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CACnews

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CGIAR Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus

CGIAR Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus is being implemented in the region since 1998. The goal of the Program is to contribute to achieving the overall goal of food security, economic growth, environmental sustainability and poverty alleviation in the countries of Central Asia and the Caucasus. Its immediate objective is to assist the CAC countries in achieving sustainable increases in the productivity of crop and livestock systems through development, adoption and transfer of production technologies, natural resource management and conservation strategies, by strengthening agricultural research and fostering cooperation among the CAC countries and international agricultural research centers.

EDITORIAL

Dear Reader,

The Consultative Group on International Agricultural Research (CGIAR) has undergone a reform. A new Strategy and Results Framework will, for the first time, allow the CGIAR Centers to function as a unified system working together to pursue shared goals. All research priorities and activities will be guided by their potential contributions to these goals. The goals are:

- Reduced rural poverty
- Improved food security
- Improved nutrition and health
- Sustainably managed natural resources

The CGIAR Research Programs are the main mechanism by which the CGIAR will achieve the greater alignment with the strategic goals. In Central Asia and the Caucasus (CAC), future research will focus on "Integrated Agricultural Production Systems in Dry Areas", which is the CGIAR Research Program led by ICARDA. The new program will focus on integrated dryland farming systems, with multi-disciplinary research teams working at several benchmark sites in CAC. The program aims to develop and test new farming technologies to improve livelihoods throughout the CAC Region, and in dryland areas elsewhere. A global planning workshop was held in Nairobi, in July 2011. The participants from CAC were among those five Regions where action sites for future research were discussed and identified (read more on page 18). It is expected that the new CGIAR mechanisms will become fully operational in 2012.

In the meantime, a new project on "Sorghum and Pearl Millet for Crop Diversification for Improved Crop-Livestock Productivity and Farmers Livelihoods in Central Asia" was recently approved for funding by the Islamic Development Bank through the International Center for Biosaline Agriculture (ICBA), a member of the Regional Program. The project will be implemented closely together with ICARDA and ICRISAT. This collaborative arrangement shows how individual members of the Program can join forces and add value to the individual efforts of the Centers. The inception workshop was held in Tashkent, in June 2011 (page 9). Besides the Centers' representatives, a number of partners from the national research and farmers organizations participated, in order to share goals and develop a workplan. The main objective is to contribute to the improvement of livelihoods of farmers in salinity-affected and marginal environments in Central Asia through the development and dissemination of high-yielding, salinity-tolerant sorghum and pearl millet lines and cultivars, as well as crop management technologies for sustainable crop-livestock production systems in Tajikistan, Uzbekistan and Kazakhstan. The activities will include establishment of on-farm demonstration trials with material that already showed high yield potential. The demonstration plots will be established with full farmer participation, with particular attention to the participation of rural women. Enhancement of the productivity of forage-livestock systems in Central Asia and its impact on the livelihoods of the vulnerable rural population will be assessed. As in all our efforts, capacity building is a significant component of this new project.

Your views, feedback and contributions are very important to us. We are committed to bringing you updated information on collaborative research activities, particulary those that have an impact on reducing rural poverty and improving food and nutritional security while decreasing the environmental footprint on agriculture in Central Asia and the Caucasus.

Dr. Jozef Turok,
Head of CGIAR-CAC PFU,
ICARDA Regional Coordinator

IMPORTANT EVENTS

Prof. Murat Karabayev awarded Honorary Diploma

In April 2011 Ministry of Agriculture of the Republic of Kazakhstan awarded Prof. Murat Karabayev, CIMMYT Representative in Kazakhstan, the Honorary Diploma for the significant contribution to agriculture development in the Republic of Kazakhstan. During the awarding ceremony the tremendous role and contribution of CIMMYT in agricultural science, production, and development in Kazakhstan was emphasized.

Young Researcher from Tashkent State Agrarian University received IFAR Grant for 2011 Thalwitz Scholarship

Dr. Botir Haitov

ICARDA-CAC office in Tashkent sponsored the application from Uzbekistan for Thalwitz Memorial Scholarship 2011, managed by IFAR. IFAR annually provides small grants to professionals from national agricultural research systems (NARS) in developing countries. The main purpose of the scholarship is to enhance the development of promising professionals, who are at the early to middle stages of their careers, and undertaking research in partnership with CGIAR Centers to support sustainable development of agriculture. Applications from local researchers and scholars are submitted through Centers and evaluated by international experts and IFAD Board. The award amount is US$11,000, which included $1,000 for books, journals and equipment.

This year the Scholarship was awarded to Dr. Botir Haitov, Scientific researcher of Tashkent State Agrarian University with research project title “Identifying Genetic Variation and Effective Plant-Microbe Association for Salt Tolerance in Chickpea”, which will investigate the ways of increasing of plant yields and remediation of saline soils in Uzbekistan by using bioproducts. This project will be jointly supervised by Dr. Dilfuza Egamberdiyeva of Tashkent State Agrarian University and Dr. Ram Sharma of ICARDA-CAC.

ICARDA-CAC office in Uzbekistan congratulates Dr. Botir Haitov and wishes him all the success in his work!

FUTURE EVENTS

CGIAR Steering Committee Meeting will be held in Tashkent

Fourteenth Meeting of the Steering Committee of the Consultative Group on International Agricultural Research (CGIAR) Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus will be organized in Tashkent in the “Navoi” Conference Hall of the International Business Centre on 20-22 September 2011.

The Heads of the National Agricultural Research Systems (NARS) from Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan and Director Generals of 11 International Agricultural Research Centers or their representatives will attend the event as members of the Program Steering Committee. In addition, the partners of the Program from a number of national and international research and development agencies will join meeting sessions.

The meeting sessions will take place on 20 and 21 September, followed by a field tour to demonstration sites in the Tashkent region, on 22 September. An overview of Program’s activities and achievements will be presented on the first day of the Meeting. The session “Agricultural Innovations in Central Asia and the Caucasus: promoting adaptation to climate change and supporting integrated water resources management” will be open to interested partners from a wider range of research and development agencies. The second day will provide the opportunity to discuss future priorities of collaborative agricultural research-for-development in the Region including governance of the Program.

FIELD DAYS

Wheat Field Day held in Kibray, Uzbekistan

On 16 May 2011, ICARDA-CAC and Uzbek Scientific Production Center for Agriculture (UzSPCA) jointly organized a Wheat Field Day at Uzbek Research Institute of Plant Industry in Kibray, Uzbekistan.

Prof. Amir Amanov, Director General of the UzSPCA, explained objectives of the Wheat Field Day to the participants. Drs. Zakir Khalikulov and Ram Sharma from ICARDA-CAC highlighted the ongoing collaboration between UzSPCA and ICARDA in Uzbekistan, demonstrated the improved varieties and many outstanding advanced lines of winter wheat developed through such collaborative research activities. Wheat experts from UzSPCA and scientific research institutes from Tashkent, Karshi, Gallaral, Syrdarya, Namangan, Fergana and Karakalpakstan as well as several young scientists and postgraduate students participated in the event.

The participants observed improved germplasm of wheat, which was received from Turkey/CIMMYT/ICARDA International Winter Wheat Improvement Program (IWWIP). Besides, advanced wheat yield trials resulting from selection in past years by different wheat improvement programs in Uzbekistan were also evaluated. A nationally coordinated winter wheat trial is being evaluated at five sites in Uzbekistan, including Kibray. The young scientists participating in the event had an excellent opportunity to learn from experienced wheat experts.

The participants were highly appreciative of the event and ICARDA's extensive collaboration on wheat research with Uzbekistan. It was decided to organize another meeting at the end of 2011 to evaluate the results from all five sites in Uzbekistan and to national yield trials for 2011-2012.

Drs. Ram Sharma and Zakir Khalikulov, ICARDA-CAC

Participants of the Wheat Field Day in Kibray
(Photo by Mr. Sherzod Qosimov)

Conservation Agriculture technologies presented during the Field Day in Chimkent, Kazakhstan

The Field Day was organized on 16 June 2011 within the framework of the FAO/TCP project on Conservation Agriculture for Irrigated Areas in Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan and with the support from the South-Western Research Institute of Livestock and Plant Industry of Kazakhstan. Altogether 35 participants, mostly farmers, staff of Sayram district administration (South-Kazakhstan Province), mass-media representatives and scientists have attended the event.

The Conservation Agriculture Field Day highlighted bed planting technologies for agricultural crops to be widely distributed in the South-Kazakhstan province. Regional coordinator and national consultants of the project made presentations on several topics, including bed planted winter wheat and spring barley, water saving technologies and socio-economic issues of the conservation agriculture. During the discussions the regional coordinator and national consultants answered many specific questions raised by the participants.

While visiting winter wheat and spring barley fields, participants discussed the current issues of wheat production sector. Based on the field experiments conducted on the project's demonstration site, it was noted that the water shortage restricted the growth of winter wheat, resulting in lower field performance of the crop. At the same time, according to the findings from these experiments wheat was the more suitable crop for planting in the demonstration fields of the project's pilot farm. During the Field Day it was also noted that conservation agriculture is feasible for application in the irrigated areas of South Kazakhstan province.

Dr. Aziz Nurbekov, ICARDA-CAC

Participants of the Field Day discussed current issues of wheat production sector in Kazakhstan.
(Photo by Dr. Aziz Nurbekov)

Conservation Agriculture Field Day in Azerbaijan

In the framework of the same project on Conservation Agriculture, another Field Day was organized on 21 May 2011 at the farm of Ehtibar Jumshudov, a farmer in Zumirjan village, Terter district of Ganja region, Azerbaijan. The event was attended by 33 participants including farmers, project national consultants, staff of agricultural consulting centers, a seed specialist, a journalist and the invited scientists from

Winter wheat planted on beds
(Photo by Dr. Aziz Nurbekov)

Azerbaijan Research Institute of Crop Husbandry.

Winter wheat production technology was the main focus of the training offered to the participants by the experts of the project. During discussions, it was highlighted that conservation agriculture is becoming increasingly important in view of the declining water availability, labor shortage, emerging water erosion issues, increasing fuel and fertilizer prices, etc. Participants benefited from showcasing the results of the farmer participatory field trials on winter wheat planting on beds from previous projects in Azerbaijan, which were shared and discussed during the event.

It was overall an interactive event where every component technologies of conservation agriculture were discussed by the participants. National TV channel covered the Field Day and interviewed Aziz Nurbekov, Project Regional Coordinator, ICARDA-CAC and Imran Jumshudov, Agronomist, Azerbaijan Research Institute of Crop Husbandry. The Field Day once again demonstrated farmers' interest in adopting bed planting technology for its reduced water consumption and production cost along with increased yielding advantages.

Dr. Aziz Nurbekov, ICARDA-CAC

RESEARCH HIGHLIGHTS

Towards transparent water distribution within Water Users Associations in Fergana Valley

(Photos by Mr. Umedjon Gufranov)

The Water Productivity Improvement (WPL) project experience suggests that improved water management can considerably contribute to increased agricultural production, farmers' incomes, water savings and reducing water conflicts. Specifically, such benefits can be enjoyed by farmers, if Water Users Groups (WUGs) and Water Users Associations (WUAs) are able to put in place volume-based water charges. Volume-based water distribution involves measurement structures for monitoring volume of water delivered to individual farmers. Today, most WUAs do not have such structures in place or even if the WUAs have them, they are few in numbers and are in dilapidated condition. Hence, there is a need to construct or reconstruct such structures. Proper water flow measurement and water delivery accounting is essential for achieving transparency in water administration. For these reasons, Swiss Agency for Development and Cooperation decided to support construction of Water Flume Meters (WFM). Eight WUAs in Fergana Valley were fully equipped with water flume meters under this project.

"Akhror Mirob Muminjan" is one of the WUAs that are fully equipped with flow meters. This WUA is located in the command area of Shahimardansay in Fergana province of Uzbekistan, and was established on 30 January 2007. It covers 1890 ha of area and serves 45 farms. To enable successful project implementation, simple user friendly guidelines and posters on construction of different types of flow measurement structures were prepared for mirabs (water-transporting workers) of WUAs and leaders of WUGs, and on-the-job training was conducted in the construction sites. The project was implemented entirely in a demand–driven and user-oriented fashion with full involvement of water users throughout the whole construction process from planning to completion during which they acquired knowledge and practical skills in construction, water measurement, water accounting, and record keeping.

Main achievements of the project are as follows:

- WUA mirabs were trained in construction of water measurement structures;
- Transparency in water distribution has increased considerably, and the number of water related conflicts among water users and between water users and mirabs has dropped significantly water conflicts due to water flume meter constructed;
- Introduction of volumetric water charges and time-based water distribution within WUAs have been facilitated;
- Assessment of losses in secondary and tertiary canals has been conducted; and
- Assistance in calculation of water productivity for major crops has been provided.

Dr. Mohan Reddy Junna and Kahramon Jumaboev
IWMI Central Asia Office

Research internship experience with IWMI in Central Asia

Dominic Stucker collaborated with Kai Wegerich, Murat Yakubov and Jusipbek Kazbekov from the International Water Management Institute (IWMI) Central Asia office in Tashkent to conduct research on cooperative water management in the Khudjabakirgansai, a small transboundary tributary (STT) of the Syr Darya basin. He visited Central Asia from 3 May to 5 June and later reported: "My research trip with IWMI was an unparalleled and stimulating learning experience, supported by a talented team of colleagues." Dominic is a Research Intern with IWMI, in addition to Coordinator with Sustainability Leaders Network, Steering Committee Member of the International Union for Conservation of Nature and Natural Resources (IUCN) Commission on Education and Communication, and Member of the Amu Darya Basin Network.

Dominic Stucker with village aksakals (elders) in Kulundu, Kyrgyzstan. (Photo by Mr. Umedjon Gufranov)

He learned about local cooperation on water management, as well as key barriers, especially in terms of adapting to droughts and flashfloods. Research questions included population and livelihoods; water sources, quantity, and quality; natural disasters and climate change; and water governance.

Over three weeks, Dominic, along with field interpreter Umedjon Gufranov, made site visits to six water user associations (WUAs) in the Tajikistan and Kyrgyzstan parts of the basin. They interviewed a total of 20 water experts and managers at the provincial, district and community levels, in addition to conducting 49 household surveys. Dominic and Umed joined mirabs in their daily water allocation work, visited key water infrastructure sites, and toured canals damaged by flashfloods. They enjoyed the natural scenery in the upper basin, taking a day hike into the mountains, but also viewed widespread refuse in the lower reaches of the riverbed.

Initial research findings were presented to 31 participants at a stakeholder workshop facilitated by Dominic, Murat, and Jusip on 30 May at Plotina Dam, near the Tajikistan-Kyrgyzstan border. Thereafter, participants engaged in small group discussions on key, self-identified issues in the basin. Through an anonymous evaluation, many reported that they liked being able to choose their own discussion topics; welcomed discussion of the ecology of the basin; and want more such workshops. Research findings included:

Water Demand and Accessibility

- Over the past 20 years, demand for water has increased due to growth of the largely agrarian population; modest expansion of croplands upstream; and continued planting of crops, predominantly downstream, that require a lot of water and/or require water at very specific times.

- In parallel, water losses occur due to increased subdivision of existing croplands and related inefficiencies; increased number of inexperienced farmers; deteriorating and damaged concrete and earthen canals; and malfunctioning of pumping stations or electricity outages.

Natural Disaster Trends

- Climate change is altering precipitation patterns, contributing to an overall decrease in river volume since 1945. The variability of river flow volume is also increasing, resulting in greater fluctuations from year to year.

- Glaciers are melting, but have not yet disappeared all together, contributing to significant decreases in river volume in May and June, an increase in July, and decreases for the rest of the growing season. Such "natural" decreases contribute to droughts, as does water loss and inaccessibility, discussed above.

- In a neighboring, parallel STT, data shows an increasing variability of flashfloods since 1987, meaning years of no flashfloods interspersed with years of steadily increasing numbers of flashfloods. Given that upstream heavy rain is the main factor in causing flashfloods, this also indicates increasing variability of rains.

Preparing for and Responding to Natural Disasters: Conflict and Cooperation

Consistently positive reports were received in both Tajikistan and Kyrgyzstan of good cooperation on water management at different levels. Cooperation may be strained in the next 20-30 years, however, by population growth and climate change impacts. If conflict emerges, it may be exacerbated and/or sparked by one or more of the following factors, reported by interviewees as increasing tension:

- Water loss and inaccessibility (scarcity) during the irrigation season; upstream users' solid waste disposal into river/canals (both within Tajikistan and Kyrgyzstan,

and transboundary); perception by both sides that the other is building houses on their land; perception by Tajikistan side that Kyrgyzstan side is significantly expanding irrigated fields and is growing a lot of water intensive rice (evidence was found that supports the contrary); concern by some on Tajikistan side about building of possible reservoir in Kyrgyzstan; concern by some on Kyrgyzstan side that trucks from Tajikistan remove riverbed stones from Kyrgyz territory.

Significantly, tension does not appear to be ethnically based, especially given the mix of Tajiks, Kyrgyz, and Uzbeks in both parts of the basin. According to interviewees, cooperation is promoted by sufficient, accessible water during the irrigation season, current friendships, and a good history of working together.

This table shows selected examples, at different levels, of how some water officials, managers and farmers have prepared for and responded to natural disasters.

	Drought (mainly Mar, Apr, May)		Flashfloods	
	Prepare	**Respond**	**Prepare**	**Respond**
WUA	repair/clean canals through hashar; build haus (water pool) in home; plant drought-resistant seeds	water sharing among all three WUAs on respective sides of basin; decide not to plant a second crop	repair/ clean canals through hashar (community volunteer projects); early warning call to downstream WUAs	repair/clean canals through hashar and donations from local government and individuals
District, Province, & Nation	provision of machinery to repair/clean canals; provision of drought-resistant seeds	water sharing between Rasulov and Gafurov districts in Tajikistan; (Kyrgyz side of basin is all in one district)	provision of machinery to repair/ clean canals; provision of iron wire cages (that get filled with stones) to reinforce banks by Kyrgyz Ministry of Emergency Situations	provision of machinery to clean/repair canals and sometimes limited funds from respective Ministries of Emergency Situations
Trans-boundary	internationally-funded capacity building and cooperation projects	1962 water agreement: 79% for Tajikistan, 21% for Kyrgyzstan; if insufficient, Tajik side asks Kyrgyz side to let water flow through	Kyrgyzstan gives early warning call to Tajikistan; internationally-funded capacity building and cooperation projects	Tajikistan has lent out machinery to Kyrgyzstan to repair/clean nearby canals

While it is too early to make recommendations based on the above research, these will be included in an article in the Mountain Research and Development Journal and in a chapter for an Earthscan volume. Some of the lessons learned can be extrapolated to other STTs in Central Asia and show how, despite national-level tension on water issues, local communities can find solutions for cooperation.

Dominic writes: “This research would have been impossible without the network of water experts and managers that IWMI has created in the field; I was welcomed everywhere as a guest. I am very grateful to Mamurjon Saidahmodov and Abduhakim Abdusaminov in Tajikistan and Salimjon Jaliliev and Akjol Holibekov in Kyrgyzstan for helping me arrange interviews with key stakeholders. My multi-talented field interpreter Umedjon Gufranov, the hospitable and supportive Isroilov family, and families in Kyrgyzstan who took us in were all essential. Finally, I thank the key donors for this project, the United States Agency for International Development (USAID) and the Brown International Advanced Research Institute (BIARI).”

Dominic Stucker (dominic.stucker@gmail.com)

AVRDC leads Regional Varietal Trial

In 2011, AVRDC initiated a regional varietal trial in eight countries of Central Asia and the Caucasus with a total of 86 accessions of six vegetable species under evaluation, including tomato (6 lines to 5 countries), sweet pepper (5 lines to 6 countries), eggplant

(3 lines to 2 countries) and hot pepper (5), soybean (5) and cabbage (7) in various countries. Additionally, 111 accessions of 13 vegetable species were introduced on request received from various research institutes of CAC countries.

Moreover, competitive variety trials of 38 promising lines of nine vegetable species selected on the basis of study in previous years were continued in all the CAC countries in 2010 and more than ten new varieties will be submitted to the State Variety Testing Commission in the next years. Nowadays, 23 varieties of seven vegetable species, including tomato, sweet and hot pepper, eggplant, vegetable soybean, mungbean, yard long bean and cabbage are under state variety trials in Armenia, Azerbaijan, Kazakhstan, Tajikistan and Uzbekistan. It is widely held that these varieties have no analogues in the CAC countries in terms of morphological and economic marketable traits. The seed multiplication of promising and released varieties is being conducted to supply farmers with qualitative seeds for a wide cultivation. Growing new varieties help farmers to increase their income and improve livelihoods. Released varieties have a potential to increase the area of cultivation and production, to diversify diets, to increase the export potential of fresh and processed products and increase farmers' incomes.

Dr. Ravza Mavlyanova, AVRDC - The World Vegetable Center

Display of studied vegetable germplasm in Azerbaijan Research Institute of Vegetable Growing.
(Photo by Fuad Mamedov)

NEW PROJECTS

A new project on crop diversification for improving of livestock productivity and livelihoods of farmers launched in Central Asia

A three-year project titled "Sorghum and Pearl Millet for Crop Diversification for Improved Crop-Livestock Productivity and Farmers Livelihoods in Central Asia" funded by the Islamic Development Bank (IDB) and coordinated by ICBA-CAC in close collaboration with ICRISAT, ICARDA-CAC and the national agricultural research systems (NARS) of three partner countries in Central Asia was launched in July 2011.

An Inception Workshop to start the Project implementation was conducted on 14-16 June 2011 in Tashkent, Uzbekistan. The program started with welcome speeches on behalf of Ulugbek Kuchiev, Chief of Livestock Department of the Uzbek Scientific Production Center for Agriculture under the Ministry of Agriculture and Water Resources of Uzbekistan, as well as Dr. Shoaib Ismail (ICBA HQ) and Dr. Zakir Khalikulov, Deputy Regional Coordinator of ICARDA-CAC. The workshop was also attended by Dr. Abdulla Dakheel (ICBA HQ), the Coordinator of the Project, Dr. Gupta, SK (ICRISAT- India), Heads of NARS and leading scientists from Kazakhstan, Uzbekistan and Tajikistan.

Discussion of annual work plan with Kazakh partners
(Photo by Mr. Sherzod Qosimov)

The discussions were organized in joint sessions and in working groups by each country and were dedicated to the issues related to soil-water management, crop management and socio-economic components. During the Workshop, issues concerning project management were discussed and finalized, including work plans and budgetary line items.

The main goal of the Project is to contribute to the improvement of livelihoods of farmers in salinity-affected and marginal environments in Central Asia through the development and dissemination of high-yielding, salinity-tolerant sorghum and pearl millet lines and cultivars, as well as crop management technologies for economic and sustainable crop-livestock production systems in Tajikistan, Uzbekistan and Kazakhstan.

The main objectives of the new Project are to:

- Evaluate a wider range of germplasm of sorghum and pearl millet as a new sources of variability for enhanced grain and fodder yield;
- Select improved pearl millet and sorghum varieties for grain and fodder productivity adapted to crop-livestock production systems, which are common in the Central Asian countries; consider the opportunities for the best regional conservation (in situ/ex situ/on farm) of plant genetic resources of these crops;
- Develop and disseminate packages of crop production and utilization technologies to farmers to enhance pearl millet and sorghum productivity;
- Involve farmer participatory approach and efficient seed production and seed delivery systems for pearl millet and sorghum;

- Identify acceptance of sorghum and pearl millet grains for food, poultry feed and fodder in household and livestock farm sectors;
- Assess the impact of technology development and adoption on enhancement of crop-livestock productivity and its profitability for farmers;
- Build the capacity of NARS and farmers in cultivar development, seed production, crop management and utilization of these crops;
- Create databases of pearl millet and sorghum for their origin characteristics and performance in the Region.

The activities within the project include the establishment of on-farm demonstration trials for using of open pollinated varieties and improved lines of sorghum and pearl millet, which were identified during the previous project (2007-2009). They appeared to have high yield potential (both grain and fodder) under saline conditions in Central Asia. This plant material is expected to be extensively evaluated in on-station and farmer-participatory on-farm trials in Tajikistan (both in northern and southern parts), Uzbekistan (including Karakalpakstan) and Kazakhstan (under condition of Priaralie and rainfed areas of southern Kazakhstan).

National research programs and farmers in the Region will obtain technical expertise and increased capacity in various aspects of seed production at the local level in order to meet the demands of high quality seeds and for scaling up to larger number of farms.

Soil, water and socio-economic information will be collected to verify that biosaline technologies are profitable and sustainable. Demonstration plots of successful production systems will be established with full farmer participation, with particular attention to the participation of rural women. Enhancement of the productivity of forage-livestock systems in Central Asia and its impact on the livelihoods of the vulnerable rural population, in particular women farmers involved with livestock husbandry, will be measured.

In the initial stage of the project, knowledge gaps that represent major constraints to enhancing the adoption and productivity of these crops in the salt-affected farm lands will be identified by the international institutes and NARS. Additionally, all partners (ICBA-CAC, ICRISAT, ICARDA-CAC and NARS) will implement a comprehensive capacity building program that will involve developing technical knowledge of local staff in breeding techniques of these two valuable crops, large scale seed production and management practices. Farmers' skills in crop management and on-farm seed production will be enhanced through demonstrations and field days.

Dr. Kristina Toderich, ICBA-CAC

ADAPTATION TO CLIMATE CHANGE

Case Study presented during the conference in USA

Dr. Stefanie Christmann, Environmental Specialist, ICARDA-CAC, was invited to the ICARUS II Conference, held on 5-8 May 2011 at the School of Natural Resources and Environment of University of Michigan in Ann Arbor (USA) to present the Case Study "The unheeded potential of mountain villages to adapt to glacier loss and climate change requires urgently full attention", which was conducted in 2010 in Zerafshan mountains (Tajikistan) in co-authorship with Dr. Aden Aw-Hassan, ICARDA HQ in Aleppo (Syria).

The presentation by Dr. Christmann, who was the only participant from Central Asia and the Caucasus in this event, was welcomed by the participants. Specifically, the participants were interested in guidelines on specific participatory method to develop local climate change adaptation strategies.

The conference included presentations from all continents on local and regional collective action approaches to cope with and to adapt to climate change. The conference identified special focus fields for socio-economic research on climate change, such as links between research and policy, integration of socio-economic and economic-environmental research, improving access to already existing knowledge (e.g. from case studies and indigenous knowledge), clarification of the term "vulnerability", as well as rights of local populations.

Dr. Stefanie Christmann, ICARDA-CAC

School of Natural Resources and Environment of University of Michigan in Ann Arbor (USA)
(Photo by Dr. Stefanie Christmann)

Potato in temperate Asia: Conserving water, enhancing incomes

The temperate regions of Asia include portions of China, Mongolia, Korea, Turkey, the southern Caucasus, and Central Asia. In all of those countries, potato is an important cash and staple crop that contributes vital nutrients to the diets of the poor. In Central Asia, where potato production is second crop only after the wheat, consumption rates rank among the highest in the world.

Production systems vary across the temperate zone from diversified, single cropping to intensive double cropping. Potato pests and diseases affect yield and profitability. Water shortages are linked to both greater competition and climate change. Since the former Soviet Union countries gained independence, investment in research and development has been limited. Consequently, many old local and Russian potato varieties have been lost. Because the local supply of quality seed tubers is also limited, the majority of farmers rely on farmer-saved seed (FSS) and, secondly, on expensive imported seed, much of which is poorly adapted to local conditions.

These problems often deny poor consumers access to a crop that could greatly reduce malnutrition. The absence of nutrient-rich food, a common occurrence in certain parts of Central Asia, is responsible for high mortality rates among young mothers and children under the age of five.

CIP is helping national partners develop varieties resistant to biotic and abiotic stress, improve farmer-based seed production systems, develop effective management practices, and influence policies that promote more durable management of natural resources. In the future programme, priorities for this area will include:

- Development of high yielding, disease resistant, early and drought-heat tolerant varieties for long day conditions;
- Development of appropriate technologies and practices for improved crop management and increased water use efficiency for potato cultivation combined with risk analysis of water shortages for potato under climate change scenarios.

Climate change is affecting Central Asia at a more rapid rate than many other parts of the world, adding pressure on abiotic stresses (e.g., heat, drought, increased soil salinity) as well as biotic ones, such as virus diseases that reduce production in warmer lowland areas. In more humid mountainous areas of the southern Caucasus, for instance, late blight disease has a critical impact on yields and profitability. Water shortages are becoming an increasingly important problem due to greater competition for water resources and need for improved water management. Because of its high water use efficiency, potato can gain support among policymakers as a substitute for other less water efficient crops. CIP is working to develop potatoes that offer late blight and virus resistance, increased water use efficiency, with high iron and zinc bio-availability due to the high content of vitamin C that stimulates micro-nutrients absorption, and that also meet consumer preferences. In addition, we are focusing our research activity on the development of early and heat-tolerant potato varieties that can be planted during what is traditionally considered the non-productive summer fallow period between two consecutive wheat crops.

Dr. Carlo Carli, CIP-Tashkent

Evaluation of CIP-bred clones for tolerance to drought in Tashkent (a), to salinity in Sirdarya (b) and to heat in Fayzabad and Muminabad (c, d), Tajikistan.
(Photo by Dr. Firuz Yuldashev)

Modeling of winter wheat growing in Central Asia

The ongoing work on biophysical assessment component of joint ICARDA-IFPRI multi-disciplinary project titled "Adaptation to Climate Change in Central Asia and People's Republic of China", which is implemented in close collaboration with NARS partners from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, is coming to the final stage. In order to assess the biophysical impact of climate change on wheat (Triticum aestivum) production and productivity a calibration of the crop-simulation model CropSyst was carried out for 15 winter, spring and facultative wheat varieties included into the State registers of varieties accepted for cultivation.

Experimental data obtained from 20 sites within different agro-ecological zones were used for the calibration. Usual farming practices, including irrigation and fertilization rates, were estimated from analysis of survey data provided by socio-economical group of the project. Monthly meteorological data estimated using long-term average data for the reference period of 1961-1990 and absolute deviation of air temperature and relative deviation of precipitation provided by GIS Unit of ICARDA-HQ for chosen climate

Dr. Glazirina familiarizes scientists of Kazakh Research Institute of Soil Science and Agro Chemistry named after U.U. Uspanov with calibration of CropSyst model and intermediate results of the project obtained for Kazakhstan.
(Photo by Mr. Tulkun Yuldashev)

Villagers discuss adaptation options presented by Mrs. Yulduz Nurmurodova, Papanaya village
(Photo by Dr. Stefanie Christmann)

Women group: cooking "dual purpose" crop dinner
(Photo by Dr. Stefanie Christmann)

change scenarios for all considered sites are disaggregated (transferred into daily data) using two weather generators, LARS-WG and ClimGen. Results of on-going assessment of impact of climate change on wheat production and productivity will be provided to socio-economical group of the project along with recommendations on improving of management techniques for better adaptation to climate change.

In the framework of the project, the multi-lingual version of the CropSyst model's graphical user interface has been translated into Russian, Uzbek, German and Arabic, and successfully tested on the job and shared with interested scientists in the Region.

In the beginning of May 2011, members of the biophysical group of the project, Dr. Rolf Sommer, Dr. Mariya Glazirina and Mr. Tulkun Yuldashev visited NARS partners in Kazakh Research Institute of Soil Science and Agro Chemistry named after U.U. Uspanov (JSC KRISSAC), with the purpose to discuss the achievements of the project, share results of CropSyst model calibration and simulation carried out for Kazakhstan winter and spring wheat experiments, consult NARS partners on using CropSyst model, and discuss proposals for further joint project.

Dr. Mariya Glazirina and Mr. Tulkun Yuldashev, ICARDA-CAC

Villagers discuss local climate change adaptation strategies

Within the project "Strategic dual purpose crops and mobilization of underutilized plants as part of a climate change adaptation strategy" (Case study in semidesert foothills rangelands near Papanaya settlement, Nurata district, Uzbeksitan) two village meetings in Papanaya and Kadok were conducted in the beginning of June 2011.

In each village about 50 male and female participants discussed the local climate change adaptation strategies, which had been developed in November 2010 (in Papanaya) and April 2011 (in Kadok) in collaboration with the villagers, representing all age groups and household types. All presentations were done by both men and women, who collectively assessed their vulnerability to climate change and developed adaptation options that they want to undertake by 2020.

In the long term, main sources of income in the region may be at risk as high temperatures and reduced days with snow cover endanger grape production. In Kadok village, for instance, options for more sustainable livestock production and reduction of mudflows from foothills were the main issues. Diversification of agriculture and economy in general, rain water harvesting on the home plot and more efficient use of water were identified as crucial activities of adaptation to climate change. In both villages the meetings were hosted the by villagers, who realized their chances and the need to start the adaptation process as soon as possible. They recognized that they already possess many skills needed for adaptation to climate change and highlighted the need for more advanced education in the area of irrigation, conservation agriculture, rangeland and medicinal plants, fruit production and foreign languages for the young people of the villages.

The women groups, established within the project in each village, cooked dinners for the village meeting using dual purpose crops, which they grow on their fields. In April, training was provided on processing dual purpose crops including new dishes. The villagers very much appreciated women groups' work and the owner of a wedding site in Papanaya village even declared that he would recommend the women group to his clients. In both villages the women groups intend to offer preparation of such dishes for weddings and later to identify further marketing options.

Dr. Stefanie Christmann, ICARDA-CAC

Combating potato late blight in Central Asia and the Caucasus

Late blight (LB) is widely recognized as the worst disease of potato. The fungus-like pathogen Phytophthora infestans can rapidly adapt through mutation or migration. LB results in an estimated $10 billion worth of losses each year in potato crops of the developing world alone. The impact on developing countries is especially harsh as they are home to the majority of potato farmers, many of whom depend on potato for economic survival and food security.

An insidious problem related to LB is the health risk to farmers and their families as a result of chronic exposure to the pesticides employed to control the disease. The most common

products used – dithiocarbamates, such as mancozeb – are suspected to be carcinogens.

Rising pressure from climate change is adding greater urgency to the problem. "With warming trends, which accelerate the spread of the disease, we are seeing increased risk in areas as diverse as the Andean highlands, the lake region of Sub-Saharan Africa, Southern Caucasus and parts of Central Asia (highlands of Kyrgyzstan and Tajikistan), and southwest China and Nepal, not to mention Northern Europe and the United States," notes Greg Forbes, CIP plant pathologist.

In November 2009, CIP coordinated a meeting in Bellagio, Italy, uniting scientists from 21 developed and developing countries to plan a global strategy for combating LB disease. The result was "Late Blight: Action Plan for an Effective Response to a Global Threat", a white paper directed at policymakers and donors. It recommends five actions for employing rapid solutions to the LB problem based on existing capacities and technologies.

Late Blight Action Plan recommendations are as follows:

- *Get resistant cultivars to farmers. Farmers still largely use susceptible cultivars and depend on fungicides to combat LB. They need access to resistant cultivars adapted to local consumer demands and microclimates;*
- *Improve farmers' capacity to manage disease. To mitigate and manage LB in the field, farmers need intensive, participatory training, which requires the support and involvement of key stakeholders, including farmers, national and international research and development organizations, donors, governments, and NGOs;*
- *Know the enemy and develop a community of skilled pathogen monitors. Greater coordination and standardization at all levels is needed to track disease mutation and migration;*
- *Develop ecologically-based approaches to control LB. Host resistance is a primary approach, but it should be enhanced with complementary control practices, such as low-toxicity pesticides and crop management techniques;*
- *Coordinate and monitor progress and risk assessment. Greater coordination among researchers through networks and other modalities is needed, along with tools, such as long-term databases of hosts and pathogens, to map and monitor progress in the use and durability of resistance and risk patterns associated with climate change*

Therefore, in order to develop a strategy against LB in the CAC Region, trials have been initiated in Georgia (Akhalkalaki district) and Tajikistan (Garm district) at farmer level using CIP clones issued from the LTVR (Lowland Tropic Virus Resistant) population, waiting for more performing and adapted clones that are under selection in the long day regions of South America. In Georgia, during preliminary observations conducted in 2010, our partners observed how those clones showed only a few LB symptoms after only one spraying against the disease, while the surrounding fields cultivated with European varieties were heavily infected. To be sure that our germplasm – selected for other traits – is not characterized by vertical resistance[1] to the disease, our partners set up two trials in May 2011, one under very high disease pressure like the one set up in the mountains of Georgia, and the other in a region that was not considered as affected by such disease because of more arid conditions, like the southern part of Rasht valley. In Georgia, in fact, aggressive strains of the fungus have been always reported, particularly in the south-western region of the country where humid airstreams from mainland and Black Sea often gather together towards the months of July-August with consequent rainfalls and severe late blight infection (Dr. G. Aleksidze: personal communication). In Tajikistan, on the contrary, the fungus appeared only recently and we think that this is more likely depending on the consequences of climate change. Bearing in mind the difference between Early (Alternaria solani) and Late Blight (Phytophthora infestans): while the first happens early in the season, normally the first symptoms of Late Blight are noticeable during the end of July – beginning of August. If symptoms of Late Blight occur before that period, it is because farmers plant seed tubers already infected by the disease.

Dr. Carlo Carli, CIP-Tashkent

Akhalkalaki, Georgia: CIP clones at the end of August 2010.
(Photo by Mr. Aleko Zubiashvili)

Garm, Tajikistan: Early blight (Alternaria solani) symptoms confounded with those of Late Blight (June 2011)
(Photo by Mr. Matt Curtiss)

1 Vertical resistance is limited to only one strain of the disease and, therefore, can be easily broken down once new strains of the disease appear. Tendency now is to go for horizontal resistance that is many-gene resistance complemented with a few fungicide treatments instead of 10 and even 15 spraying as it happens for many potato varieties with vertical resistance that was broken down after a few years.

MEETINGS

Institutional options for river basin management

Dr. Jonathan Lautze visited the IWMI Central Asia office between 16 April and 2 May to support the Small Transboundary Tributaries component of the Integrated Water Resource Management in Fergana Valley (IWRM FV) project. Dr. Lautze is an IWMI researcher currently seconded to USAID in Washington, D.C. As part of his visit to Central Asia, Dr. Lautze collaborated with three IWMI-CA staff (Kai Wegerich, Murat Yakubov and Jusipbek Kazbekov) to finalize a paper on institutional options for river basin management. He then travelled with Murat and Jusipbek to the field to meet with Kyrgyz and Tajik stakeholders, in order to understand their preferences for institutional development in one small transboundary tributary to the Syr Darya - the Khojabakirgansai river. Among the issues discussed were i) options for water-related data sharing between countries, ii) managing sub-basins independently versus packaging sub-basins into one management structure, and, iii) what are the needs, motivations, hindering factors and organizational options (permanent maintenance organization for the whole basin or a seasonal and unpaid body).

Findings revealed that the frequency of data sharing may in fact be a core issue for trust-building in the Region. Alternative views appeared to exist on treating sub-basins independently versus grouping them. For instance, from the upstream perspective, grouping sub-basins would be a good way to join efforts and resources with the downstream riparians (stakeholders) to enable construction of a dam or at least share in its maintenance costs in future or re-consider current allocation shares in the river flow. Downstream riparians (stakeholders) mentioned increasing water scarcity due to upstream irrigated area expansion and the need for more transparent water distribution as key drivers for institutional strengthening at a transboundary level.

Several other challenges became apparent, namely, the deeply-rooted nature of water sharing in Fergana, linkages to broader political disagreements, as well as the somewhat uncoordinated approach of donors. Finally, based on inputs received in the field, Dr. Lautze contributed to the initial design of a program of workshops for constructing a new river basin organization.

Dr. Jonathan Lautze, IWMI researcher

Meeting of National Steering Committees of Bioversity International/UNEP-GEF project in Kazakhstan

Participants of the 6th National Steering Committee Meeting
(Photo by Mr. Yuriy Alekseev)

The Sixth meeting of National Steering Committee (NSC) of Bioversity International/ UNEP-GEF project “In situ/On farm Conservation & Use of Agricultural Biodiversity (Fruit Crops & Wild Fruit Species) in Central Asia” was conducted in Kazakhstan, on 22-23 April, 2011. The main objective of the meeting was review of project progress, made in Kazakhstan in 2010. Results of work on policy and legislation; results of expeditions, conducted in 2010; results of inoculation works; and main financial expenditures in 2010 were presented during the NSC meeting. Reports on implemented activities on components “Public awareness”, “Broad Participation and Strong Partnerships”, “Capacity Building” were provided to participants. As a result of NSC meeting recommendations and proposals for further implementation of project activities in 2011 in Kazakhstan were put forward and approved. Draft budget for 2011 was reviewed; work plan, budget and monitoring plan for 2011 were adjusted and approved.

Ms. Muhabbat Turdieva, Bioversity International

Findings from scientific research presented on the International Conference on Arid Land

Altogether nine Conferences on Desert Technology were held starting in 1991. They addressed mostly the natural characteristics of desert and desertified areas (e.g. climate, hydrology and vegetation), the mechanisms of desertification, prevention methods and transferring of technologies for rehabilitation and conservation of arid and semiarid landscapes. The conferences have been a great source of learning for researchers from the relevant countries who contributed their knowledge, technology and participated in the very productive working groups.

Based on previous experiences and accomplishments, the First International Conference on Arid Land combined with Desert Technology X was held on 24-28 May in

Narita-Tokyo, Japan. This event was attended by 142 participants from 29 countries. The participants had an opportunity to participate in comprehensive discussions, field trips and in the process of development of recommendations. The Poster presentations of different research projects included natural, technological, human and social aspects of science towards overcoming constraints of deserts and arid regions, desertification and climate change impact at national, regional and global levels.

The CGIAR Program for Central Asia and the Caucasus was represented by Dr. Kristina Toderich, ICBA-CAC through two oral presentations titled "Seasonal Variation of δ13 C value of Asiatic Desert Trees Related to Landscape Planning and Rehabilitation on Salt Affected Lands" and "Adaptive Fruit Structural Mechanisms of Asiatic Salsola species towards its Germplasm Conservation and Utilization" and by Dr Aziz Nurbekov, ICARDA-CAC with presentation on "Effect of tillage methods on productivity of winter wheat in the Aral Sea Basin of Uzbekistan". All three presentations generated interest among audience and were selected as reviewed articles for the Land Arid Studies Journal, which will be published as a species Issues at the end of this year.

The next meeting on Desert Technology XI is planning to be organized by Texas University, USA, in 2013.

Dr Kristina Toderich (ICBA-CAC) and Dr Aziz Nurbekov (ICARDA-CAC)

Participants of the International Conference on Arid Land Studies, Tokyo Japan
(Photo by Mr. Temur Khujanazarov)

International scientific forum and exhibition in Ashgabat

Every year on June 12, Turkmenistan celebrates the Science Day - the holiday established by President of Turkmenistan Gurbanguly Berdimuhamedov in 2008 to mark spiritual and intellectual priorities of development of the country and society. One of the most significant events in honor of this remarkable date was the International Exhibition and Conference on Science, Technology and Innovations in the Epoch of New Revival held in Ashgabat on 10-12 June 2011. The large-scale international event was organized jointly by the Academy of Sciences and the Chamber of Commerce and Industry of Turkmenistan.

The exhibition was attended by more than a hundred participants representing foreign companies, leading educational centers and research institutions of the Academy of Sciences of Turkmenistan, higher educational institutions, enterprises and departments affiliated to sectoral ministries and departments. The research institutions and companies from several countries presented their achievements, proposals and know-how in the sphere of nanotechnologies, computer, multimedia, information technologies and telecommunications, manufacturing and delivery of a variety of state-of-the-art equipment in the spacious pavilions of the Exhibition Centre.

(Left to right) Drs. Turok, Saparmuradov, and Smekalova discussing the exhibition at CGIAR booth.
(Photo by Mr. Nariman Nishanov)

The CGIAR CAC Program was represented by Dr. Jozef Turok, Head of PFU, CGIAR-CAC, and Mr. Nariman Nishanov, Socioeconomist, ICARDA-CAC, in both International Exhibition and Scientific Conference. Achievements of all CGIAR Centers in collaborative agricultural research for development in the Region were demonstrated during the exhibition by seed samples, manuals, booklets, and posters about the outcomes of research carried out in Central Asia and the Caucasus.

The major outcome of the exhibition became the meetings between heads of Turkmen research institutions, enterprises and organizations and potential partners that identified the fields of mutual interest and vectors of potential cooperation.

Considering the strategic importance of collection, conservation, studying, and rational utilization of plant genetic resources for food and agriculture, the various proposals on cooperation with NARS in Turkmenistan were developed jointly by ICARDA and N.I.Vavilov Research Institute of Plant Industry (VIR).

The discussions at the plenary meeting and seven sections of the scientific conference focused on the issues related to the scientific basis of development and application of innovative technologies in the power, chemical, fuel and energy, agro-industrial, medical, pharmaceutical, information and telecommunication sectors. The scientists discussed the issues related to ecology and efficient use of natural resources, economic development, international cooperation and law, humanities in the context of the scientific and technical progress. A great number of reports presented at the conference focused on the development of resource-saving technologies in Turkmenistan, in particular the use of alternative energy sources in the national economy. Dr. Jozef Turok made a presentation at the conference on the achievements of the CGIAR-CAC Program in the Region.

Those speaking at the closing ceremony were unanimous that the international scientific forum and exhibition in Ashgabat had significantly enriched their knowledge and understanding of the achievements of Turkmen scientists and made a considerable contribution to strengthening international scientific relations.

Mr. Nariman Nishanov, ICARDA-CAC

Information from State News Agency of Turkmenistan (TDH) was used for preparation of this article.

Regional Meeting of CACAARI experts held in Tashkent

Participants of the regional meeting of CACAARI experts
(Photo by Mr. Sherzod Qosimov)

Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI) is a regional platform of national and international institutions, which are active in agricultural research for development in the CAC Region and supported by the Global Forum for Agricultural Research (GFAR). Overall goal of this Regional Forum is to develop and implement a regional framework strategy for improving agricultural productivity in the CAC Region.

A regional meeting of CACAARI experts was held on 21-22 June 2011 in Tashkent. The main objective of the meeting was to discuss the issues of developing a regional strategy on improvement of agricultural productivity in line with principles on transforming agricultural research and development (AR&D) outlined in the 2010 Road Map of the Global Conference on Agricultural Research Development (GCARD). A group of distinguished international and regional experts are currently involved in developing of this strategy.

At the opening session, Acad. Djamin Akimaliev, CACAARI Chair, highlighted the importance of developing a regional strategy in line with the principles of the GCARD 2010 Road Map, as well as attracting investment and increasing financial support for AR&D in the Region. The GCARD 2010 Roadmap envisages significant increase in level of investment in AR&D by 2025, through attracting the attention of the high level policy makers in the CAC Region to the important issues of consistent and active regional and national advocacy for AR&D, strengthening the capacity of NARS, as well as regional and international partnerships and cooperation, thereby bridging knowledge gaps.

Dr. Zakir Khalikulov, Deputy Head of CGIAR-CAC PFU, noted the importance of close cooperation with CGIAR centers and their regional missions, which represents more advantages and opportunities for advancement of scientific research methodology of NARS partners, best practices and approaches in the AR&D, and urged to work together in solving current scientific problems in the agricultural sector of the CAC Region. Dr. Surendra Beniwal, the international consultant of CACAARI and Dr. Botir Dosov, national consultant, who were also involved in the development of a regional strategy, acted as moderators during the working sessions.

During the meeting, participants had an opportunity to discuss the financial issues and investment matters and also reviewed current status of AR&D in the Region. There were a number of presentations, including national reports on current situation in strengthening capacities and financial support of AR&D in each country of the CAC Region and outlines for regional strategy, as well as presentations on experience of other similar regional initiatives such as FARA and AARINENA (reports are available on the CACAARI website: www.cacaari.org).

All sessions of the meeting were chaired by representatives of each country. Dr. Surendra Beniwal provided comments and recommendations for the updating of national reports, as well as the methodology for the preparation of a regional brainstorming meeting with participation of policy makers of the Region, to be conducted in October 2011.

Dr. Alisher Tashmatov, CACAARI Executive Secretary, Tashkent

Knowledge Management and Decision Support for Sustainable Land Management: the WOCAT events in Kyrgyzstan

The World Overview of Conservation Approaches and Technologies (WOCAT) held its 15th Annual Workshop and Steering meeting, and the WOCAT Share Fair, from 21 to 27 June 2011, in Kyrgyzstan.

WOCAT is a unique consortium of national and international institutions, led by a core Management Group, and supported by the Swiss Development Corporation. The Secretariat of WOCAT is located at the Centre for Development and Environment in Bern,

Switzerland (www.wocat.net).

WOCAT's goal is to prevent and reduce land degradation through sustainable land management (SLM) technologies and their implementation approaches. The network provides tools that allow SLM specialists to identify fields and needs of action, share their valuable knowledge in land management, that assist them in their search for appropriate SLM technologies and approaches and support them in making decisions in the field and at the planning level and in up-scaling identified practices.

This year's Share Fair and Annual Workshop aimed to study SLM issues in Central Asia for the first time. A two-day WOCAT Share Fair on exchange of SLM knowledge management and decision support for global and local needs opened the meeting in Bishkek, followed by a 5-day WOCAT workshop and steering meeting in Naryn. The events addressed management and decision support solutions for global and local needs. Hot topics of discussion were:

- SLM and Climate Change Adaptation and Mitigation
- SLM and Water (watershed management, water use efficiency)
- SLM and flood/disaster mitigation and prevention
- SLM and Pastoralism (local assessment, mapping and priority setting)
- SLM and new developments / innovations (e.g. alternative energy)

The event gathered more than 100 participants from 25 countries. Following organizations were represented: a) Ministries of Agriculture and Water Resources from Kyrgyz Republic, Tajikistan, China, South Africa, Mongolia, Philippines, Cambodia and Senegal, b) partners from National Agricultural Research Systems such as Kyrgyz Agrarian University, Institute of Geoecology (Mongolia), Kathmandu University (Nepal), Centre for Development and Environment at University of Bern (Switzerland), Lomonosov State University (Russia) and many others; c) Non-Governmental Organizations such as Hilfswerk Austria International, Helvetas, Concern WorldWide and others; and d) Donor Agencies and International Organizations including SDC, FAO, UNCCD, UNDP-GEF, GIZ and Aga Khan Foundation, as well as ICARDA and IWMI on behalf of the Consultative Group for International Agricultural Research (CGIAR).

Dr. Jozef Turok, Head of the CGIAR Program Facilitation Unit for Central Asia and the Caucasus and MBA Oyture Anarbekov, Senior Research Officer from IWMI gave plenary presentations in the thematic topics "SLM and Climate Change Adaptation and Mitigation" and "SLM and Water (watershed management, water use efficiency)". They stressed the four major directions of applied research carried out by the CGIAR centers in the Region:

- Productivity of Agricultural Systems
- Natural Resource Conservation and Management
- Conservation and Evaluation of Genetic Resources
- Socioeconomic and Public Policy Research

Dr Turok highlighted some key findings from the research in particular on Natural Resource Conservation and Management as well as challenges and opportunities that are faced by the Regional Program during its implementation. He highlighted the possible synergies with WOCAT. Mr. Oyture Anarbekov's presentation focused on approaches and technologies to improve water productivity at plot level based on "Water Productivity Improvement on Plot Level" project activities and results. The presentation described water resources management in Central Asia stressing main indicators of water and land resources use, specifically for irrigation. He highlighted the main challenges in the Region with regard to on-farm water management.

Overall, a close collaboration between the CGIAR Centers and WOCAT offers mutual benefits. The CGIAR Centers generate agricultural innovations and could contribute their science and research results to the WOCAT database and out-scale the results using recognized WOCAT tools. For WOCAT, collaboration with the CGIAR offers application of some proven technologies from the Region in support of sustainable agricultural development.

Dr. Jozef Turok, ICARDA-CAC/PFU and Mr. Oyture Anarbekov, IWMI-Central Asia

Presentation by Oyture Anarbekov on improving water productivity in Fergana Valley
(Photo by Ms. Bolor Radnaabazar)

CAC Region participated in CRP 1.1 planning meeting

Central Asia Working Group
(Photo by Dr. Carlo Carli)

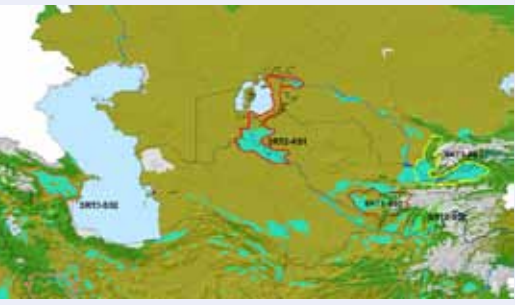
As a part of the global CGIAR reform, several multi-year and multi-Center thematic areas of work – the CGIAR Research Programs (CRPs) have been launched to date. They represent the key mechanism for delivery and implementation of the reform. The CRPs cover different areas of research involvement to address such challenges as Integrated Agricultural Production Systems in Dry Areas (CRP 1.1), Water Scarcity and Land Degradation (CRP 5), Climate Change, Agriculture and Food Security (CRP 7), and others (www.cgiar.org).

A four-day planning meeting on Integrated Agricultural Production Systems in Dry Areas Program (CRP 1.1) was organized in Nairobi (Kenya) on 27-30 June 2011. The meeting was organized by ICARDA, the lead Center of the CRP1.1, and attended by representatives of further Centers, as well as NARS partners from (i) West Africa, (ii) Eastern and Southern Africa, (iii) North Africa and West Asia, (iv) Central Asia and (v) South Asia, which represent five target geographic areas of the Program. The overarching challenge for CRP1.1 is to deliver benefits to the poor and vulnerable, especially women, who are the de facto household heads in many dryland agro-ecosystems. CRP1.1 will focus on target dryland areas/systems, identified by two criteria: (i) those with the deepest endemic poverty and most vulnerable people, often associated with severe natural resource degradation and environmental variability, and (ii) those with the greatest potential to impact on food security and poverty in the short to medium term. CRP1.1 will work closely with all other CRPs and many partners beyond, and add value to the outputs of all these CRPs. It will also provide information and feedback to other CRPs on how their research products can combine synergistically to improve the resilience of production systems.

Presenting Central Asia benchmark areas
(Photo by Mr. Tulkin Radjabov)

Central Asia was represented by Dr. Jozef Turok, Head of Program Facilitation Unit (PFU), CGIAR-CAC (Central Asia and the Caucasus Program), Dr. Carlo Carli, Head of CIP office in Central Asia and the Caucasus, Dr. Junna Mohan, Head of IWMI office Central Asia, Mr. Tulkin Radjabov, Project Officer, PFU, CGIAR-CAC, as well as NARS partners Dr. Abdirakhman Ombaev from Kazakhstan, Acad. Hukmatullo Ahmadov from Tajikistan, Dr. Ashir Saparmuradov and Murat Bayramov from Turkmenistan, and Dr. Zokhid Ziyadullaev from Uzbekistan. During the regional working group sessions, the participants discussed and identified potential benchmark area and action sites for implementation of CRP1.1 activities in the Region. Dr. Hukmatullo Ahmadov chaired the Central Asia regional working group and led discussions on action sites under SRT2 (Strategic Research Theme) pertaining to vulnerable drylands systems areas and under SRT3 pertaining to areas with good potential for sustainable intensification of agricultural production.

As a result of two days of very collegial work, the participants of the Central Asian group identified 2 benchmark areas, 4 action sites and 4 satellite sites to be established in the Region for carrying out research and introducing innovative approaches and technologies. The benchmark areas were selected based on the geographic, environmental and agricultural criteria set up by program design group. Moreover, ICARDA's GIS-group kindly provided all participants with various maps of the Region prepared on the base of different environmental and socio-economic data.



Selected Action Sites in Central Asia and the Caucasus under the CRP1.1 Program
(Map is courtesy of ICARDA GIS Group)

During the discussions, it was noted that Central Asia as a whole can be described as an area that mostly falls under SRT2, i.e. as having most vulnerable and rapidly degrading agro-ecosystems with only some fragmented areas that could be considered for SRT3 (i.e., with potential for sustainable intensification of agricultural productivity). The following sites were selected: the Aral-Turkistan Lowland of the Aral Sea Basin, including north-western Turkmenistan, western Uzbekistan and south-western Kazakhstan as the most relevant action site under the SRT2 representing typical downstream lowland irrigated areas, affected by high level of soil salinity and water scarcity, severe loss of agro-biodiversity and productivity. Since Central Asian landscape consists not only of lowlands but also upstream mountain areas, it was suggested to choose Rasht Valley, which is located mostly in Tajikistan and partly in Kyrgyzstan, as a second action site under SRT2. This area is strongly affected by soil degradation as a result of rapid glacier melting.

One action site and 2 satellite sites were selected within SRT3 benchmark area, which is not contiguous in terms of geographic location and represents different agro-ecosystems with highest potential for sustainable intensification of agricultural productivity. The SRT3 action site includes the territory of Fergana Valley (Kyrgyzstan, Tajikistan and Kyrgyzstan), southern Kazakhstan and southern Uzbekistan. Although Caucasus countries were not considered by the Consortium as target area for CRP 1.1, it was suggested to choose the lowland of Kura-Araks in Azerbaijan as a satellite site. It represents typical conditions for Southern Caucasus in terms of potential for intensification of agricultural production. In

addition, the Kashkadarya region of Uzbekistan was also selected as a satellite site.

The outcomes of the discussions within the Central Asian working group were presented to all participants of the meeting during the final plenary session. At the closing, the participants agreed to follow up on decisions of the meeting and introduce relevant modifications and amendments to the CRP1.1 Program Document. Moreover, it was highlighted that each region of concern will have to organize an Inception Workshop to engage all relevant local partners and donors.

Dr. Jozef Turok and Mr. Tulkin Radjabov, PFU, CGIAR-CAC

First Regional Winter Wheat Symposium in Tabriz, Iran

The First Regional Winter Wheat Symposium jointly organized by ICARDA-Iran, CIMMYT-Iran, and Iran Dryland Agricultural Research Institute was held from 25 to 27 June 2011 in Tabriz, Iran. This symposium brought together more than 80 winter wheat researchers from 12 different countries in Central and West Asia and North Africa (CWANA), as well as from ICARDA and CIMMYT. They reviewed and assessed the progress of winter wheat breeding programs and sustainable winter wheat production in the harsh cold climatic conditions of CWANA. The participants from the CAC Region included two researchers from ICARDA-CAC, one each from Uzbekistan, Azerbaijan, Georgia and Kazakhstan and two from Tajikistan. The participants from the CAC presented country papers as well as an overview of winter wheat improvement in the Region. The deliberations were held on constraints, opportunities and future regional efforts towards winter wheat improvement. The participants made recommendations on ways to address research priorities and improve winter wheat improvement in CWANA.

Drs. Zakir Khalikulov and Ram Sharma, ICARDA-CAC

Seven participants (seen in front) from the CAC Region in the 1st Regional Winter Wheat Symposium
(Photo by Ram Sharma)

International conference on the pastures of Tajikistan held in Dushanbe

International conference "The pastures of Tajikistan: challenges and perspectives" took place on 28-30 June 2011 in Dushanbe, Tajikistan. Over 140 participants from different countries, companies, NGOs, leading agricultural centers and research institutions of the Academy of Sciences of Tajikistan, Ministry of Agriculture of Tajikistan, Tajik Academy of Agricultural Sciences, higher educational institutions, enterprises and departments affiliated with sectoral ministries and departments of Tajikistan attended this event. The Conference was organized to contribute to the development of national strategies for sustainable pastures, arable and forest lands evaluation, monitoring and management. An integrated policy, legal, and institutional framework for applying sustainable rangelands resources in different agro-ecological landscapes of Tajikistan were discussed.

A special session was dedicated to desert and semidesert pastures of Central Asia, which are most productive, but sensitive ecosystems to climate change, wind erosion, salinization, and consequently loss of biodiversity. The presentation of Dr Kristina Toderich, representative of ICBA (International Center for Biosaline Agriculture) in CAC on "Integrated Management of Desert Rangelands to Improve Food Security and Sustain the Natural Resource Base in Uzbekistan" generated considerable interest among audience. It was dedicated to current spatial and temporal status of pastures vegetation, introduction of best practices and technologies for restoration and rehabilitation of degraded rangelands and conservation of its unique agrobiodiversity in order to ensure environmental sustainability and better livelihoods of agropastoral communities.

Collaborative Book titled "Rangeland stewardship in Central Asia: Improved livelihoods, Biodiversity Conservation and Land Protection" supported by Springer Verlag Publishers and edited by Victor R. Squires, International Dryland Management Consultant, will be prepared as an outcome of this International Conference. One Chapter of this book will be prepared by Dr Kristina Toderich and co-partners from the Region.

Dr Kristina Toderich, ICBA-CAC

Plenary session of the International Conference, 28 June, Dushanbe, Tajikistan
(Photo by Ms. Lilia Tverdin)

Research strategies on underutilized vegetable crops in Central Asia and the Caucasus presented at International Symposium in Malaysia

Dr. Ravza Mavlyanova, Regional Coordinator of AVRDC-CAC office in Tashkent, participated in the 2nd International Symposium on Underutilized Plant Species entitled

Presentation by Dr. Ravza Mavlyanova
(Photo by Mr. Niranjana Murthy)

"Crops for the Future – Beyond Food Security" held in Kuala Lumpur, Malaysia, from 27 June to 1 July 2011, where she made a presentation on "Strategic Approaches for Research and Promotion of Underutilized Vegetable Crops for Food Security in Central Asia and the Caucasus".

The Symposium is organized under the auspices of the International Society for Horticultural Science (ISHS) with support from the ISHS Working Group on Underutilized Plant Genetic Resources, the ISHS Commission on Plant Genetic Resources and the ISHS Section on Tropical and Sub-Tropical Fruits. The symposium was co-convened and supported by the University of Nottingham Malaysia Campus, Crops for the Future, Bioversity International, the British Council and the Malaysian Agricultural Research and Development Institute.

The symposium emphasized the potential role of underutilized plant species to contribute to global food security and nutrition, buffering against the consequences of climate change and increasing agricultural biodiversity.

The event was organized around five main areas that, altogether, will identify approaches and methodologies used in research for the development of underutilized plant species. Participants were invited to share and discuss strategies that aim at maximizing knowledge acquisition, minimizing duplication of efforts and identifying priority areas for further research and development.

More then 200 participants from around the world participated on this Symposium. Recommendations of the Symposium were elaborated for further development of the activity on underutilized species in the world.

WORKSHOPS AND TRAININGS

Regional training workshop "Plant Genetic Resources Management and Germplasm Characterization"

Participants characterizing wheat seedling during the training
(Photo by Dr. Ram Sharma)

The training workshop on "Plant Genetic Resources (PGR) Management and Germplasm Characterization" for the Caucasus countries was held in Tbilisi, Georgia from 4-9 April 2011. The training event was organized and supported by ICARDA's Regional Office for Central Asia and the Caucasus.

Twenty researchers and genebank specialists from Georgia, Armenia and Azerbaijan participated in the training workshop. The workshop was opened by Acad. Guram Aleksidze, Vice-President of Georgian Academy of Agricultural Sciences and National PGR Coordinator for Georgia and Dr. Zeynal Akparov, Director of Azerbaijan Genetic Resources Institute and Regional PGR Coordinator. They extended a warm welcome to all the participants and thanked the organizers for having selected Tbilisi as a venue of the regional training workshop. Dr. Aleksidze also set his hopes on the training that would provide opportunities for strengthening linkages among the PGR scientists in the three Caucasus countries.

The training consisted of several technical sessions, including on history of plant genetic resources in the Caucasus, new developments on PGR research and strengthening research collaboration, as well as round table discussions. During the first and second technical sessions, representatives from Georgia, Armenia and Azerbaijan presented their reports, highlighting the problems, challenges and promising results in PGR research and development.

During the third technical session, presentations were made on PGR Database management and information about PGR web site. A separate session was dedicated to discussing policy and legal frameworks for effective management of PGR.

The participants visited the national Gene Bank near Tbilisi, where they shared practical experiences with ex situ conservation activities. Dr. Ram Sharma, senior scientist and resource person from the ICARDA-CAC Regional Office, presented and led the session on germplasm characterization and data analysis.

During the last session, a round table discussion on current topics of interest for the growth of PGR activities was organized. The discussions were chaired by Dr. Guram Aleksidze and co-chaired by Dr. Zakir Khalikulov. The topics chosen were: information and germplasm exchange, modes of collaboration amongst CAC countries and preparation of proposals for new research activities on PGR in the Region.

Several participants from Georgian Agrarian University in Tbilisi attended the workshop. Owing to the recent institutional reform of agricultural research and education in Georgia, the University plays a key role in enhancing agricultural research in Georgia, including PGR and germplasm enhancement activities.

The participants generally agreed that the areas chosen for discussions are all vital issues for PGR activities in their respective countries. The drafts of three proposals were prepared.

In the concluding remarks, Dr. Guram Aleksidze stated that the training was very successful one and expressed his expectation for future strengthened cooperation in this area in the Caucasus.

Drs. Zakir Khalikulov and Ram Sharma, ICARDA-CAC

Regional workshop on "Socio-economic aspects of agrobiodiversity conservation"

Regional Workshop on "Socio-economic aspects of agrobiodiversity conservation" was organized within Bioversity International/UNEP-GEF Project "In situ/on farm conservation and use of agrobiodiversity (horticultural crops and fruit crops) in Central Asia" on 13-15 April, 2011 in Tashkent, Uzbekistan. Nineteen key partners from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan participated in the workshop, instructed by Mauricio Bellon, director of Diversity for Livelihoods programme, Bioversity International.

The objectives of the workshop were: discussion of constrains faced during the survey, introduction of results of preliminary analysis of socio-economic baseline, development of questionnaire for collection data necessary for analysis. Preliminary results of data analysis, collected during the base survey were demonstrated to the participants. The presentation emphasized the importance of implemented activities for conservation and management of diversity of local varieties of target crops in orchards, households and natural forests, as well as for improving the wellbeing of farmers and forest dwellers, maintaining and managing these varieties and crops.

Participants were provided for review and consideration detailed reports on preliminary results of base survey in each country, developed by researchers of Bioversity International, and were asked to discuss and agree on the latest changes and amendments to the questionnaire. All comments and suggestions made by the participants from the five project countries were taken into consideration and included to the draft of a new questionnaire.

Ms. Muhabbat Turdieva, Bioversity International, Tashkent

Focus on Women: Improving Local Artisan Industries

A series of training events were organized within the framework of joint IFAD-ICARDA grant project "Improving Livelihoods of Smallholders and Rural Women through Value-Added Processing and Export of Cashmere, Wool and Mohair" in four villages of Naryn province of Kyrgyzstan from April to June 2011. The major purpose of these training events was to improve skills of local artisan women in designing, producing, and marketing of silk, felt and woolen items such as scarves, slippers and chair-mats. Training sessions consisted of practical exercises, which were mainly focusing on:

- elaboration of templates for product models;
- silk and wool dyeing techniques;
- launching, operating and maintaining wool carding and felting machine;
- implementation of export orders.

About 55 participants, all artisan women, attended these events. Trainers Mrs. Kenjekan Toktosunova and Mrs. Kulbar Toksombaeva, experienced artisans, as well as Mrs. Elvira Abdyldaeva, a young designer from internationally known Studio of Tatiana Vorotnikova, instructed at the training. During the evaluation sessions the participants and trainers discussed and assessed product samples made during the practical exercises, including shortcomings and ways to improve product quality to meet the export requirements.

Moreover, the group leaders and successful artisans, who had demonstrated good understanding and creative activeness at the trainings, 12 persons in total, were offered the fellowship in Bishkek. The purpose of the fellowship is to provide the opportunities for in-depth practical studies improving the professional skills and knowledge received at theoretical

Study of wool carding machine in Lahol village
(Photo by Svetlana Balalaeva)

trainings. Felt slippers and felt scarves were chosen as the main theme of the fellowship.

Designer Mrs. Olga Potapenko, who graduated from the Leningrad Technological Institute, Faculty of Footwear Design and Technology, was invited for implementation of the fellowship program on slippers production. She had prepared in advance samples of templates for different sizes of slippers according to the model recommended by Dr. Liba Brent, Principal Investigator of the Project.

The implementation of the joint IFAD-ICARDA project is envisaged until 2013 and a number of similar events are planned to be held in other areas of Central Asia.

Ms. Svetlana Balalaeva, «CACSARC-kg» Public Foundation, and Nariman Nishanov, ICARDA-CAC

International Winter Wheat Traveling Seminar

Participants of the IWWIP traveling seminar from the CAC Region
(Photo by Dr. Ram Sharma)

International Winter Wheat Improvement Program (IWWIP), a joint program between Ministry of Agriculture and Rural Affairs of Turkey, CIMMYT and ICARDA to develop new winter and facultative germplasm for Central and West Asia (www.iwwip.org), organized a traveling seminar from 30 May to 4 June 2011.

Forty-six wheat researchers from 17 countries participated in the seminar that took place in Turkey, Bulgaria and Romania. From among the CAC countries, there were participants from Azerbaijan (2), Georgia (1), Kazakhstan (2), Tajikistan (1) and Uzbekistan (2). Dr. Ram Sharma and Dr. Zakir Khalikulov from ICARDA-CAC participated in the event. The participants visited research institutions in Turkey (Trakya Agricultural Research Institute, Edirne), Bulgaria (Institute of Plant Genetic Resources, Sadovo and Dobrudzha Agricultural Institute, General Toshevo) and Romania (National Agricultural Research and Development Institute, Fundulea).

The group was briefed about winter wheat improvement activities at each institution, which was followed by visit to the research fields. Also, a half-day seminar was organized to discuss IWWIP ongoing activities and its regional and international collaborations.

Dr. Ram Sharma, ICARDA-CAC, Tashkent

Training on vegetable crops in Bostanlyk region

Training on vegetable crops in Bostanlyk, Uzbekistan
(Photo by Nigora Shofayzieva)

Training on vegetable crops cultivation for healthy and diversified diet was conducted in the piedmont region of Bostanlyk, Uzbekistan on 2 June 2011 as part of AVRDC-CAC office collaboration with the Tashkent State Agrarian University, Bostanlyk agrarian college and Khokimiyats [local governments] of the Tashkent region and Bostanlyk district. Two years ago AVRDC established a school garden with the purpose of teaching pupils and local population to cultivate various vegetable crops and to improve diet through introduction into the college kitchen of nutrient vegetables. A number of vegetable food recipes were elaborated by AVRDC-CAC office in collaboration with national partners, including vegetable soybean (15), leafy cabbage (20), bean (18) and daikon (16) recipes for popularization of healthy diet among the population.

The training was attended by 20 participants, including 16 women. Presentations on AVRDC new varieties and cultural practices in the specific mountain area, as well as nutrient value and cooking methods were presented to participants, followed by practical field exercises. All trainees received seed kits with information booklets of 7 early maturing new varieties of various vegetable crops for cultivation in household plots and farmers' fields. Further dissemination of useful information and multiplied vegetable seeds will promote food security and a healthy diet for the population living in mountainous areas of Uzbekistan.

Dr. Ravza Mavlyanova, AVRDC – CAC

Regional Workshop on "Public Awareness"

Regional Workshop on "Public Awareness" was organized within Bioversity International/UNEP-GEF Project "In Situ/On Farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia" on 6-8 June 2011 in Tashkent, Uzbekistan. Fifteen representatives of key project partners from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan participated in the workshop. Mr. Rami Khalil, project consultant on Public Awareness, was guest instructor at the workshop. Mrs. Muhabbat Turdieva, Regional Project Coordinator, also instructed at the workshop.

Representatives of National Project Implementation Units briefed participants on

implemented Public Awareness activities at national levels, as well as on problems and constrains faced during the implementation of these activities. Participants presented Public Awareness materials, developed by countries. Particularly, a video film "Hanging Gardens of Pamir", developed by national project implementation unit in Tajikistan, was demonstrated and received participants' attention.

Mr. Rami Khalil addressed the role of Public Awareness in conservation of agricultural biodiversity. He noted that the main objective of this project component is to change public attitude to local forms and landraces of fruit varieties. To achieve this goal, the project implementing staff can use different innovative methods and instruments (agro-tourism, post stamps, etc.). Participants discussed the possibility of improving the project activities in this area, and in particular, the need for continuation of Public Awareness activities after the project completion was raised. As a result of the discussion, list of recommendations was developed; deadlines and responsible people for implementing these recommendations were identified.

On the final day, participants visited the project plots, established in Sidzhak forestry of Bruchmulla forestry enterprise, Tashkent region.

Ms. Muhabbat Turdieva, Bioversity International, Tashkent

Field trip to Sidzhak
(Photo by Mr. Rashid Azimov)

Integrated Pest Management workshop held in Tajikistan

A workshop on Integrated Pest Management (IPM) Programs for Central Asia was held on 6-11 June 2011 in Dushanbe, Tajikistan. The workshop was supported by the IPM Collaborative Research Support Program (USAID), in coordination with collaborators from Michigan State University (USA) and plant protection researchers from ICARDA-CAC. About 100 specialists from Central Asia attended this workshop.

The workshop aimed at analyzing the implementation of project activities, discussion of the further measures for effective research coordination, as well as ways for identification pests and diseases in agricultural crops. The program consisted of several sessions, including lectures in various auditoriums.

Twenty-six plant protection specialists (10 men and 16 women) from Central Asia and students of National University of Tajikistan, where the event took place, had an opportunity to learn about identification of pests and diseases in various crops, including application of IPM strategies on wheat, potato and tomato fields. They discussed the ways of rational use of pesticides, producing of healthy food and reducing production costs, with a particular emphasis on the role of biological control of pest organisms and selection of resistant stocks of crops and introducing grafting methods.

Lecture in Tajikistan National University during the seminar
(Photo by Dr. Ravza Mavlyanova)

During the last day of the workshop it was concluded that research on IPM for wheat, tomato and potato crops should include virus diseases control measures in Tajikistan, Kyrgyzstan and Uzbekistan. The need for introducing more educational programs for students and farmers was also highlighted during the workshop.

Dr. Barno Tashpulatova, ICARDA-CAC and Dr. Ravza Mavlyanova, AVRDC-CAC

Traveling Seminar on Breeding, Plant Genetic Resources, and Biotechnology in South-East, South and South-West Kazakhstan

During the period 6-14 June 2011, CIMMYT organized a Traveling Seminar on Breeding, Plant Genetic Resources (PGR) and Biotechnology for a group of 24 national specialists from different institutions and regions. The seminar with the route of 1400 km in length covered South-East, South, and South-West Kazakhstan. The main objective of the seminar was to evaluate the status and prospects of development of breeding, biotechnology and PGR in the Region, as well as to promote the ideas of innovative technologies. The traveling group visited farms and all main agricultural research organizations in the Region: Institute of Plant Biology and Biotechnology, Kazakh ARI on Farming and Crop Production, Krasnovodopad Agricultural Experimental Station, South-West Agricultural Research Center for Livestock and Crop Production, Kazakh ARI on Rice Production.

Seminar participants unanimously agreed that one of the most important tasks today is to increase crop yields through development of new varieties, mobilization of PGR and use of advanced biotechnologies. The only obstacle is the weak link between biotechnology, breeding and PGR in the country. In comparison with other countries in

In the breeding fields of Krasnovodopad Agricultural Experimental Station, South Kazakhstan province, 8 June, 2011.
(Photo by Arman Baitassov)

Central Asia, Kazakhstan has a well developed biotechnology, breeding and extensive collections of plants. However, to date, studies are conducted in parallel, without the close interaction between breeders and biotechnologists. In most cases, biotechnology methods and developments remain within the laboratories. Breeders practically do not apply biotechnology tools in the breeding process. The application of biotechnology and molecular biology methods to study, characterize and use PGR for breeding is in rudimentary stage. Increasing the productivity of plants and improving their agronomic and economically valuable traits are associated with fundamentally new approaches that are based on the methods of cell and molecular biology, physiology, biochemistry, genetics and other areas of modern biology, which allow significant acceleration of the breeding process.

For the agriculture of Kazakhstan, which is referred to the area of risk farming, biotechnology approaches can play an increasingly important role in the breeding process. When creating a supportive infrastructure for agriculture, biotechnology can be a powerful tool in the breeding of high-yielding stresses tolerant crop varieties.

Prof. Murat Karabayev, CIMMYT-Kazakhstan, Astana

Regional Training Workshop on application of molecular markers in assessment of plant diversity held in Tashkent

Practical exercise at laboratory of the Regional Training Centre for Molecular Markers in Tashkent
(Photo by Ms. Feruza Rufieva)

Regional Training Workshop "Application of molecular markers technologies in assessment of the diversity of plant genetic resources", organized within Bioversity International/UNEP-GEF Project "In Situ/On Farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia" took place on 13 -17 June 2011 in the Regional Training Centre for Molecular Markers, established at the Center of Genomic Technologies of the Research Institute of Genetics and Experimental Biology of Plants, Academy of Sciences of Uzbekistan.

The Center of Genomic Technologies is one of the leading laboratories in this area, not only in Uzbekistan but also in Central Asia. It conducts research at molecular genetic level to study the potential of genetic resources in enhancing the economically valuable traits in major agricultural crops. Twenty-three representatives of Central Asian countries, involved in project implementation, participated in the workshop. They were instructed by the Centre director, Dr Abdyrakhmonov and other specialists of the Center.

During the workshop, participants became familiar with fundamentals and methodology of molecular genetics, as well as its role in the study of biological systems. Instructors conducted training on DNA sequencing, analysis of nucleotide sequences, qualitative and quantitative analysis of DNA, and methods of DNA extraction from biological materials. Besides, important information on molecular markers types (RFLP, AFLP, RADP, SSR, EST, etc.), computer programs for genomic material analysis, statistical analysis, QTL (Quantitative Trait Locus) and LD (Linkage Disequilibrium) analysis, and on bioinformatics Internet resources was presented. Participants exercised their acquired skills on sequencing, biological material preparation, DNA extraction from bacterial cells and plants, electrophoretic analysis of extracted DNA in agarous gel, acceptance of polymerase chain reaction (PCR) on extracted DNA and analysis of PCR products.

At the end of the workshop all participants were awarded certificates of successful completion of the course on application of molecular markers technologies in assessment the diversity of PGR.

Ms. Muhabbat Turdieva, Bioversity International, Tashkent

Training course on application of modern conventional tools in Plant Genetic Resources characterization, pre-breeding and breeding

Dr. Ram Sharma, Breeder at ICARDA-CAC, provided a training course on "Application of modern conventional tools in Plant Genetic Resources (PGR) characterization, pre-breeding and breeding", which was jointly organized by FAO, CIMMYT and Azerbaijan Genetic Research Institute (AGRI). This training course was organized from 17 to 21 June 2011 at AGRI facilities in Baku, Azerbaijan. The purpose of the training course was to

enhance the scientific capacity of a group of scientists to use modern and conventional tools used in PGR characterization, pre-breeding and breeding. While the state of the art of tools available on the subject was discussed, emphasis was given on practical aspects which could be utilized by the participants in their research. Twenty-one participants, mostly young researchers from different research institutions in Azerbaijan attended the training course. The course was delivered through lectures, handouts, PowerPoint presentations, online resources, practical exercises, data collection in the research plots, as well as the use of statistical softwares in designing experiments and data analysis.

Dr. Ram Sharma, ICARDA-CAC, Tashkent

Training participants collecting data in wheat experimental plots
(Photo by Dr. Ram Sharma)

Regional Training Workshop on Agrobiodiversity Level Assessment

A Regional Training Workshop on Agrobiodiversity Level Assessment was organized within Bioversity International/UNEP-GEF Project "In Situ/On Farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia" on 27-29 June 2011 in Tashkent. Twenty representatives of research institutions and scientific staff, working on collection and analysis of data on agrobiodiversity level within the project, participated in the workshop. Mrs. Devra Jarvis, Senior Scientist of Diversity for Livelihoods Programme, Bioversity International, and Mrs. Muhabbat Turdieva, Regional Coordinator of project instructed the workshop. Besides, Mrs. Judith Loo, Senior Scientist at Understanding and Management of Biodiversity Programme, Bioversity International, attended the workshop.

During the workshop, participants discussed the issue of evaluating the size of population of horticulture resources in natural ecosystems, analyzed available data on the use of wild material (direct use vs. use for grafting), analyzed data on systems for providing seedling materials, linking access to seeds with diversity on-farm, reviewed and discussed conservation management methods for wild ecosystems diversity on-farm, linking management practices with diversity, reviewed existing data on agrobiodiversity assessment from previous workshop and discussed different production systems (household vs. orchard). Besides, the participants discussed the state of research articles for a special issue of journal "PGR: Characterization and Evaluation"

Ms. Muhabbat Turdieva, Bioversity International, Tashkent

Participants of the regional training workshop on agrobiodiversity level assessment
(Photo by Mr. Gregoriy Ayzhenshtat)

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