance to discuss any difficulties as they may encounter while practicing SRI on their own fields. This way, there will be more interaction among farmers to learn and share from each other.

An action plan has been prepared by the project team outlining the specific time period for each activity. Respective staff have been given the responsibility to carry out the activities with the selected farmers. Please see the details in Annex 3. According to the plan, training for the first rice crop will begin from 18 May and will continue at various intervals until the first week of September. Training for second crop will begin from 8 June and will continue up to the 3rd week of October. Training for crop diversification and irrigation will continue in a similar fashion during the same period in other clusters.

E Suggestions and recommendations

Close follow-up and monitoring

Follow-up is an important activity to oversee how farmers are using the practices on their fields, and what kind of difficulties they are facing in using those practices. This helps farmers avoid potential errors or mistakes in advance. Follow-up must start from the very beginning, especially from seedling production. Like training, it should be a regular activity in each cluster. A technical staff who will organize training for farmers should engage in follow-up activities.

Besides follow-up it is advisable to monitor the growth and the performance of SRI regularly so that at the end of the trials, concrete lessons could be drawn on what worked well and what needs to be improved. Monitoring the field and collection of regular data is also important to compare the performance of SRI with farmer's traditional practices, and within SRI, it is important to know which varieties, what spacing, how many days seedlings performed better, and how many times watering gave better results. During the visit, a monitoring format has been developed (please see Annex 4). It is advised to distribute this format to each farmer to record all necessary information about SRI. The project staff during training and follow-up visit should explain and help the farmers to fill up this format.

Cross-visits

Cross-visits among farmers are useful in sharing learning from each other. During the cross-visits, farmer could see which varieties and what spacing are performing better, and what common mistakes have been made. The trials of more successful farmers can influence the less successful ones. Cross-visits, moreover, can be another source of inspiration from each other. Other neighboring farmers, who have not participated in SRI, can also join in cross-visits. Cross-visits can be organized between farmers from different clusters at any time, from maximum tillering to before harvesting.

Field day

One of most effective tools for large-scale sharing of the results of SRI among farmers from the same communities or from different communities is conducting a field day. Field days should be organized either at maximum tillering, or at flowering stage, or they could be organized during the harvesting period. A field day should be organized at good or successful plots only, because it will be a source of inspiration and influence for the visiting farmers. Along with farmers, government officials, other NGO workers, and funding agencies should be invited to attend the field day to influence these key peoples for more support to disseminate SRI across the region.

When grown from a single seed, SRI rice is well-known for its pure quality, and thus it can be used for quality seeds. During the field day, if organized at the harvesting period, visiting farmers can be given good seeds from the harvested SRI plots, or arrangement could be made to exchange seeds later. This will help to expand the area for SRI next year.

Documentation of results and preparation of report

According to the plan, at least 50 farmers from 7 clusters are expected to participate in SRI trials this year. It is highly recommended that all the data from these farmers be compiled together, and in the end a report be prepared. The findings presented in the report could serve as the basis for future activities on SRI in the region.

Along with the report, it is also recommended to document the major activities of each cluster into a register book, such as how many farmers participated in SRI trials, what trainings were conducted, what were the topics, how many have used SRI in the first year, on how much area, who used what varieties, how many farmers participated in the field day, how many of them are planning to use SRI in the next year. This recorded document could enrich the quality of reports and also serve as an authentic source of data for monitoring and evaluation of the project activities/performance.

Future activities and the potentials of SRI

SRI has high potential in this region for a number of reasons. The soil characteristics, which are sandy loam to loam, are highly supportive to SRI. Although SRI can perform better in poorer soil, these high-quality soils are an advantage for higher yields. The initial result of nearly 10 t/ha by a successful farmer in the last season has already confirmed this.

Among the cereals, most notably rice and wheat, rice is considered to be more profitable. Over the years, rice cultivation has increased significantly, and in the near future it will grow further, given that there is enough supply of water. Although potato can be considered another economic crop as grown widely, and there is opportunity to increase its yield further, the lack of cold storage facilities has limited its potential for improvement. Rice being easy to store and transport is thus becoming the most economic crop in the region, and it could be an important source of raising farmer’s income from agriculture.

A comparison of cost and return analysis between traditional methods and SRI, based on last year’s yield, has indicated that the use of SRI could raise the income from rice four-fold, requiring much lesser amount of investment for similar amount of production. Please see Annex1 for the details. This will make rice cultivation more profitable for both large and small farmers. But the small farmers will find it more remunerative, being able to employ their own household labor as SRI is more labor-intensive at the beginning.

SRI could be an important vehicle for better management of water. As the demand for water is increasing, there is a growing concern over how this water can be successfully managed. One way to improve the efficiency of water is to minimize the current water loss through improving the physical structures of the canals and irrigation channels. Another way is to increase the efficiency of water use for various crops is through on-field water management. Considering the large and long-term investment that is needed for the first option, most organizations working in the region are focusing on the second option, which is easier and more affordable. In such a situation, the use of SRI, which can save at least 50% of the water needed for growing rice compared with traditional methods, could be the most effective on-field water management system in the region, leading to increases in the efficiency of water use by more than 200%. This way, SRI could be an important milestone in the on-going development initiatives in the region.

Considering this immense potential of SRI as a successful entry point for community development in heavily war-torn rural Afghanistan, it is recommended that the project make serious efforts to implement the newly developed plan for SRI. There is strong possibility that the plan will be successful if the necessary follow-up activities and supports are given to farmers. This success, however, will be just the first step to disseminate SRI in a large-scale. Considering that this result has a strong basis and there is an effective opportunity to continue the process of rebuilding war-torn rural communities, a larger follow-up program on SRI is highly necessary and timely.

Based on the effectiveness and the success of FFS elsewhere, not just in promotion of SRI but as an effective approach to community development, the new program can consider introduction of FFS as the basic approach to working with rural Afghan communities. In such case, preparations need to begin being made before the current project ends in December this year, or there should be at least a three-month preparatory phase before the new phase begins.

Annex 1:

Cost and net returns of rice in traditional and SRI methods in terms of volume of rice produced (per jirib or 2000 square meters)

Production cost		*Traditional (kg)*	*SRI (kg)*
Seed:		28	1
Labor:			
Seedling preparation	1 person	8	8
Transplanting	3 person	24	48
Irrigation	1 person	8	8
Weeding	1 person	8	32
Harvesting	3 person	24	24
Ploughing /land preparation	600 Afs	24	24
Total		**124**	**145**
Rice yields		**600**	**1960**
Net return		**476**	**1815**

Annex 2:

Proposed cluster, number of farmers, and major interventions

Canals	No	Cluster	Total farmers	Interventions			Person responsible
				SRI	Crop diver.	Irrig	
Shahrawan	1	Kunchi /Qarapurchaw	9	9	9	9	Ghiasudin
	2	Chaila	9		9	9	Ghiasudin
	3	Mula Ysuf	21		21	21	Talibshah
	4	Yengareq	19		19	19	Talibshah
	5	Dosad	15		15	15	Talibshah
Asqalan	6	Asqalan	3	1	2	2	
	7	Tubrakash	37	3	34	34	Ghiasudin/Talibshah/ Ibrahim
Sufi	8	Sufi	33	12	21	21	Ghiasudin/Talibshah Ibrahim
	9	Qariteem / H.Shir Ali	5	5		5	Ghiasudin/Talibshah/ Ibrahim
	10	Madrasa	6	6		6	Ghiasudin/Talibshah Ibrahim
	11	Kolabi	7	7		7	Ghiasudin/Talibshah/ Ibrahim
Turbguz guzar	12	Turbguz guzar	8	2	6	6	Ghiasudin/Talibshah/ Ibrahim
	13	Olam shakh					
Qala-e-Zal	14	Wakil Akhtar	28		28	28	Talibshah
	15	Chagareq	17		17	17	Talibshah

Annex 3:

Action plan for upcoming season on SRI and crop diversification

First crop

Activities	May	June	July	August	September	October
Nursery establishment	18-22					
Land preparation manuring	18-22					
Transplanting		1 to 5 June				
Weeding		From 8 -12June		7 of August		
Irrigation		From 8 -12June			18 of Sept	
Monitoring on			From 27 July		4 of Sept	
Harvesting						From 21 Sept

Second crop

Nursery establishment		8-12 June				
Land preparation manuring		8-12 June				
Transplanting		22-26 June				
Weeding			From 6-10 July	21 of August		
Irrigation			From 29 June			30 of Sept
Monitoring on				10 August to 11 September		
Harvesting						From 30 Sept

Crop diversification

Activities	May	June	July	August	September	October
Soil analysis	18-29 May					
Land preparation		1-12 June				
Stream works		15-26 June				
Monitoring /follow up activities						

Annex 4

Monitoring format

Basic information

Farmer's name:	Cluster/village:
Plot size:	Variety:
Transplanting date:	Seedling age:
Spacing:	Harvesting time:
No. of tillers/hill:	No. of panicles/hill
No. of grains/panicle:	Panicle length:

Management operations

Date	Activities	Labor inputs (no. of days used)	Other inputs used
(example)			
6/6/2008	irrigation	0.25	
6/6/2008	weeding	1	
15/6/08	top dressing	0.25	50 kg (animal manure)
16/6/08	irrigation	0.25	
16/6/08	weeding	1	