PROGRESS REPORT

CONSERVATION AGRICULTURE FOR IRRIGATED AREAS IN AZERBAIJAN, KAZAKHSTAN, TURKMENISTAN AND UZBEKISTAN

November – 22, 2011

Tashkent, Uzbekistan

Submitted by

ICARDA

PROGRESS REPORT COVER PAGE

Project Title:	**CONSERVATION AGRICULTURE FOR IRRIGATED AREAS IN AZERBAIJAN, KAZAKHSTAN, TURKMENISTAN AND UZBEKISTAN**
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Countries:	**Azerbaijan, Kazakhstan and Uzbekistan**
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Date of Report: Author of Report: Dr. Aziz Nurbekov

Reporting Period: September – November Approved by:

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Demonstration and research activities were carried out in at least one selected benchmark site of 25 ha size per country. The selection criteria were developed by project regional coordinator and national consultants of the project in each country taking into account local conditions in agriculture of the participating countries in the project during the national seminars which were held February through March 2011. These sites were selected at the beginning of project operations and they represented the most significant ecological zones in each country. Project regional coordinator and the project team and local counterparts agreed on project farms for each country. These demonstrations plots will be used to provide field and formal training courses and also field days for demonstration of conservation agriculture to the farmers and for training of farmers, extension specialists in crop management.

Visit of FAO experts Drs. T. Friedrich and Hafiz Muminjanov to Azerbaijan, Kazakhstan and Uzbekistan in October 2011 was facilitated by ICARDA-CAC in close consultation with SEC and AGP. ICARDA scientist Dr. A. Nurbekov accompanied the FAO experts' mission to project demonstration site in Terter (Azerbaijan), Sayram (Kazakhstan) and Kasbi (Uzbekistan).

12 National Consultants were selected and approved. Recruitment of subject matter specialists on crop production, water management, farm mechanization and economics, in each country, is done. In general selection of National Consultants was done by the Governments of respective project countries and in all cases was based on expertise in particular areas of the Project.

So far only soil moisture meter provided for each country while other equipments such as boom sprayer from Turkey, zero-till planters from Brazil are not arrived yet. In all, in spite of delayed equipment delivery, the project team led by National Project Coordinators and Managers in each country under technical backstopping from ICARDA-CAC office was able to accomplish major outputs planed in the Project Document, and made good start for more successful implementation of the work plan in 2012, the second year of the Project.

Three field days were organized, in Azerbaijan, Kazakhstan and Uzbekistan, to bring farmers, extension agents and researchers to observe and discuss key technology issues on conservation agriculture. Farmers from the project demonstration site, and adjacent areas participated and became acquainted with conservation agriculture practices.

Zero-till planter from Brazil will be in place most probably in December and this will give opportunity to do work without delays starting spring next year. However it is necessary to improve tender procedure of delivering equipments in time for smoothly implementation of Project activities. During the previous period the procedure was quite long lasting. As a result of this some important field works were done with considerable delay, which in agriculture may lead to complete failure. In Azerbaijan the project team could borrow no-till planters from a neighbouring FAO project and managed to establish a no-till crop and a double crop of maize following wheat. The bedplanter used in Kazakhstan is an own development, modifying a conventional disk seeder to a bed planter, with the advantage over the models from Turkey seen in other parts of the project, that the disk furrow openers can handle residues and that they follow the contour for each bed independently and are not fixed. For winter seeding of wheat the project team in Uzbekistan has borrowed a Happy Seeder from the ZEF-UNESCO project in Urgench, Uzbekistan.

Furthermore some unusual weather conditions in Central Asia jeopardized some of the project activities. This year was the first year of the project and startup of the project coincided with water shortage during the vegetation period of winter wheat and spring barley in all project demo sites across the countries. This is why it was not easy to try to implement any improved cropping practices on conservation agriculture in such conditions.

The best improved irrigation technology and crop rotations will be identified and will be recommended to be adopted in the project countries and introduced to the farms of the country. Farmers' perceptions and preference will be monitored. Economic impact of the traditional and bed planting technologies will be assessed. The project also plans to produce a signal variant of no-till planter in Uzbekistan which already designed by the Prof. Alim Pulatov and his team. Nowadays some details of the newly designed no-till planter are going to be finished and will be produced in a factory located in Karshi, nearby project site in Uzbekistan.

The best crop management system of conservation agriculture will be recommended to be used in the farm conditions and introduced to the farms of the region. Farmers' perceptions and preference will be monitored. Economic impact of the traditional and conservation agriculture technologies will be assessed.

For all activities, field days, formal and field training courses will be organized for farmers and policy makers during the cropping cycle to promote information exchange and encourage adoption.

Year 2012 or the next reporting period will be the key period for the implementation of the project. As the project teams are complete in the project countries and administrative problems and uncertainties that occurred in the first year have been solved and clarified, smooth implementation is expected. However, the success of the project depends on the support and personal engagement of all involved personal in the project including project regional coordinator, national project coordinators, national project managers and at the national partner institutes. Fortunately, we are working in all countries with highly motivated and enthusiastic partners that are trying hard to make the project a success and also to reach success on conservation agriculture in the region.

During the field visits and field works on project sites all works were done together with farmers and in general they are happy that they were selected. Some neighbor farmers while attending field days expressed their willingness to join the Project if possible.

Visit of FAO experts Drs. T. Friedrich and Hafiz Muminjanov to Azerbaijan, Kazakhstan and Uzbekistan in October 2011 was facilitated by ICARDA-CAC in close consultation with SEC and AGP. ICARDA scientist Dr. A. Nurbekov accompanied the FAO experts' mission to project demonstration site in Terter (Azerbaijan), Sayram (Kazakhstan) and Kasbi (Uzbekistan).

INTRODUCTION

The Government of Turkey, represented by the Ministry of Agriculture and Rural Affairs (MARA) and FAO concluded, in mid-2006, an Agreement whereby setting up an FAO/Turkey Partnership Programme (FTPP) with an annual trust fund contribution of USD 2 million by the Government of Turkey over an initial period of five years (2007– 2011) at the benefit of the countries assisted by the FAO Sub regional Office for Central Asia (FAO/SEC).

The project "Conservation Agriculture in Irrigated Areas of Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan" is funded by the FAO/Turkey Partnership Programme (FTPP) established over an initial period of five years (2007 – 2011) at the benefit of the countries assisted by the FAO Sub regional Office for Central Asia (FAO/SEC).

The Project Document has been prepared by FAO experts. After the signature of the relevant Arrangement by the Ministry of Agriculture and Rural Affairs (MARA) of Turkey and FAO the project document sent to countries for their signature. The project became operational when Kazakhstan and Uzbekistan are signed the project document.

ICARDA is providing technical backstopping to the project on conservation agriculture as per a Letter of Agreement between FAO and ICARDA. This progress report on "Conservation Agriculture in Irrigated Areas of Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan" was prepared as per letter of agreement. This progress report covers the period from 1 September – 30 November 2011.

The first annual work plan specified detailed activities for each country and project site. The section on project progress and outputs in this progress report is organized accordingly by country and sites. The report is based on progress made during the implementation of the project for the period September-November including some preliminary descriptive results.

In brief the major activities in the six months progress report included:

- Development of the sampling frame and the questionnaires for the baseline study in project countries of Central Asia and Azerbaijan
- Nine different crops were planted on beds using Turkish bed planter (Azerbaijan) and locally made bed planter (Kazakhstan and Uzbekistan
- Selection and recruitment of National Consultants
- Harvest succeeding crops after winter wheat
- Topsoil samples were taken from all project site's fields for chemical analysis
- Preparation and start of field experiments on bed planted winter wheat in Autumn 2011
- Winter wheat planted with no-till drill at the end of October 2011
- A new zero-till drill designed on base of locally produced cotton inter row cultivator

A. PROGRESS AND OUTPUTS

In the time of Soviet Union, farming areas were planted with cotton in rotation with alfalfa in Azerbaijan and Uzbekistan, while in South Kazakhstan, wheat was rotated with vegetable crops. Cotton occupied up to 80% of cropland in Ganja and Kashkadarya provinces of Azerbaijan and Uzbekistan respectively. The remaining cropland was dedicated to alfalfa and other forages. As cotton and wheat are primarily contracted crops by the Government of Uzbekistan, the farmers in this area switched to cotton monoculture, relying on supply of inputs through Governmental channels. Currently in Ganja, winter wheat, barley, and cotton occupy 80% of the total arable area. In order to obtain food security, wheat became the most important crop in the region.

I. Raised-bed planter and land levelling technology adjusted and applied and lower and more efficient water utilization for the crop rotations introduced, as compared to traditional cropping systems

Crop rotation is an integral part of the crop production system. The greatest benefit to a good crop rotation is increased yields. A well-planned crop rotation will help in insect and disease control and will aid in maintaining or improving soil structure and organic matter levels. Using a variety of crops can reduce weed pressures, spread the workload, protect against soil erosion and reduce risk. Legume crops in the rotation have become more valuable with the increased cost of nitrogen. Research and experience have proved that a good crop rotation will provide more consistent yields, build soil structure and increase profit potential. Crop rotations for the selected farms were developed taking into account farmers' interest and also marketability of the selected agricultural crops of the project throughout the project countries (Please see annexes 1, 2 and 3).

Azerbaijan

Bed planted wheat

Wheat (Triticum aestivum) was planted on two different planting methods on beds and broadcasting (Please see annex 11.1). Bed width was 70 cm and three rows of winter wheat were planted. The winter wheat variety, Azamatli-95, was sown at a rate of 130 kg ha-1 while the same variety was planted by using the broadcasting method at a seeding rate of 200 kg ha -1. Grain yield was significantly affected by this planting method. The maximum grain yield of 5.51 t ha-1 was recorded in Ehtibar Jumshudov's farm in bed planted wheat while the minimum grain yield (2.51 t ha-1) was recorded in Mehmon Babave's field on the broadcasted method (Table 1). According to the results obtained from the first project year, bed planting method improves yields, save seed, save on an average of 36 % water.

Table 1. Wheat Yield Response to planting method

Planting method	Wheat grain yields (t/ha)[1]		Saved water, %	
	Ehtibar Jumshudov farm	Mehmon Babaev farm	Ehtibar Jumshudov farm	Mehmon Babaev farm

[1] All wheat treatments were fertilized with 90 kg/ha of N and 60 kg/ha P.

Bed planted	5.37	4.53	36 %	36%
Broadcasted	3.52	3.25		

Bed planted Sugar beet

Sugar beet was planted on 1 April, 2011, on 4 ha of Ehtibar Jumshudov's farm at a seeding rate of 8 and 12 kg ha -1, by using two different planting methods such as bed planting and mega (or broadcasting) planting. During the vegetation period, sugar beet was irrigated twice and fertilized once. Field performance of the crop in two different planting methods was good. According to the results obtained, bed planting practices improved yields, saved on an average of 50% seed, and saved water 25% when permanent beds were used (Table 2).

Table 2 Sugar beet yield (t/ha) as affected by planting method

Sowing method	Seed rate	Yield, t/ha	Extra yield, (t/ha)	Water saving using bed vs flat, %
On raised-bed,	8 kg/ha	28,5	6.0	25
Broadcasting	12 kg/ha	22,5	0	

Bed planted Chickpea

It was recommended by the project to plant Chickpea (*Pisum sativum*). The crop was planted on beds on Ehtibar Jumshudov's farm at the seeding rate 4 kg ha -1 to demonstrate benefit of raised beds on chickpea cultivation in the irrigated conditions of Ganja province. During the vegetation period of the crop, irrigation was given on the rate of 550 m3 ha -1. Yield of bed planted chickpea was 1.7 t ha -1.

Kazakhstan

Winter Wheat

This year was the first year of the Project and startup in South Kazakhstan coincided with very unusual weather conditions for plant growth and development because there was continuous drought during the vegetation period of agricultural crops. As farmers increasingly adopt resource conserving farming practices, there is a need for wheat that better adapts to new agronomic practices. Wheat was planted under irrigated conditions on two farmer fields on beds. The bedplanter used in this case modifies a conventional disk seeder to a bed planter, with the advantage over the models from Turkey seen in other parts of the project, that the disk furrow openers can handle residues and that they follow the contour for each bed independently and are not fixed. Wheat was planted using the bedplanter at a seeding rate 140 kg ha -1 while in the broadcasting method the seeding rate was 200 kg ha -1. The best sowing rate with regard to grain yield across planting methods was bed planting. The benefits of planting wheat on beds in irrigated systems in terms of yield and water savings from various farms of project demonstration site are given in

Table 2. Water savings, as indicated are significant and range from 28-30%, which is an extremely crucial issue in the conditions of South Kazakhstan.

Table 2. Wheat Yield Response to planting method

Farm	Wheat yield, t ha -1		Extra yield, t ha -1	Saved water, %
	Bed planted	Broadcasted		
Sattarkhonov Musakhon	4.32	3.74	0.58	28
Yusufjonov Gafurjon	3.87	3.34	0.53	3

Spring barley

For the first time in the irrigated conditions of South Kazakhstan province, spring barley was planted on beds. Low yields (1.7 t ha -1) of spring barley were obtained, the main reason being unusual weather conditions in spring where temperatures reached 35^0 C during the tillering stage and temperatures were even higher during the grain filling period. Additionally, water shortages restricted the growth of spring barley.

Uzbekistan

Cotton

Cotton is the main strategic crop in Uzbekistan. The project team used a 90 cm row width with furrow irrigation for cotton, which forms a raised bed between the furrows. The effect of different bentonite rates and microzum-2 on the productivity of cotton was tested in this experiment. There were four treatments: 1) control no bentonite application; 2) bentonite with 2000 kg/ha; 3) bentonite 2500 kg/ha; 4) 3500 kg/ha. A rate of 180 kg N ha-1 (urea) was applied across the whole experiment. In addition, 90 kg P ha-1 was broadcast applied prior to planting cotton. The highest yield was recorded (2.78 t/ha) in the third treatment (bentonite 2500 kg/ha) while the lowest plant height was recorded (2.58 t/ha) in the fourth treatment where the bentonite application rate was 3000 kg/ha. Water savings ranged from 10-12%, which was an extremely crucial issue in the conditions of Kashkadrya province in the current year where water shortage significantly affected the cotton yield.

Soy bean

Central Asia is the region of origin for soy bean (Glycine max (L) Merrill). The crop is the oldest cultivated crop not only in Uzbekistan but one of the world's oldest cultivated crops. It has been given recent prominence because of its broad utility and versatility for both human and animal nutrition, soil fertility, industrial usefulness, and geographical adaptability. Despite the above-mentioned characters and its ability to grow well with no added N fertilizer, soybean cultivation in Uzbekistan has not been substantial and the

crop is not widely grown in Uzbekistan because cotton and winter wheat are strategic crops. However, demand is growing. The Uzbek-6 variety of soy bean was planted on eight different treatments using the bed planting method. Treatments applied in this experiment were a control that received no K or P fertilization (Control) and *Rhizobium*, second and third treatments received K 60 and P 120 (K 60 and P 120) and no *Rhizobium*, while remaining treatments received *Rhizobium* and P and K fertilizers combined: *Rhizobium* +K60, *Rhizobium* +P120, *Rhizobium* K60+P120. Soybean following the first corn crop was not fertilized. Plant height, growth, and grain yield were observed during the vegetation period. The maximum plant height was observed in the treatment where *Rizobium*+K60+P120 was applied while the lowest plant height was observed in the control variant (Please see table 3). Soybean grain yield varied among the treatments. The eighth treatment (Control+Rhizobium K60+P120) received the highest grain yield 2.23 t ha -1 and the control treatment got the lowest grain yield 1.62 t ha -1.

Table 3 Plant height and Grain yield of bed planted soy bean affected by different fertilization rate and Rhizobium

Treaments	Plant height, cm	Grain yield, t/ha	Yield difference, t/ha
Control	82.3	1.62	
Control+K60	88.8	1.87	0.25
Control+P120	92.9	1.93	0.31
Control+K60+P120	95.6	1.99	0.37
Control+Rhizobium	91.5	1.89	0.27
Control+Rhizobium +K60	95.5	2.03	0.41
Control+Rhizobium +P120	99.2	2.14	0.52
Control+Rhizobium K60+P120	104.8	2.23	0.61

Soil samples were obtained for studying soil chemical, physical, and mechanical properties. The samples were taken from all project fields throughout the project countries at 60 cm depth in every 10 cm to determine soil density, humus content, total phosphorus, nitrogen, and potassium.

Zero-till planters from Brazil have not yet arrived. This equipment will be used for planting spring crops in spring and summer next year. In the absence of this equipment, the first approach was given to diversification. In some cases farmers could borrow no-till planters from a neighbouring FAO project and establish a no-till crop and a double crop of maize following wheat. Bed planters from Turkey are available and used in the first year to establish the beds, but they are not suitable for subsequent no-till seeding into the beds.

National consultants in Uzbekistan, based on instructions from Dr. T. Friedrich, with efforts of Dr. Alim Pulatov and Yo Kholiyorov designed a new zero-till planter based on locally-produced cotton inter row cultivators (this is a draft design). The cotton inter row cultivator will be used as the base for modification and development of a multi-crop and multiuse direct seeder with bed making tools. The modification of the equipment for direct sowing will be included in the installation of newly designed working points, namely cutting disks, drill coulters (chisels) and cultivators (bed-makers). Currently, all design work of the new zero-till drill is completed. A draft of the new zero-till planter will be made in December and will be ready for the next cropping season in spring 2012.

II. Improved crop production and management through accelerated adoption of conservation agricultural practices

Improved crop production is good for farmers and good for the environment. Improved crop production systems have a great potential to increase agricultural production in the project countries. Wheat is the easiest crop to begin conservation agriculture while after wheat harvest succeeding crops can be cultivated. Many crops can be used for double cropping after wheat harvest in the irrigated conditions of Central Asia and Azerbaijan. In this context maize, mungbean, pearl millet, kidney bean, and sorghum are used as summer crops after the wheat harvest in the project demonstration sites.

Azerbaijan

Maize (*Zea mays*) was planted after winter wheat by using no-till planter at the seeding rate 30 kg ha -1 in Ehtibar Jumshodov's farm. There were three different treatments in this experiment and were namely 1) conventional tillage (control); 2) minimum tillage; and 3) no-tilled. Field observations were carried out during the vegetation period of the planted crop (please see pictures 1 and 2 at annex 4). The results showed that the field germination of maize showed about 8 and 10% less plants in the no-till plots as compared to the conventional and minimum tillage correspondingly. It appears that the wheat plants in no-tillage situation tillered more than the conventionally wheat since fall stands were lower under no-tillage. There was a small difference between the yields of no-till and conventional by planted maize after winter wheat harvest in on-farm trials in 2011 (Please see table 4). Even with a small difference in crop yields, no-till systems have an advantage in reduced cost of production.

Table 4 Effect of tillage methods on productivity of maize

Treatments	Field germination, %	Plant height, cm	Grain yield, t/ha
Control (Conventional tillage)	78.3	228	5.1
Minimum tillage	71.8	221	5.0
No-tilled maize	70.5	218	4.9

The dual-propose variety of pearl millet **[***Pennisetum glaucum* **(L.) R.Br.]** originating from ICRISAT was tested at Ahmad Ibragimov's farm on 3 ha as a succeeding crop after the winter wheat harvest in the irrigated conditions of Azerbaijan. Field emergency of pearl millet was good and grain yield amounted to 2.2 t/ha.

The introduction of pearl millet in the wheat-based cropping system may help to resolve to some extent the wheat nematode problem. This beneficial aspect of summer forage crops should be further investigated in the next year.

Kazakhstan

For the first time in the irrigated conditions of South Kazakhstan province of Kazakhstan, kidney bean *(Phaseolus vulgaris)* and mungbean *{Vigna radiata (L.) Wilczek}* were planted on raised beds as a succeeding crop after winter wheat and spring barley respectively while conventional planting was a control. Both crops planted on beds by using locally made bed planters (please see picture 4). This crop was harvested for grain yield to determine the effects of the planting methods. It appears that mungbean tends to yield more where bed planters were used. The mungbean provided 0.17 t ha -1 (20.1%) yield advantage on bed planting compare to broadcasting method, which was significantly different. Water savings ranged from 20-

32%, which was an extremely crucial issue in the conditions of South Kazakhstan in the current year where water shortage significantly affected mungbean yield.

Table 6 Effect of bed planning on the yield of mungbean crop (2011)

Type of planting method	Grain yield, t ha -1	
Broadcasting	0.64	-
Bed planting	0.81	0.17

Kidney bean was harvested in the beginning of November (Please see pictures 3 and 4 at annex 4). The grain yield of kidney bean increased with seeding rate. Grain yields increased with higher seeding rates from 0.56 t ha -1 in the control, to 0.73 and 0.86 t ha -1 with seeding rates 100 and 120 kg ha -1 respectively.

Considering double cropping in summer 2011 after harvest of winter wheat, maize was planted on 22 July, 2011, at a seeding rate of 30 kg ha -1, the spacing of the major furrows was at 70 cm. Maize dry mass yield with bed planting was 18.8 t/ha while traditional planting method yielded 17.1 t/ha.

Uzbekistan

At the Sobir farm, 1 ha of mungbean {Vigna radiata (L.) Wilczek} was broadcasted by hand, which is a common practice these days on small farms, on 21th of July at a seeding rate of 20 kg ha-1 while the other 1 ha of mungbean was planted on beds at 12 kg ha -1. Mungbean planted after the winter wheat harvest.

Mungbean field germination rates were significantly higher with the bed planting method compared to the broadcasting method. The results for grain yields shows that bed planted mungbean (2.24 t/ha) had significantly higher yields than broadcasted mungbean (1.85 t/ha). Please see table 7.

Table 7 Effect of planting method on mungbean grain yield (2011)

	Bed planted	Broadcasted	Bed planted	Broadcasted	
Crops	Field germination, %	Field germination, %	Grain yield, t ha -1	Grain yield, t ha -1	Yield difference, t ha -1
Mungbean	82.2	69.2	2.24	1.85	0.39

At the Sobir farm, 1 ha of maize (Zea mays) was also broadcasted by hand on 21th of July at seeding rate 40 kg ha -1 while the other 1 ha of maize was planted on beds and 30 kg ha -1. The method of planting had a significant effect on the dry mass yields of maize. Maize dry mass yields increased with planting method. The maximum dry mass yield (23.2 t ha-1) was recorded on the bed-planted maize and the minimum dry mass yield (22.4 t ha -1).

Winter wheat

Winter wheat was planted at the end of October with an Indian no-till planter. For winter seeding of wheat, the the project team borrowed a Happy Seeder from the ZEF project in Urgench. No-till sowing had not been practiced at this site prior to the experiment. Seed was placed with 4 cm of soil cover while the seeding rate was 140 kg/ha. Field germination began in mid-November 2011 and field performance of winter wheat was good (Please see pictures 5 and 6 at annex 4).

During the field visits and field works on project sites all work was conducted together with farmers and in general they were satisfied that they were selected. A few neighboring farmers attended field days and expressed their willingness to join the Project if possible.

III. Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners

All on-farm field days were carried out within the selected project farms during the project implementation period. The first field day was organized on May 21st in Azerbaijan, the second on June 16 in Kazakhstan, while the third field day was organized on August 24, 2011.

FAO evaluation mission

A visit of FAO experts (Drs. T. Friedrich and Hafiz Muminjanov to Azerbaijan, Kazakhstan and Uzbekistan in October 2011) was facilitated by ICARDA-CAC in close consultation with SEC and AGP. ICARDA scientist Dr. A. Nurbekov accompanied the FAO experts mission to the project demonstration site in Terter (Azerbaijan), Sayram (Kazakhstan) and Kasbi (Uzbekistan) (please see pictures 7 and 8 at annex 4).

B. INPUTS

I. National consultants

Each concerned country appointed a National Project Coordinator (NPC) to be located on-site and to provide full-time orientation, coordination and supervision during project implementation. 12 National Consultants were selected and approved. Recruitment of subject matter specialists on crop production, water management, farm mechanization and economics, in each country, is completed. In general, selection of National Consultants was conducted by the governments of respective project countries and in all cases was based on expertise in particular areas of the Project. National consultants were recruited according to FAO procedures. The national consultant in crop management will work as a national project manager (NPM) and will coordinate all field activities including planting of crops, field days, field formal training courses, etc. The reports of national consultants will be presented elsewhere. A list of approved project national consultants is provided in table 8.

Dr. Aziz Nurbekov, Project Regional Coordinator, continued to communicate with FAO, Ministry of Agriculture, and the National Project Coordinators and Managers and undertake technical monitoring for the day-to-day activities of the project. He was involved in all decisions on Project activities.

II. Equipment received during the reporting period

Thus far, only a soil moisture meter provided for each country was received, while additional equipment such as a boom sprayer from Turkey and zero-till planters from Brazil have not yet arrived. Despite the delayed equipment delivery, the project team led by National Project Coordinators and Managers in each country under technical backstopping from ICARDA-CAC office was able to accomplish major outputs planed in the Project Document, and made a good start for additional implementation of the work plan in 2012, the second year of the Project.

III. Training activities during the reporting period

The Project document required the organizing of training of private farmers involved in the project together with extension staff on integrated crop management, improved irrigation and water conservation practices with key topics related to the introduction of new range of crops, weed control (use of chemicals), crop residues/cover crops, crop rotations, direct drilling, irrigation frequency, harvest, and crop storage. Three field days were organized, in Azerbaijan, Kazakhstan and Uzbekistan, to bring farmers, extension agents, and researchers to observe and discuss key technology issues on conservation agriculture. Farmers from the project demonstration site, and adjacent areas participated and became acquainted with conservation agriculture practices.

Table 8 List of National professional staff assigned to the project during the reporting period

Names	Functions
Azerbaijan	
Dr. Asad Musaev	National Consultant in crop production and National Project Manger
Dr. Kamil Fataliyev	National Consultant on Farm Mechanization
Dr. Akif Valiev	National Consultant on Farm Economics
Dr. Seymur Safarli	National Consultant in Irrigation/water management
Kazakhstan	
Dr. Dossumbek Sydyk	National Consultant in crop production and National Project Manger
Dr. Rahim Medeubaev	National Consultant on Farm Mechanization
Dr. Natalya Gritsenko	National Consultant on Farm Economics
Dr. Azhar Karabalaeva	National Consultant in Irrigation/water management
Uzbekistan	
Dr. Zokhidjon Ziyadullaev	National Consultant in crop production and National Project Manger
Dr. Yormamat Kholiyarov	National Consultant on Farm Mechanization
Dr. Abdumalik Namozov	National Consultant on Farm Economics
Dr. Ravshan Boyirov	National Consultant in Irrigation/water management

C. PROBLEMS ENCOUNTERED AND ACTIONS TAKEN OR REQUESTED TO RESOLVE THEM

The GCP project on conservation agriculture has been implemented with difficulties associated with some natural constraints because of the very difficult financial situation in the farm sector. Implementation of planned activities has been initiated with a delay due to the following reasons:

- National consultants were recruited in September through October and there were some communication problems with all national consultants due to limited internet connections.
- Due to the seasonality of field activities, for some interventions the entry point for implementation is in April/May, which was not possible in 2011.
- The partner national institutes have been very slow in actively searching for and involving young scientists as researchers in the project activities. In the reporting period, most students were assisting senior staff but not actively pursuing field research for obtaining a degree.
- In all participating countries a large range of research and development projects compete for the available expertise and scientists are used to receive relatively large honorariums for their participation. Our project is not able to match this expectation and had to search for scientists who were willing to accept less compensation for their time, which made finding suitable candidates more challenging.
- Zero-till planter from Brazil will be in place most probably in December and this will provide an opportunity to do work without delays starting spring 2012. However, it is necessary to improve the tender procedure of delivering equipment in time for the smooth implementation of Project activities. During the previous period the procedure was quite long, and as a result, some important field work was completed with considerable delay. An Indian zero till drill from the ZEF-UNESCO project in Khorezm was rented to plant winter wheat in Uzbekistan.
- Unusual weather conditions in Central Asia jeopardized some of the project activities. This year was the first year of the project and startup coincided with a water shortage during the vegetation period of winter wheat and spring barley in all project demo sites across the countries.

D. WORK PLAN AND EXPECTED OUTPUTS FOR THE NEXT REPORTING PERIOD

I.WORK PLAN

For more details please see annex 5.

II. EXPECTED OUTPUTS FOR THE NEXT REPORTING PERIOD

II.I. **Raised-bed planter and land levelling technology adjusted and applied and lower and more efficient water utilization for the crop rotations introduced, as compared to traditional cropping systems**

The best improved irrigation technology and crop rotations will be identified and will be recommended for adoption in the project countries and introduced to the farms of the country. Farmer perceptions and preferences will be monitored. The economic impact of the traditional and bed planting technologies will be assessed.

The project also plans to produce a signal variant of a no-till planter in Uzbekistan which has been already designed by Prof. Alim Pulatov and his team. Details of the newly designed no-till planter will be finished and produced in a factory located in Karshi, near the Uzbekistan project site.

II.II. Improved crop production and management through accelerated adoption of conservation agricultural practices

The best crop management system of conservation agriculture will be recommended to be used in the farm conditions and introduced to the farms of the region through booklets and posters. Farmer perceptions and preference will be monitored. Economic impact of the traditional and conservation agriculture technologies will be assessed. Collaboration with other projects on conservation agriculture will take place to exchange experiences and equipment. Booklets and posters on the project results will be produced and will be distributed during field days and training courses.

II.III. Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners

For all activities, field days and training courses will be organized for farmers and policy makers during the cropping cycle to promote information exchange to encourage adoption.

The next reporting period (2012) will be the key period for the implementation of the project. As the project teams are complete in the project countries and administrative challenges and uncertainties that occurred in the first year are solved and clarified, smooth implementation is expected. However, the success of the project depends on the support and scientists engaged in all aspects of the project including the project regional coordinator, national project coordinators, national project managers, and the national partner institutes. Fortunately, the project team is working in all countries with highly motivated and enthusiastic partners that are trying hard to make the project a success and also to reach success on conservation agriculture in the region.

Some issues deserve special attention in 2011 and 2012:

- Ensuring data collection and quality, in particular data necessary for economic evaluation of interventions
- Strengthening activities on conservation agriculture with main emphasis on crop rotation
- Organization of field days, field and formal trainings with a range of stakeholders
- Producing training material for successful interventions
- Training of students working in the project

E. REPORTS

Dr. A. Nurbekov is reporting timely on all project activities and communicated routinely with FAO (Drs. T. Friedrich, and Hafiz Muminjanov) on implementation of Project activities including financial issues. MoA of Azerbaijan, Kazakhstan and Uzbekistan were represented by Drs. Asad Musaev, Dossymbek Siddiq and Zokhidjon Ziyadullaev respectively with whom communications have taken place on a daily basis.

Annex 1. Crop rotation in the project demo sites in Azerbaijan

	Ehtibar Djumshudov																							
	2011											2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Winter wheat 4 ha				Maize			Field pea						Sunflower								Winter wheat		
	Ahmad Ibragimov																							
	2011											2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Winter wheat 8 ha				Pearl millet					Winter barley								Maize for grain				Winter wheat		
	Mehmon Babaev																							
	2011											2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Cotton 4 ha									winter wheat									Maize for silage			Winter wheat		
2	Winter wheat 4 ha				Soy bean					Winter wheat									Maize for grain			winter wheat		

Annex 2. Crop rotation in the project demo sites in Kazakhstan

	Babakhojaev Avazkhon																							
	2011										2012													
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	Winter wheat 4 ha				Kidney bean 4 ha			winter wheat										Mung bean				Winter wheat		
	Yusufjonov Gafurjon																							
	2011										2012													
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Winter wheat + alfalfa 2 ha				1 year alfalfa						2 year alfalfa													
2	winter barley 3 ha				maize			winter rye+field pea							maize						winter wheat			
	Sattorkhonov Musakhon																							
	2011										2012													
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Winter wheat 5 ha				Mung bean			Winter wheat														winter wheat		

Annex 3. Crop rotation in the project demo sites in Uzbekistan

	Meyliev Sayli																						
	2011										2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Corn, 6 ha							Winter wheat										Mung bean				Rape	
	Kholov Sobir																						
	2011										2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Soy bean, 4 ra							winter wheat										corn				field pea	
	Farm Ismatova Farangiz Azamatovna																						
	2011										2012												
	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mai		Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Cotton, 5 ha								Winter wheat									Bersim (*Trifolium*)				Winter wheat	
	Winter wheat, 5 ha				Mungbean/corn				Winter wheat														

Annex 4 – Project Photos

Pictures 1 and 2 No-till maize in Azerbaijan

Picture 3 Bed planted kidney bean in Kazakhstan

Picture 4 Locally made bed planter

Pictures 5 and 6 Winter wheat planting with no-till drill

Pictures 7 and 8 FAO evaluation mission to Azerbaijan and Kazakhstan

Annex 5 Work plan and time frame of the activities

Outputs/Activities	2011												2012												2013		
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	A	S	O	N	D	J	F	M
Output 1.1. . Improved crop production and management through accelerated adoption of conservation agricultural practices																										
Activity 1.1.1: Award contracts to ICARDA and local consultants and establish project office at ICARDA, Tashkent office																										
Activity 1.1.2: Engage local scientists for monitoring agricultural and economic parameters of the demonstrations																										
Activity 1.1.3: Organize an inception workshop to discuss the detailed national and regional work plans																										
Activity 1.1.4: Select the demonstration sites in each country and identify in a participatory manner the participating farmers																										
Activity 1.1.5: Order required equipment, spare parts, seeds, herbicides and fertilizers																										
Activity 1.1.6: Modify existing machinery/equipment for the use under CA system																										
Output 1.2. Raised-bed planter and land levelling technology adjusted and applied and lower and more efficient water utilization for the crop rotations introduced, as compared to traditional cropping systems																										
Activity 1.2.1 Carry out soil analysis in the selected farms																										
Activity 1.2.2: Survey the selected farms																										
Activity 1.2.3: supervise improved land preparation and direct seeding																										
Activity 1.2.4: Training workshops on improved water, land and crop management																										
Output 1.3: **Crop rotations diversified with crops suitable for CA**																										
Activity 1.3.1. Carry out monthly on-farm training on water and crop management																										

Activity 1.3.2. Carry out bimonthly field days during each cropping season in each country																											
Output 1.4 Confidence of farmers, extensionists and other stakeholders on practicing principles of CA increased.																											
Activity 1.4.1: Monitor growing conditions of crops on selected farms (demonstration and control plots)																											
Activity 1.4.2: Economic analysis of production cost of introduced CA technology.																											
Output 1.5 Farmer-oriented brochures and guidelines on applying CA practices in irrigated and rainfed areas in the selected countries produced and printed.																											
Activity 1.5.1: Preparation of draft guidelines on improved land, water and crop management through CA technology.																											
Output 1.6 Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners																											
Activity 1.6.1 Organize at least one quarterly field day during the cropping season on each demonstration field in each country.																											
Activity 1.6.2: Organize one final assessment workshop in each country to disseminate project's results with participation of all stakeholders and related civil societies.																											
Design zero till drill in Uzbekistan																											
Inception report																											
Final evaluation																											
Final workshop																											
Prepare publications																											
Final report																											