Akbota Public Foundation
Community-Based Adaptation (CBA) Project Proposal for UNDP/GEF SGP

PROPOSAL SUMMARY

Project Title:	Adaptation of farmers' agricultural practices in response to intensified climate aridization in Akmola Oblast.
Project Site:	Arnasai Village, Arshalyn District, Akmola Oblast, Kazakhstan
Proponent:	Akbota Public Foundation, location: Arnasai Village, Arshalyn District, Akmola Oblast, Kazakhstan Tel./fax: 8(716)44 25839 E-mail: ak_bota@mail.ru
Project Objective:	Demonstration of new agricultural practices enabling to mitigate the risks of reduced water supply levels and benefits from the climate changes in winter period.
Authorized Representative:	**Nemtsan Tatyana, Project Manager, Akbota PF** 8-701 5526711
Cooperating Organizations:	Kisar Limited Liability Partnership, farms of Arshalyk Districts, Su-Arnasy RSE CIMMYT
Start-up Date:	25.03.09
Project Period:	24 months
Total Project Cost:	$102 067
Amount Requested	$48,467
Local Input:	$10,000
Other Inputs:	
Kaisar LLP	**$32,607**
Vyachelavskaya High School	**$1,000**
CIMMYT	**$5,600**

Project Brief:

The project will be implemented by Akbota PF in Arnasai Village, Arshalyn District, Akmola Oblast located 50km from Astana City, southeast direction, on the bank of the Ishim River, in direct proximity to Astana Water Reservoir.

The project will involve the farmers and rural producers, members of the local and neighboring communities (2100 persons). The main activities of rural entities and farms whose performance improvement will be the project's focus are the production of hard wheat varieties, potato and vegetable on the irrigated fields (1200ha – irrigated lands).

Arnasai Village is supplied with summer irrigation that enables the local community to actively maintain home gardens making a considerable part of income.

In 1998 Kaisar LLP was established on the basis of Vyacheslavsky Rural Production Cooperative that was involved in 2003 in the project "Reconstruction of Irrigated and Drain Systems Covering 1170ha" funded by International bank for Reconstruction and Development and Ministry of Agriculture under GoK's guarantee. The project restored the irrigated lands and reestablished the crops that can be grown under irrigation conditions only (potato, vegetables, fodder) in the crop rotation system.

Arnasai Village is located in direct proximity to Astana Water Reservoir, which is designated mainly for drinking water supply to Astana City. According to Astana Organization which control the base degree of water level in Astana Reservoir, this organization control the water level has considerably dropped within the recent 5 years. So, the recent registered volumes range between 180-200 million cubic meters as compared to the normal volume of 405-410 million.

In **Kaisar LLP** in 2002 was realized the project envisaged the organization of 15 circular irrigation sprinklers, model "Kuban-LK" for planting of potatoes and vegetables, sterns. One of the main principal defects of this system is overexpenditure of water in the time of irrigation,

But they have a considerable design shortage: sprinkling is 1.5-2 meters elevated from the soil and causes high (up to 30%) evaporation (especially in recent years of hot summer with continuous wind) of the irrigation water and gross offset of water sprays and thus uneven irrigation of crops.

Under the existing conditions there is a problem of using water from Astana Water Reservoir in the local irrigation of Arnasai Village inhabitants for their home gardens as well as water supply to the irrigated fields of agricultural producers and farmers operating in Arshalyn District.

The project will demonstrate the alternative water-saving irrigation technologies (drip irrigation and the use of special water-saving nozzles on sprinklers).

In recent years the agricultural communities show growing concerns about the climate changes. We see that summer months get more hot and dry; winter becomes mild; spring period is characterized by frosts with minimal precipitation and low temperature that delay early growth of weeds; and autumn becomes more acceptable for farming operations, especially for the cultivation of winter crops.

Summer precipitation is effective only when the level exceeds 15mm/day. So, the main reserve of soil moisture is made by the precipitation of cold seasons that is efficiently used by the farmers and agricultural producers when dealing with the spring crops.

The highest effect for vegetation is made by the snow precipitation in winter and early spring connected with the minimal evaporation and gradual more rational accumulation of soil moisture.

In recent years the territory is reported to show the continuous reduction of summer precipitation thus leading to low crop yields and decline in agricultural crops production.

We observe, that last 5 years winter average temperatures are changed too. This information was presented by regional meteoservice.

months	2004	2005	2006	2007	2008
December	-20	-21	-16,5	-16	-12
January	-22	-25	-18	-17	-15
February	-18	-18	-14	-13	-10

This chat demonstrates the abatement of temperature our region in winter. The main snowing days are in the end of December, in the second part of January and above 15-17 days in February. This snow allows to accumulate necessary water for early winter crops.

In this regard, the selection of optimal moisture-saving arrangement and its rational use are the most pressing tasks (according to the local farmers and agricultural producers).

In view of the new and more resilient varieties for these risky land-farming areas, the crop rotation system may be added by some winter cereal crops (wheat, barley, rye) that will enable to facilitate the sowing and harvesting campaigns and produce stable crop yields even in dry years.

We also assume to demonstrate the features of winter crops cultivation under the risky land-farming conditions of Akmola Oblast (selection and research of the optimal varieties and technologies) as an opportunity of rational utilization of autumn and winter precipitation in the field operations.

Expected Outcomes and their Potential Impacts

The goal of the project is demonstration of new agricultural practices enabling to mitigate the risks of reduced water supply levels and benefits from the climate changes in winter period.

The project proposed is focused on the demonstrational activities to disseminate the farming practices enabling the local community to adapt to progressive aridization connected with the global warming and to the reduced water supply conditions; to check the environmental, economic and social viability of the transition from (1) the existing unsustainable system based on exclusively spring crops to the system that combines the production of winter wheat; (2) from the conventional irrigation technology to the water-saving technologies based on the drip irrigation; and (3) to the use of special machinery for irrigation.

To support the above-stated goal the Project will assist the local inhabitants to be actively involved in the project in as follows: (i) development of the demonstrational sites of sustainable land management such as fields under winter wheat and drip irrigation fields; (ii) technical aid to the group of agricultural producers such as procurement of special equipment for drip irrigation to be arranged on the demonstrational site; (iii) water-saving irrigation technology on vegetable fields; and (iv) public awareness campaign in the district.

The project will also contribute to the protection and improvement of environment within the district by disseminating the water and soil saving practices. In addition, it will support the most vulnerable

groups of people, contribute to the poverty alleviation and enhance the opportunities of local inhabitants to resist the draught.

The changing of precipitation level and increasing of temperatures in overlapping with old (not adapted) methods of land processing are intensify the land degradation processes. All above is strengthens by CC risks, In situation when lack of precipitation in spring time and shortage of irrigation water (again due to lack of precipitation)) in Vyacheslavka reservoir will forced the farmers do not use some of the lands. Taking into account the structure of those lands, it will be the risk of its water/wind erosion, because now the wheat is protection its from such factors. Also land with wild vegetations are not control by farmers and could suffer from steppe fires.

The project activities will enable to improve the income of village inhabitants: the winter wheat production practices, the conservancy of resources available such as lubricants, seeds, water as well as the improvement of production output of vegetables, cereals and animal fodder crops are the things that be added by the project to the labor and economic activities of local inhabitants.

The project outcomes are expected to increase incomes of the local inhabitants and raise their environmental friendliness in respect of the soil and water resources through implementing the cultivation methods of efficient winter wheat varieties, economically feasible production of vegetables and animal fodder as a result of the project activities to develop the demonstrational sites and disseminate the most efficient and tested agricultural practices.

1. Regarding the soil protection land degradation control activities, the demonstrational site needs to be developed and field days need to be organized in order to disseminate the winter wheat production practices.
2. The demonstrational site will be developed to disseminate the knowledge and skills of drip irrigation technology among the farmers, village inhabitants, schoolchildren and to train the trainers around the district.
3. To establish the demonstrational site and organize field days in order to disseminate the irrigation practices of vegetable fields using special machinery enabling to avoid the loss of water due to elevated and thus inefficient water nozzles.
4. To develop and distribute the methodological manuals dedicated to the tested winter wheat production methods, drip irrigation and the irrigation based on the low-mounted water sprayers to be installed at Kuban machines that are more accessible for the local farmers.
5. To make a project-related film with the training elements in order to share the experiences gained from the project across the area.
6. The project activities will involve 2100 inhabitants of the village and entire district.

1.0 RATIONALE

1.1. COMMUNITY/ ECOSYSTEM CONTEXT

The inhabitants of Arnasai Village counter 1100 people (225 households). People are mainly employed by various enterprises and entities and deal with home gardens practicing natural economy.

The village has a summer water supply system enabling the community to maintain the home gardens making a considerable share of income.

The local community has 5 farms, one agricultural entity (Kaisar LLP) and several organizations (Astana Su Arnasy, Astana Su, Zhasyl Aimak) supplying drinking water to Astana and establishing green belts around the capital. In addition, the village territory contains also two military units.

Most of the rural inhabitants work seasonally which is connected with the field works and production activities in spring and autumn. In addition, the local community members make income from home gardens and farming activities.

1.2 CLIMATE CONTEXT

The project site is in the risky land-farming climate zone characterized by the specific natural factors such as spring frosts, heavy winds in winter and spring, draughts in May-July, maximum precipitation level in July, early frost in autumn, limited sum of above-zero temperatures in autumn, large amount of snow in winter (40%), considerable freezing (1.5-2m) and varied mechanical structure of soils. Said factors make the basis of high erosion hazard. Every year the farmers and agricultural producers face these climate factors and weather conditions.

Key climate indices of the project site (PS):

Average minimum of January temperature rates: 22°C below zero

Average maximum of July temperature rates: 25°C above zero

Average precipitation: 300mm/year

Average number of days with the relative air humidity under 30%: 140 days. Predominant wind direction during atmospheric draughts: northern, northeastern. The dry hot winds and dust storms tend to grow. The soil cover is dominated by dark-brown soils with some black soil inclusions.

The annual seasonal precipitation is broken down as follows:

- In spring (March-April) the average normal rate is 36mm making up to 72% water, which is accumulated in the land in the moment of melting of the snow in spring
- In winter – 23mm, in autumn 51mm;
- November-February – up to 86-75%;
- In summer – 92mm, up to 57%.

The general natural peculiarities of the project site are: extreme continentality, flat woodless landscape, and strong winds.

Therefore, the first problem of agricultural production is the accumulation of moisture. According to the farmers, the priority task is not only to accumulate the moisture but also save it in reserve. To that end, water needs to be "drained" in autumn and winter to the lower soil layers, 1-2m deep, so that in the period of draught (May-June) the accumulated moisture could be used for the maximal growth of plants.

The severity and adversity of the natural-climatic conditions of the project site, extremely inadequate moisture, draughts and high air temperatures in summer, frequent drying winds that actively bring about soil erosion where summer evaporation is much higher than precipitation in vegetation period, require first of all the changes in the cultivation practices to be used in the area.

1.3. IMPACTS CONTEXT

Arnasai Village is located in direct proximity to Astana Water Reservoir mainly built for the intended purpose of supplying drinking water to Astana. According to Astana Su RSE, water volumes have considerably reduced within the recent 5 years. So, the recent registered volumes range between 180-200 million cubic meters as compared to the normal volume of 405-410 million.

In these conditions there is a problem of using water from Astana Water Reservoir for the local irrigation to maintain the home gardens of village inhabitants and irrigated fields of the farmers and agricultural producers operating in Arshalyn District.

In view of climate change impacts already experienced in the area we can observe that the average summer temperatures have lowered while autumn and winter show considerable warming. It forces farmers and local community members to rearrange the system of operations, especially in the field of farming management.

Future impacts of climate change are projected to include warming in all seasons, though with the increased warming in the winter continuing. Projections for Kazakhstan based on the national communication to the UNFCCC are summarized below:

- **Temperature rise:** According to the "medium" GHG emission scenario of Kazakhstan (P-50) the expected change of average annual temperature by 2030 will be: +1.4°C (ranging from 1.3 to 1.9°C); by 2050: +2.7°C (ranging from 2.3 to 3.5°C); by 2085: +4.6°C (ranging from 3.8 to 5.9°C).
- **Changes in precipitation and the shift of natural zones:** Rainfall isohyets are projected to move northwards by as much as 200-300km, depending on GHG emission scenario, and evapotranspiration zones are expected to move northwards by a similar amount. This will lead to increased aridity throughout the country. Also the bulk of precipitation decreases are expected to occur during the summer which is the main growing season.

The snow winter precipitation needs to be used with maximum efficiency, preserved in spring when the snow melts. On top of that, the summer months need to be used at maximum for field operations to complete all types of field works before the early frost (end of August – beginning of September) that may destroy protein and affect the quality of grain (forage instead of commodity grain) and considerable losses of the crop yield.

The main climatic risks affecting the farmers and agricultural producers are the fast snow-melting process accompanied by strong winds that may dry out the soil for a short period of time and cause its erosion as well as night' s frosts in April that affect a considerable part of crops.

Last years we observed the early snow-melting in the end of March, and the slight temperature for +12 degrees, that process determines instant snow-melting. And at nights in this time there are a lot of frosts, these processes contribute to loss of water.

Every year water inflow to Astana Water Reservoir reduces. The lowering level of average annual precipitation (200-250 mm in 2008 as compared to 300-380mm in 1998) raises the a serious problem of water supply to the irrigated fields maintained by Kaisar LLP, the main community's agricultural producer.

In addition, for about three years the village inhabitants face irrigation problems in their home gardens. Within the recent 3 years the gardens are irrigated only 3 times a week thus affecting the yields of vegetables, specifically potato, the main food product of village inhabitants.

The new more resistible varieties selected for the areas of risky land farming enabled to introduce winter cereal crops in the crop rotation (wheat, barley and rye) thus facilitating the sowing and harvesting campaigns and producing stable crop yields even in the years of dry summer.

For the time being the agricultural producers and farmers operating in the district are interested in such activities and gaining tangible results that will demonstrate the peculiarities of winter crops cultivation in Arshalyn District.

At the same time, winter crops are not so far typical of this area posing an additional risk. So, there is a need to investigate the adaptability of winter crops; to select and study a few winter varieties; to identify the optimal seeding rates; to organize workshops and field days and involve the experts, farmers, agricultural producers and representatives of administrative authorities.

1.4. PROJECT APPROACH

The existing conditions raise the problem of using water from Astana Reservoir for the local irrigation of home gardens and irrigation fields of agricultural producers and farmers.

We have studied the problem and found that some options exist to address it that enable not only to considerably save the irrigation water but also ensure the maximal effect from the proper arrangements of works.

So, e.g. in Russia the use of similar sprinklers, Kuban-LK, for irrigation is based on applying special nozzles for the near-ground irrigation whereby water is dispersed 30-50cm above the soil thus minimizing evaporation and providing the reliable and good quality irrigation in dry hot summer.

Another irrigation technique that also remedies the above disadvantages is based on the drip irrigation actively used in vegetable growing in the arid countries such as Israel and Arabic countries.

The main point of such technique is to lay a water supply hose with the holes along the row of planted crops. The holes are evenly distanced depending on the crop. The drops of water with mineral and organic fertilizers are supplied to the root.

This irrigation method avoids evaporation and saves considerable amount of water without damaging the plant due to the temperature differences between soil and water and disturbing the soil structure.

It follows from the opinion poll among the agricultural producers and farmers of Arshalyn District that the issue of using irrigation and producing vegetable and agricultural crops is relevant and farsighted since it will enable the farmers to produce guaranteed yields in the arid climate.

According to the farmers, in dry steppes it is important to apply the ‘Rule of Regulatory System of Plants’. As a rule, 20 cm of soil cover dry out in the middle of May – beginning of June. The plant needs to be forced using the moisture accumulated in deep soil strata, primarily in autumn and winter.

Winter crops are planted in August (normally on August 15-25), so the plants can get the required moisture, which is concentrated at the end of September and in October. By that time the plant will be strong and develop its root system to grow in deep soil strata. By the beginning of intensive snow melting and soil drying the plant will be ready to resist the summer draught of May an June.

Kaisar LLP is willing to be involved in the project as one of its partners and provide the irrigation sprinkler, model ”Kuban-LK”, covering 75ha to test the near-ground irrigation nozzles.

Consumption of water

Kinds of nozzles	Consumption of water
Traditional nozzelz	320 sq. m\ h
near-ground irrigation nozzles.	180 sq. m\h

Another project partner will be Vyacheslavskaya High School with its Young Farmer School functioning on a permanent basis as well as the greenhouse (63ha) and the field for vegetable crops.

The school is willing to take an active part in the project and test the drip irrigation system in its greenhouse and on the field to be compared with the existing system thus showing the village inhabitants the advantages of drip irrigation that may be arranged in their home gardens (For the time being the village has a summer water system supplying water Astana Water Reservoir on a regular basis).

Kaisar LLP will allot the land parcel of 100ha to test the plantations of winter crops, identify the variety, technology, machinery and labor to be used in all types of field operations acting as a reliable and key partner co-financing the project.

Risks and Potential Project Challenges

Climate change related problems	Impacts on the community and ecosystem	Project activities focused on the community adaptation to the climate change
1. Reduction of in supply of water from Astana Reservoir delivered to farmers due to decreased precipitation	Irrigation problems on the irrigated fields maintained by the agricultural producers; low yields of vegetable, forage crops and potato; worsening economic position of farmers and community members	- Refurbishment of the existing sprinklers with special nozzles for the near-ground irrigation to save water consumption 2-3 times and ensure high-quality irrigation at minimal cost; - The use of drip irrigation in home gardens to obtain maximal effect at minimal cost; - Training for the farmers and community members in the new technologies using minimal quantities of water and to produce the guaranteed yield in the climate change conditions;
2. The growing climate risks of farming (warm winter with maximal precipitation, early snow melting, time shift of the sowing campaign, frosts at nights in the end of March	The loss of yields under conventional sowing arrangements (the grain is planted in dry soil); the loss of interest in agricultural and farming business due to low efficiency affected by the climate risks	- To show the opportunities of cultivating winter crops on the demonstrational field (100ha) with the maximal use of autumn and winter precipitation for wheat production; - To demonstrate the selected varieties of winter crops suitable for the risky land-farming areas (domestic selection) to be replicated by the farmers and agricultural producers; - To invite the scientists and international experts to the workshop; to coordinate the project activities of selecting the optimal varieties of winter crops and technologies to be used in the climate risk conditions.

2.0 COMMUNITY OWNERSHIP

2.1 PROJECT FORMULATION

The project in question comprises the components as described below:

The community will benefit from more sustainable agricultural practices to be implemented and reduction of vulnerability to the climate change, especially connected with the growth of soil erosion. In addition, the more sustainable agricultural practices will enable maximal use of autumn and winter precipitation for winter wheat production. The best practices will be identified for replication in the neighboring communities existing in the district and oblast. The refurbishing of the irrigation sprinkler and test the special ground irrigation nozzles minimizing water consumption and maximizing irrigation effects and it will help LC to be ready to shortage of irrigation water due to CC.

The proposed approach to introduce drip irrigation as the most efficient irrigation system to be used in greenhouses and home gardens in the conditions of growing aridity and reduced water supply. and retain snow was discussed with involvement of the local community during the rural meeting and gained the full support on the part of the local inhabitants.

The changes in agro processes will compensate the risk for intensification of land degradation that would likely be driven by climate change if no action is taken.

In addition to the global environmental benefits this will bring about economic benefit for the local community.

2.2 PROJECT IMPLEMENTATION

The main Outcomes (internally funded activities to address non-climate issues)

- **Outcome 1**: **To address the basic problems of land degradation by implementing the optimal agronomical technologies**

Output 1.1. Demonstration of sustainable agricultural practices on the demonstrational sites

The Outcome will be achieved by establishing an experimental field (100ha) under winter crops capable of using maximal moisture in autumn and winter period. The demonstrational field will neighbor to the field to be planted at the end of May using the conventional technology for wheat production. Winter wheat will be planted between 15 and 25 August. Said activities will be exposed to all the required phenological observations to allow developing the necessary recommendations for the local farmers operating in the area. In addition, we suggest using the wheat seeds specifically prepared for this task (the proposed domestically selected varieties are: «Lubava», «Bajterek»)

Output 1.2. Demonstration of the use of water-saving technologies in cereals production focused on the improvement of efficient use of water resources.

Winter wheat will be planted on the demonstrational field in line with the recommendations of the specialists. It is recommended to keep in mind the surface pattern (plantations need to be made on the lands with adequate snow depositions). A special agri-landscape snow retention cartogram of will be developed for this purpose to determine winter precipitation reserve in the soil. Based on the scientific surveys, the site will be selected so that to ensure natural snow depositions, and the snow cover thickness in March should be at least 40cm.

In such fields snow-melting period starts 10-12 days later thus providing good conditions to adsorb melted waters and reduce the drainage, preventing washout of the fertile stratum and reducing the risks of soil erosion. As a result, the winter crops on such field come up well and form good shrubs!

To prepare the field for the seeding season scheduled for August 2009, a special soil treatment will be provided in spring and summer:

- 2-3-times cultivator treatment to annihilate weeds and optimize the soil density. This type of treatment will be performed by Kaisar LLP using cultivators ОПТ-8. Surface tillage and firm consistency of topsoil will enable to preserve moisture until winter cropping.

In future seeding machine СЗС-2.1 will be used for seeding winter crops in August.

According to the standard, the seeding rate is 4-5 million of germinated seeds per 1 ha or 180kg/1ha. This will enable to estimate the quantity of seeding material to be procured.

In addition, Kaisar LLP will provide the phosphoric fertilizer treatment (60kg/1ha) to ensure the efficient growth of plants.

In early spring the plantation will be fed with nitrogen fertilizers (in April, before the soil treatment operations).

The results will be summarized and presented at the workshops for agricultural producers and farmers operating in the district. In addition, a special methodological manual will be published and distributed among the workshop participants.

- **Outcome 2: To train the local community in the methods of more efficient use of water-saving practices**

Output 2.1: The local community members have the capacities of using water-saving techniques.

- Awareness and training Program

To achieve the task the project is planning to organize 4 training workshops per year with involvement of at least 40 participants representing various groups: village inhabitants, young people, senior schoolchildren of the local and other communities, teachers, district NGO's, farmers and agricultural producers, and district authorities. At the workshops the members of local and neighboring communities will be provided information and training in using water-saving techniques. Various specialists will be invited to the workshops to act as moderators: scientific experts working on the winter crops cultivation, people from the Agricultural University specialized in drip irrigation, the researchers who will explain to the inhabitants in simple terms the assumed climatic risks of rapid climate warming. In addition, the sociological polls will be organized as part of the workshops to prepare the vulnerability reduction assessment (VRA) of the target group focused by the project.

- Establishment of the community-based coordination team

To date the community-based coordination team has been set. Its members are inhabitants of Arnasai Village. The team is composed of 25 persons including:

Gender structure:	
Women:	60%
Ethnic structure:	

Kazakhs:	30%
Other ethnic groups:	%70%
Age structure:	
20-30	15%
30-40	35%
People over 40	50%
Education:	
Higher education:	80%
Vocational school:	10%
High school:	10%
Current schoolchildren and students	-

- Drafting the plan and signing agreements between the community members, partners on the rational use of project sites, water resources to secure the rational use of natural resources and prevention of degradation processes.

Akbota PF has provisionally negotiated with the assumed partners: Kaisar LLP, Gutyar Farm, CIMMYT (International Center for Conservation and Improvement of Wheat and Corn), Arnasy Su RSE, Vyacheslavskaya High School who were actively involved in discussing and writing the project concept, formulating the project proposals and agreed to participate in the project implementation as partners and share the project costs. In addition, the concept was discussed at the session of Arshalyn District Administrative Council attended by District Akim M. Marzhikpayev. Arshalyn District Department for Agriculture was ordered to provide all kind of support to the project implementation, involvement of district farmers and agricultural producers in the training workshops.

In February 2009 the general meeting of village inhabitants is scheduled in Arnasai Village where the project concept and the main steps of the project implementation will be presented. The project may be assumed to help the community in learning and applying the rational practices of natural resources utilization and prevention of degradation.

CBA Outcomes (CBA-funded activities directly mitigating the climate change impacts)

Outcome 3: The Local community members have capacities of applying water-saving methods

Output 3.1. The community capable of implementing the climatically sustainable agricultural practices

For the purpose of this Output the project plan provides for as follows:

– The training to improve the field irrigation practices (in the context of the growing aridization) focused on:

- Agricultural producers and farmers;
- Community members, households of the neighboring villages (Volgodonovka, Mikhailovka, Babatai);
- Youth of the local and other communities existing in the district (members of the youth production teams and their leaders).

We are planning to organize 9 3-days' training workshops for each group of participants dedicated to the inceptive, interim and final stages of the project implementation. Each workshop will be designed for up to 40 participants. 3 workshops are intended to establish some continuity in the process of understanding the vulnerability of focus-groups in front of the ongoing climate changes; to elaborate the mechanisms of mitigating the risks of climate change and build a sustainable adaptation of various focus-groups to the climate changes as well as adaptability and rearrangement of economic and political visioning of the anticipated problems.

We believe that one of the priority tasks of the workshops in respect of the focus groups will be to encourage the community's capacities and willingness to support the follow up activities after the project and to proceed with the adaptation process outside of the grant support.

Output 3.2. To make a short professional video film about climate change impacts in the region, and the best practices and agricultural methods of production of winter crops, different kinds of irrigations in adaptation gained from the project implementation

A professional cameraman and other specialists will be involved in this process. The specialists should be able to prepare the required material that would be not the description of the project implementation but will also reflect all the necessary process, agronomic and technical features of the winter crops seeding process, the drip irrigation technology, the

use of special nozzles in order to establish an optimal irrigation mode and save water when using the irrigation sprinklers Kuban-LK.

This film will present realization of the projects in all stages that will be able to analyze realizations of all outcomes in all period of our work with the farmers and rural producers, members of the local and neighboring communities.

The most important part of this film will be practical comments of specialists who will be consult our work and will take part in seminaries as moderators and will present technological and practical differences.

The film will reflect the project implementation process and enable the farmers and agricultural producers to use the project technologies as practical recommendations as far as the film will not only show the project chronology but also contain the practical recommendations of the workshop moderators as well as the relevant best practices.

Output 3.3. To prepare the manual for farmers, agronomical services and agricultural companies that would advocate and disseminate the practical experience to implement the climatically adaptive agricultural approaches including production of winter crops

The proponent has experience in similar work, therefore, all materials prepared during the project and the data will be summarized and presented in the methodological manual that will serve the logical attachment to the professional film.

It follows from the public polling of farmers and agricultural producers of Arshalyn District that there is a practical need in summarizing the work. The manual will be distributed at the final workshop for the farmers and through the District Agricultural Department for further circulation among the farmers of the neighboring districts.

The manual will present not only the information about agri-landscape features of winter cereals production, peculiarities of moisture accumulation under the climate changes conditions to ensure the most efficient use of the autumn and winter precipitation. It will also provide the farmers with the practical recommendations concerning technology, selection of equipment, seed varieties, optimal seeding time, he use of feeding elements.

The partners to this project (Kaisar LLP, Gutyar Farm) will also have direct benefits from the project since the experts will be involved in the project during the workshops (agronomist, team leaders, machine operators) who will be able to test the technologies under direct supervision of the scientists and international experts.

Outcome 4. **To use the alternative irrigation opportunities and the new technologies of cereals cultivation that ensure considerable saving of water resources**

Output 4.1. To exercise more efficient methods of using summer irrigation technologies designed for the cultivation of vegetables; re-equipment of irrigation sprinklers Kuban LK

To accomplish the task the special ground irrigation nozzles will be applied to the existing irrigation sprinklers (Kuban LK) to disperse water 30-50cm above the ground. This will minimize evaporation, ensure the reliable irrigation in dry hot summer. This technique to be practiced on one of the 15 existing sprinklers will demonstrate the opportunities of economical water consumption at minimal cost. To this end in mind, we are planning to procure a set of ground irrigation nozzles for the irrigation sprinkler (Kuban LK). We will also demonstrate through the comparative analysis of 2 sprinklers the opportunities and advantages of this irrigation technology for the agricultural irrigation.

The work will be of phenological and comparative nature; the data will be summarized in the manual which will be distributed at the final workshops. This will enable Kaisar LLP to remove the technological barriers of full transition to the new irrigation technology.

Output 4.2. To test the system of drip irrigation designed for the local gardening

Another irrigation technique assuming economical water consumption is the drip irrigation which is widely used in vegetable growing in the arid countries such as Israel and Arabic countries.

The main point of such technique is to lay a water supply hose with the holes along the row of planted crops. The holes are evenly distanced depending on the crop. The drops of water with mineral and organic fertilizers are supplied to the root.

This irrigation method minimizes evaporation and saves considerable amount of water without damaging the plant due to the temperature differences between soil and water and disturbing the soil structure.

The use of this technology on the demonstrational pre-school field will show the schoolchildren, their parents, members of the youth production teams of the other schools

existing in the district, representatives of other NGO's the features and advantages of this method. The method to be used on the experimental land parcels near the school and the school greenhouse will demonstrate the opportunities of efficient water consumption when cultivating various crops.

We will invite the specialists through Israel Embassy (based on the tentative arrangements) to the workshops to be organized for this group of participants to show the films, demonstrate the agri-technical methods based on such technology. All said activities will enable to organize the efficient local gardening, reduce the risks when reducing the pressure in the irrigation system.

Output 4.3. To test possibility of growing of winter crops on the fields of farmers of our society

It follows from the scientific studies that the soil moisture reaching at least 120-150mm doubles the crop yield. These figures raise special interest among the farmers and agricultural producers to cereals production with the maximal conservation of moisture in autumn and winter.

When testing the technology in question we need to take into account that the absorption of snow-melt water depends upon the main soil treatment technique, specifically, it is well-known that the most efficient absorption is ensured by deep soil tillage.

On the background of the climate change early spring becomes typical of the project site with intensive snow melting and maximal moisture weathering. So, the task will require the activities as described below:

- Efficient weed control in the 'white strand' phase. It assumes the procurement of adequate amount of contact herbicides to prepare the land for the field operations;
- Procurement of nitrogen and phosphorous fertilizers; fertilizer treatment of soil: nitrogen fertilizers – in May, phosphorous fertilizers – in August before the seeding operations;
- Procurement of winter crop seeds from the East-Kazakhstan Experimental Station adapted to the North Kazakhstan areas of risky land-farming;
- For the purpose of phenological observations as part of monitoring and preparation of the printed manual the portable leaf diagnosis equipment needs to be procured for the comparative analysis.

All the recommendations, agri-technical activities as well as the use of the most efficient varieties will enable to accomplish this type of works within the optimal time and on the highest quality level and to demonstrate the advantages of the technology on the background of the climate change.

2.3. PHASE-OUT MECHANISM, SUSTAINABILITY

One of the ways to increasing risks, adaptation of rural inhabitants to the climate changes and sustainable development of the local community may be the use of the most efficient irrigation systems that ensure considerable water saving and protection of soil from degradation and the use of the agricultural crops that may optimally consume moisture in autumn and winter.

We believe that such approach will considerably reduce the environmental, economic and social risks.

2.3.1. The global environmental benefits (GEB) will result from implementing the Operational Program to Combat the Land Degradation.

2.3.2. GEB will be attained from the planned project activities through the use of the rational irrigation systems, sustainable soil treatment, the rational use of precipitation moisture accumulated in autumn and winter. Below is the list of GEB indicators to be used for said purposes:

- The area of land (ha) under sustainable management implemented by the project
- The farmers income(US$) from agricultural products produced by the project - number of families benefited from project
- The number of project-developed/ implemented innovations or new technologies
- The number of implemented methods/ approaches focused on the reduction of the climate-change risks and incorporated as part of the activities on the natural resources sustainable management
- The number of participants (households) benefiting from the activities of sustainable resources management (increased income of selected 5 households to be monitored)
- The number of tested approaches to the sustainable natural resources management to improve the livelihoods of local inhabitants and protect water resources.

2.3.3. The project is expected to address the basic problems related to the adaptation to the local climate change faced by the community such as:

1. **The Baseline Problems**

- *Reduction of spring and summer precipitation, reduction of the crop yields*

Winter crops are not typical of the is area, so, there is a need to study the adaptation of winter crops, select and survey a few varieties, determine the optimal seeding rates, organize the workshops, field days to be attended by the specialists, farmers, agricultural producers, administrative authorities. The activities should be tailored to the risky land-farming conditions. For the time being the agricultural producers and farmers operating in the district are interested in such work and gaining the outcomes that would enable to show the peculiarities of *winter crops* cultivation in Arshalyn District.

This project is believed to restructure the perception of farmers and agricultural producers and change their understanding of the content of agricultural works towards economic and environmental benefits.

- *Considerable drop of water level in Astana Water Reservoir*

In the existing situation there is a problem of water consumption from Astana Reservoir for the irrigation of local gardens maintained by the local community.

The drip irrigation technology will minimize evaporation and considerably save water resources without damaging plants by temperature differences of water and soil and disturbing the soil structure.

The use of special ground irrigation nozzles for the irrigated fields is an optimal option.

We believe that refurbishment of the existing irrigation sprinklers Kuban LK with similar nozzles would considerably reduce water consumption, protect soil from degradation and thus enable to efficiently use the automated irrigation system with minimal water consumption.

2.3.4. The climate change affects the ecosystem of the project site: frequent dry years, dramatic reduction of spring and summer precipitation, the drop of water level in Ishim and Astana Water Reservoir.

The previous year has shown that the local processors, farmers and local community are not prepared for the climate change processes.

So, following the harvesting campaign the average crop yield of cereals in Arshalyn District was 6.5 hw/ha. Scanty precipitation in winter, dry spring and hot summer affected the expected crop yield on the background of increased costs of lubricants, herbicides, seeds etc.

In addition, the irrigation of home gardens maintained by the local community was late (started at the end of June) thus affecting the household crop yields. The main problem is the lack of water in Astana Reservoir.

All the above factors directly threaten the LC's well-being, farming development and vegetable growing in the region.

Training for the local inhabitants in the methods of drip irrigation: public awareness of expected risks related to the climate change and development of mechanisms of conscious surpassing the future problems will enable the members of the local and neighboring communities to rearrange their household gardening economy, get ready for the future risks of limited water supply and gain maximal benefits.

3. PROPONENT DESCRIPTION

3.1. Akbota Public Foundation was established in 2003 on the basis of Vyacheslavskaya High School.

The Proponent's mission is to coordinate the local community in order to improve the social and environmental situation in the village; to support innovation processes in order to educate the young people as active citizens and top-level professionals.

In 2005 Akbota accomplished the project «Formation of Environmental Culture of Children and other Community Members».

From 2006 to 2008 Akbota was involved in the project «Demonstration of the Alternative Soil-Protection Technology of Fallow Fields».

In addition to the project activities LC members are involved in extensive awareness activities not only among Arnasai community members but also among the inhabitants of neighboring villages in order to explain the new elements of water and land resources management mitigating the climate change risks.

To date Akbota has accomplished 12 projects addressing the social situation within the local community.

The proponent uses many-sided approaches based on the local, district, oblast, national and international level. Akbota is the member of International Socially Active Foundations Association.

Its main focus is on the use and implementation of innovative, simple and efficient technologies that would improve awareness of the local and neighboring communities, involve partners, experts and scientists to train the local inhabitants in maintaining sustainable work on the background of the ongoing changes of external and internal factors.

3.2. Akbota has experience in the field of adaptation to and mitigation of the risks of climate change as well as capacity building in various aspects:

- Workshops and surveys of all drinking water sources of the local community; restoration of natural sources, protection and environmental control;

- Implementation of the project to implement the soil protection technology; post-project follow-up support to the district agricultural entities to disseminate the technology;

- Akbota acts as the regional resource center to support and develop the local NGO's and initiative groups in order to address the environmental and social problems faced by the local and neighboring communities;

- Support and development of the youth initiative and training in soil protection agricultural technologies provided at Young Farmer School operating within Akbota;

- Establishment and active work of the Press Center and Video Center «ShiK» showing active civil position and capable of making the required items for the workshops, training, campaign organized for the local ad neighboring communities.

3.3. The Role in the Project:

- To draft the project proposal
- To ensure overall project coordination
- To test the irrigation technologies using the ground irrigation nozzles and drip irrigation;
- To test the technology and varieties when dealing with winter crops cultivation
- Methodological support for public awareness and community mobilization
- Involvement all the parties related
- Removal of the risks emerging throughout the project
- Information support
- Experience sharing
- Active dissemination of experience among the neighboring communities
- Financial and theoretical progress reporting before the grantor and community.

3.4. At the meeting attended by over 100 persons representing Kaisar LLP, Astana Su RSE, Zhasyl Aimak RSE, 2 farms, teaching staff and local inhabitants it was decided to develop the Project Concept. The participants discussed the project objective, outcomes and outputs.

All participants took an active part in drafting the Concept Paper. Tatyana Nemtsan was in one vote elected to a position of Project Manager and chief project executive responsible for the project activities.

The community members were informed at the village meeting. They have approved the Project Concept and agreed to implement the project activities.

In addition, at the meeting held in Kaisar LLP it was decided to act as a partner to Akbota for the project and provide the required lands (both irrigated and rain-fed) and to become the project stakeholder.

The preliminary negotiations have been held with International Center for Wheat and Corn Conservation (CIMMYT) concerning their partnership to the project. Similar negotiations were held with Astana University of Agriculture and Head of Laboratory for Agricultural Technoloies V. Shvidchenko who agreed to act as the consultants for the training workshops.

The rural community and its leader Tatyana Nemtsan have shown the initiative in drafting this Concept Paper. The preliminary arrangements have been made in Arnasai Village to find the related partners; the necessary support was obtained from the village and district akims, agricultural processors and farmers; and the information was collected for the Project Concept.

3.5. Akbota PF has a lot of experience in developing and implementing the projects funded by foreign and national donors.

The recent projects (2006-2008) are listed below:

1 Demonstration of Alternative Soil Protection Technology of Fallow Field sponsored by SGP GEF/ 2006-2008

2. The Influence of Natural Drinking Sources on Human Health; Protection and Environmental Control funded by the World bank for Reconstruction and Development/ 2006

3. Healthy Society Program sponsored by Japanese Government; Grass Roots Program/ 2008

4. Formation of Healthy and Environmental Society sponsored by Foundation of the First RK President – 2008.

3.6. The annual budget is about $50,000. The main sources of funding are the grants of international and national development programs.

4. OBJECTIVE, OUTCOMES, PLANNED OUTPUTS

Outcome 1: To address the baseline problems of land degradation by implementing the optimal agronomical technologies:	
Output 1.1	*1.1. Demonstration of sustainable agricultural practices on the demonstrational sites*
Output 1.2	*1.2. Demonstration of the use of water-saving technologies in cereals production*

	focused on the improvement of efficient use of water resources.
Outcome 2: To train the local community in the methods of more efficient use of water-saving practices	
Output 2.1	2.1 The local community members have the capacities of using water-saving techniques
Outcome 3. The Local community members have capacities of applying water-saving methods	
Output 3.1	*The community capable of implementing climatically sustainable agricultural practices*
Output 3. 2	*To make a short professional video film about climate change impacts in the region, and the best practices in adaptation gained from the project implementation*
Output 3. 3	*To prepare the manual for farmers, agronomical services and agricultural companies that would advocate and disseminate the practical experience to implement the climatically adaptive agricultural approaches including production of winter crops*
Outcome 4. To use the alternative irrigation opportunities and the new technologies of cereals cultivation that ensure considerable saving of water resources	
Output 4.1	*To exercise more efficient methods of using summer irrigation technologies designed for the cultivation of vegetables; re-equipment of irrigation sprinklers Kuban LK*
Output 4.2	*To test the system of drip irrigation designed for the local gardening*
Output 4.3	*To test possibility of growing of winter crops on the fields of farmers of our society*

4.2. Timetable

	a	m	j	j	a	s	o	n	d	j	f	m	a	m	j	j	a	s	o	n	d	j	f	m
Outcome 1																								
Output 1.1																								
Output 1.2																								
Outcome 2																								
Output 2.1																								
Outcome 3																								
Output 3.1																								
Output 3.2																								
Output 3.3																								
Outcome 4																								
Output 4. 1																								
Output 4. 2																								

Output 4.3																							

4.3 Risks and Barriers

BARRIERS	MEASURES TO ADDRESS
Misunderstanding of the local authorities	Involvement of the personnel from Department for Agriculture, district and village akims in the project development, reviews, training workshops and field days
Mistrust of people	Explanatory work concerning the project objectives, the advantages of drip irrigation development in the village; demonstration of the irrigation differences to the workshop participants
Technological constraints when organizing field works to cultivate winter crops	Consultations of international experts under Farmer-to-Farmer Program; their involvement in th workshops for the district farmers and agricultural processors
Weather conditions	Adherence to the agri-technical normative rates, insurance of plantations

To prevent Risk 1 the Proponent suggests active work on all levels throughout the project: workshops, high-quality handouts explaining in simple terms the advantages of the proposed technologies to the local and neighboring community members.

Akbota PF has a good repute not only in the village but also on the district and oblast levels. In addition, we are supported by the local farmers, agricultural processors and Arshalyn District Authorities.

To address Risk 2 we propose to involve the youth and parents to the experimental field-testing of drip irrigation. In addition, we will enable the youth creative group to study the peculiarities of the priority use of drip irrigation as compared to the conventional irrigation.

In view of the problems of timely irrigation arrangements in spring for home gardens we are planning the workshops in May (the period of maximal draught) thus enabling the local inhabitants to make sure of the advantages of drip irrigation by example. In addition, the international farming specialists to be involved under CIMMYT arrangement will make the village inhabitants aware of the advanced methods of economical water consumption with maximal yield.

To address Risk 3 we are planning to involve the international specialists of Farmer-to-Farmer Association in the field works to be able to involve them in the workshops, make the local farmers aware of the main world achievements in the field of winter crops cultivation in the risky land-farming areas, and provide assistance in selecting the optimal seed varieties of winter wheat.

We believe that timely phenological observations, the arrangement of consultations with scientists and practical experts, the use of the latest achievements in adhering the agricultural technologies will reduce the risk connected with the changeable weather conditions.

4.4 MONITORING AND EVALUATION PLAN

Adaptive Capacity

4.4.1. Initial VRA Analysis

The seminar in Arnasai Village held on 31.01.2009 was attended by 225 persons including () men and () women. The issues discussed by the participants are listed below:

1. Vulnerability of livelihoods to the current climate change and/or climate variability
2. Vulnerability of livelihoods to the oncoming climate change risks
3. The height of barriers (institutional, technological, financial) to adaptation
4. Capability and capacities of the local community to follow up the adaptation process after the project.

VRA H-forms are provided in Exhibit 2.

VRA results are provided in the table below

Vulnerability Reduction Assessment Reporting Form	
Indicator 1	1.64
Indicator 2	2.44
Indicator 3	2.8
Indicator 4	2.12
Average	2.25

GEB will be measured by the area of winter crops cultivated by the farmers of Arnasai Village and agricultural entities of Akmola Oblast. In addition, the volumes of water consumption will be analyzed along with the efficiency of drip irrigation as compared to the conventional technology. These will be the indicators of project activities and implementation of the methods of sustainable LC development. The Impact Assessment System (IAS) will measure the final project outputs based on the indicators as follows.

UNDP Adaptation Indicators

- Risk mitigation for the farmers and agricultural processors enabling them to widely implement winter crops in their crop rotation, especially on the background of the climate change; to use with maximum efficiency winter and spring precipitation; to stabilize the farming operations creating additional jobs in summer period;
- The use of ground irrigation nozzles in Kaisar LLP covering 1170 ha to enable efficient irrigation considerably reducing the potential of soil washout;
- Implementation of the drip irrigation system in home gardens maintained by the rural community,
- Expansion of the fields under winter crops maintained by the farms and agricultural producers of Arshalyn District.

The project implementation will be measured by the indicators as follows:

- Dynamics of potato yield on the field irrigated using the ground irrigation nozzles as compared to the conventional irrigation (Kuban LK);
- Changes in the soil mechanical structure; the use of drip irrigation by the local community as the most efficient form of irrigation contributing to the stable crop yields with minimal water consumption;
- Crop yield dynamics of winter crops to be compared to the different varieties and the wheat produced by the conventional dry-land technology.

Said indicators will be analyzed on the background of meteorological data obtained from the nearest meteorological station.

In addition, the project will prepare a special film to enable the inceptive, interim and final evaluation of the project results. We also propose the independent assessment methodology to be used by the local community to be supported by the independent video monitoring of the progress.

4.5 Project Management

4.5.1 Tatyana Nemtsan, the project manager of Akbota PF, wil be responsible for the project implementation.

Ms. Nemtsan has a university degree of State Pedagogical Institute named after S. Seifullin. She has a good experience (since 2003) in the project management of environmental projects implemented by the local and neighboring communities.

She is well knowledgeable of the problems faced by the local community and has close liaison with the farmers and agricultural producers operating in Arnasai and other villages. She was directly involved in building the close relationships with the project stakeholders, Kaisar LLP, CIMMYT, Zhasyl Aimak RSE, Astana-Su Arnasy. Therefore she is a suitable nominee for the project management position.

Tatyana has an extensive experience in organizing volunteer activities involving the young and adult members of the community. She has gained the standing of the professional project manager in Akmola Oblast.

This Project Concept was discussed at the open meeting of village inhabitants and presented for review to Arshalyn District Akimat. The project proposals were approved and supported by the district government.

Ms. Nemtsan will present the quarterly progress reports to Stanislav Kim, SGP GEF Coordinator in order to ensure the continuous control of the project activities.

4.5.2 Relationship and Responsibilities of Proponent and Project Partners:

The permanent project partners are the 7 legal entities. In addition, the preliminary agreement was reached at the meeting of agricultural producers and farmers of Arshalyn District concerning the involvement of agricultural entities in the training workshops. There are 12 NGO's registered in Arshalyn District that are willing to be involved in the workshops to train the inhabitants of neighboring villages in applying the drip irrigation technology.

Akbota will ensure the project management support and allocate the time of the project manager and other staff members in line with the project budget.

5.0 PROJECT COSTS AND OTHER SOURCES OF FUNDING

Total project cost:	$ 102 067
Amount requested	$ 48 467

Local Input: $ 10 000

Other sources:
Kaisar, Gutyar $ 37 000
Vyacheslavskaya School $ 1 000
CIMMYT $ 5 600

Budget Funded by CBA, Proponent, Partners

		Item (Description)	CBA Input, $	Proponent's Input, $		Partners Input, $		Total Amount, $
			In Cash	In Cash	In kind	In Cash	In Kind	
Outcome 1	**Output 1.1**	*Demonstration of sustainable agricultural practices on the demonstrational sites*						
	Activity 1.1.1	Establishing an experimental field (100ha) under winter crops				2000		2000
	Activity 1.1.2	Using the conventional technology for wheat production				2000		2000
	Activity 1.1.3	Phenological observations					1000	1000
	Output 1.2	*Demonstration of the use of water-saving technologies in cereals production focused on the improvement of efficient use of water resources*						
	Activity 1.2.1	Consultations with specialists	3500					3500
	Activity 1.2.2	Adsorb melted waters				600		600
	Activity 1.2.3	To prepare the field for the seeding				1000	1000	2000
	Activity 1.2.4	2-3-times cultivator treatment				1000	1000	2000
	Activity 1.2.5	Seeding by special machine				1000	1000	2000
	Activity 1.2.6	Providing the phosphoric fertilizer treatment					1000	1000
Outcome 2	**Output 2.1**	*Awareness and training Program*						
	Activity 2.1.1	To organize 4 training workshops per year	2900					2900
	Activity 2.1.2	To provide information and training in using water-saving techniques	1500				1000	2500
	Activity 2.1.3	To invite to the workshops moderators	1500					1500
	Activity 2.1.4	To explain to the inhabitants in simple terms the assumed climatic risks of rapid climate warming		2000				2000
	Output 2.2	*Establishment of the community-based coordination team*						

	Activity 2.2.1	Drafting the plan and signing agreements between the community members		2000				2000
	Activity 2.2.2	To discussing at the session of Arshalyn District Administrative Council attended by District Akim M. Marzhikpayev						
Outcome 3	**Output 3.1**	*The community capable of implementing the climatically sustainable agricultural practices*						
	Activity 3.1.1	The trainings for agricultural producers and farmers	2000					2000
	Activity 3.1.2	The trainings for community members, households of the neighboring villages	2000	500				2500
	Activity 3.1.3	The trainings for Youth of the local and other communities existing in the district	1500			1000		2500
	Output 3.2	*To make a short professional video film*						
	Activity 3.2.1	To prepare the required material	4000	1000				5000
	Activity 3.2.2	Presentation of film in final trainings		1200				1200
	Output 3.3	*To prepare the manual for farmers, agronomical services and agricultural companies*						
	Activity 3.3.1	To prepare the required material	2000	700				2700
	Activity 3.3.2	Presentation of manual in final trainings		2600				2600
Outcome 4	**Output 4.1**	*To exercise more efficient methods of using summer irrigation technologies designed for the cultivation of vegetables; re-equipment of irrigation sprinklers Kuban LK*						
	Activity 4.1.1	Accomplish the task the special ground irrigation nozzles	6000			20 000		26000
	Activity 4.1.2	Demonstrate the opportunities of economical water consumption at minimal cost						
	Activity 4.1.3	To work with phenological and comparative nature					1000	1000
	Output 4.2	*To test the system of drip irrigation designed for the local gardening*						
	Activity 4.2.1	Organize and demonstrate of this technology on the demonstrational pre-school field	5000				1000	6000
	Activity 4.2.2	To invite the specialists through Israel Embassy					1000	1000

	Output 4.3	*To test possibility of growing of winter crops on the fields of farmers of our society*						
	Activity 4.3.1	Testing the technology				1000		1000
	Activity 4.3.2	To prepare the land for the field operations				5000		5000
	Activity 4.3.3	Procurement of nitrogen and phosphorous fertilizers	4567					4567
	Activity 4.3.4	Procurement of winter crop seeds from the East-Kazakhstan Experimental Station	9000					9000
	Activity 4.3.4	Phenological observations	1000					1000
	Activity 4.3.5	To demonstrate the advantages of the technology on the background of the climate change.	2000					2000
	Total		**48467**	**10000**		**34600**	**9000**	**102067**

The budget is estimated at the current exchange rate of 1$ = KZT140

Personnel/labor: Total CBA input - 2900$
Equipment/ Materials: Total CBA input - 22567$:
Training/ Workshops/ Meetings/ Awareness/ Advocacy: Total CBA input – 13500$.
Contracts : Total CBA input - 3500$;
Banking fees: Total CBA input - 1000$.
Business Trips: Total CBA input - 3000$
Monitoring: Total CBA input - 3000$

№	Item	Total Cost	Amount from CBA	Amount from Proponent		Amount from other Partners	
			In cash	In cash	In kind	In cash	In kind
1	**A.** Personnel/ labor (local manager, account – 18 monthes)	**9900**	2900			7000	
2	**B.** Equipment /Materials (A set of nozzles, a drip irrigation, seeds, Lubricants for all types of operator works, Seeder, Soil processing equipment, Circular irrigation installation, Kuban LG Methodological literature	**60 767**	22 567		8000		30 200

3	**C.** Workshops/Meetings Payment to the workers engaged in the sprinkler refurbishment, in the field works, in cleaning and storage of seeds. Meals for the workers, Consultation services, Workshops (6 workshops X 35 participants) - Meals for workshop participants - Office supplies - Handouts (booklets, information materials) - Office rental Communications, phone calls, fax, Internet Preparation and production of professional video film, 20 minutes Remuneration for experts, consultants, moderators engaged in the workshops, with DSA and travel cost coverage Publication of methodological manual for winter crops, 70 copies Office supplies	**21 900**	13 500		2000	2000	4400
4	**D.** Contracts Consultants, experts	**3500**	3500				
5	**E.** Travel Expenses Business Trip Expenses	**3000**	3000				
6	**F**. Other Expenses Banking Fees Monitoring	**3000**	3000				
TOTAL		**102 067**	**48 467**		**10 000**	**9000**	**34 600**

Summary of Project Financing

Sources of funding	2009	2010	Total, US$
CBA-requested amount	31983	16484	48 467
Amount from Akbota PF	5000	5000	10 000
Amounts from Partners	21800	21800	43 600
Total Project Cost	**58783**	**43284**	**102067**

Input from Proponent: (in-kind)

Mini-van ГАЗ -322131195 (on an as-needed-basis) to transport the workshop participants; payment of the driving services	1000	1000	2000
Sprayer	1000	1000	2000

Video camera	600	600	1200
Digital photo camera	300	300	600
LSD projector with screen	1000	1000	2000
Computers	800	800	1600
Scanner	100	100	200
Printer	200	200	400
TOTAL	**5000**	**5000**	**10 000**

Inputs from Partners:
Kaisar LLP, Gutyar Farm (in kind, in cash)

Soil processing equipment, model ЛДГ-10	1000	1000	2000
Seeder, model СЗС 2,1	1000	1000	2000
Harvester, model Yenisey, tractor for seeding works, soil processing, fertilizing – to be used only in the field works	3000	3000	6000
Circular irrigation installation, Kuban LG	10 000	10 000	20 000
Payment to the workers engaged in the sprinkler refurbishment	1000	1000	2000
Payment to the workers engaged in the field works	1000	1000	2000
Payment to the workers engaged in cleaning and storage of seeds	1000	1000	2000
Meals for the workers	500	500	1000
TOTAL	18 500	18 500	37 000

Input from CIMMYT (in kind, in cash)

Invitation of drip irrigation specialist and engagement in the workshop	1000	1000	2000
Networking	500	500	1000
Consultation services	500	500	1000
Methodological literature	800	800	1600
TOTAL	2800	2800	5 600

Input from Vyacheslavskaya School (in kind)

Fax machine	100	100	200
Classroom for workshops and training	400	400	800
TOTAL	500	500	1000

Inputs from Akbota and Partners

Source of input	In kind	Made or Expected	Amount	Unit price	Value of Input
Akbota PF	Mini-van ГАЗ -322131195 (on an as-needed-basis) to transport the workshop participants; payment of the driving services	Made	1	11 200	2000

Akbota PF	Sprayer	Made	1	6000	2000
Akbota PF	Video camera	Made	1	600	1200
Akbota PF	Digital photo camera	Made	1	300	600
ОФ «Акбота»	LSD projector with screen	Made	1	1000	2000
Akbota PF	Computers	Made	1	800	1600
Akbota PF	Scanner	Made	1	100	200
Akbota PF	Printer	Made	1	200	400
Kaisar LLP	Soil processing equipment, model ЛДГ-10	Made	1	4000	2000
Kaisar LLP	Seeder, model СЗС 2,1	Made	1	4000	2000
Kaisar LLP	Harvester, model Yenisey, tractor for seeding works, soil processing, fertilizing – to be used only in the field works	Made	1	20 000	6000
Kaisar LLP	Circular irrigation installation, Kuban LG	Made	1	25 000	20 000
CIMMYT	Networking	Made	1		1000
CIMMYT	Consultation services	Made	1		1000
CIMMYT	Methodological literature	Made	1		1600
Vyacheslavskaya School	Fax machine	Made	1	200	200
Vyacheslavskaya School	Classroom for 9 workshops and training sessions	Made	1	99	800
TOTAL in-kind input					**44 600**

Source of input	In cash	Made or Expected	Amount	Unit price	Value of Input
Kaisar LLP	Payment to the workers engaged in the sprinkler refurbishment	Expected	10	200	2000

Kaisar LLP	Payment to the workers engaged in the field works	Expected	10	200	2000
Gutyar	Payment to the workers engaged in cleaning and storage of seeds	Expected	10	200	2000
Gutyar	Meals for the workers	Expected	10	100	1000
CIMMYT	Invitation of drip irrigation specialist and engagement in the workshop	Expected	1	1000	2000
TOTAL in-cash iput					**9000**

PROJECT COSTS (CBA-requesed funds)

Cost Category	Year 1 (2009)	Year 2 (2010)	Total, US$
A. Personnel/ labor	1450	1450	2900
B. Equipment /Materials	19783	2784	22567
C. Training/ Workshops/ Meetings/ Awareness/ Advocacy	6750	6750	13500
D. Contacts	2000	1500	3500
E. Other Expenses (travel and other expenses)	1500	1500	3000
F. Other Expenses	500	2500	3000
Total Project Costs	**31983**	**16784**	**48467**

DETAILED BUDGET (Funds requested from CBA)

No.	Activities	Amount requested, $
A	**Personnel/labor**	
1.	Local manager, 18 month	2000
2.	Accountant, 18 months	900
	TOTAL for A:	**2900**
B	**Equipment/ Materials**	
4.	A set of nozzles for ground irrigation	6000
6.	A drip irrigation set	5000
8.	Seeds, 100ha X 15kg x KZT250*	6000
10.	Lubricants for all types of operator works, KZT	4567
11.	Transportation (seeds, lubricants), 250km x 2 times	1000

	TOTAL for B:	**22567**
C	**Training/ Workshops/ Meetings/ Awareness/ Advocacy**	
12.	Workshops (6 workshops X 35 participants) - Meals for workshop participants - Office supplies - Handouts (booklets, information materials) - Office rental	3000
13.	Communications, phone calls, fax, Internet	500
14.	Preparation and production of professional video film, 20 minutes	4000
15.	Remuneration for experts, consultants, moderators engaged in the workshops, with DSA and travel cost coverage	3000
17.	Publication of methodological manual for winter crops, 70 copies	2000
18.	Office supplies	1000
	TOTAL for C:	**13500**
D	**Contracts**	
	Consultants, experts	3500
	TOTAL for D:	**3500**
E	**Business Trips**	
	Business Trip Expenses	3000
	Travel	
	DSA	
	Accommodation	
	TOTAL for E:	**3000**
F	**Other expences**	
19.	Banking Fees	1000
20.	Monitoring	2000
	TOTAL	**48467**

EXHIBIT 2: INITIAL VULNERABILITY REDUCTION ASSESSMENT H-FORM
FOR THE PROJECT
ADAPTATION OF FARMERS' AGRICULTURAL PRACTICES IN RESPONSE TO THE INTENSIFIED CLIMATE ARIDIZATION IN AKMOLA OBLAST

Reasons of positive answer	**How serious is the current impact of draught and reduced**	**Reasons of negative answer**

1. Problems with water supply for irrigation considerably affected the crop yields of potato and vegetables in 2006 and 2007. 2. Reduced crop yield of cereals due to the loss of water in spring. 3. Reduced rangelands for animal grazing due to the drop of precipitation in winter and spring.	**water levels in Astana Reservoir and precipitation on the agricultural production of Arnasai inhabitants?** 0 1 2 3 4 5 Average Rating -1.64 How could the rating be improved? 1. To cultivate winter crops 2. To re-equip the irrigation sprinklers with water-saving nozzles 3. To test the drip irrigation system	1. September got warmer; it is suitable for the field works. 2. People started thinking of environmental problems
Reasons of positive answer	**How serious will be the climate change impact on our livelihoods?** 0 1 2 3 4 5 Average rating -2.44 How could the rating be improved? 1. To cultivate area-specific varieties of winter crops 2. To make the farmers aware of the features of winter crops cultivation To install special nozzles on the sprinkler to ensure the rational irrigation.	**Reasons of negative answer**
1. Reduced income of farmers and agricultural producers due to low crop yields. 2. Reduced incomes due to low crop yields of potato and other vegetables. 3. Reduced cattle stock due to poor forage provision. The forage prices have doubled. 4. The area of home gardens has reduced		Opportunities of working in Astana (apart from gardening and farming)
Reasons of positive answer	**What are the barriers to disseminating the project-tested technologies: drip irrigation, winter cereals, the use of special nozzles?** 0 1 2 3 4 5 Average rating - 2.8 How could the rating be improved?	**Reasons of negative answer**
1. Lack of equipment 2. Lack of seeds 3. Lack of knowledge of using the technologies 4. Water supply problems		1. There is a summer water supply system; hopefully next year the irrigation will improve?
Reasons of positive answer	**Will the community be able to follow up without further**	**Reasons of negative answer**

1. If we see the positive result 2. If we learn the technology 3. If the seeds are available	**financial support?** 0 1 2 3 4 5 Average rating – 2.12 How could the rating be improved?	1. The experiment results have not met our expectations.