REGIONAL PROGRAM FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN CENTRAL ASIA AND THE CAUCASUS

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Bracing for climate change in Central Asia

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Adoption of technologies like raised-bed planting is one way to tackle challenges associated with climate change. Raised-bed planting helps to save water and increase yields. Some farmers in Uzbekistan, for example, already use this technology to grow soya bean. Photo by Aziz Nurbekov.

Impact of climate change is not a distant prospect in Central Asia, a region of mostly arid and semi-arid lands. Some countries already report that weather variability causes damage to agriculture. Agricultural production is at risk particularly from sporadic droughts and water shortages. According to FAO, extended dry weather conditions in the northern parts of Kyrgyzstan in 2014 affected wheat production and raised serious concerns over the country's food supply (see here). However, Kyrgyzstan suffered from similar droughts in 2008 and 2012 when wheat yields fell to 1.94 and 1.68 tons per hectare respectively.

As the Central Asian countries share not only borders and climatic conditions, but also concerns and constraints, they appreciate the need for closer cooperation in tackling challenges linked to climate change. Successful approaches and strategies in one country could also work in another. So the countries are expanding collaboration between themselves and with international research and development organizations on issues ranging from water use efficiency to knowledge sharing on sustainable land management practices. They are working to align national strategies with regional priorities. Reinforcing regional synergies in addressing climate change would create extra value and benefit all countries.

Water management, for example, is one important area where greater collaboration is needed. A reduction in water availability is predicted to occur along with an increasing demand for irrigation water of about 30 per cent in a 4 C warmer world. The region is likely to experience more intense warming than the global average: in a 4 C warmer world, the mean annual temperature over Central Asia could be by 3 C higher than the global mean. Combined with increased heat extremes that negatively affect crop productivity, substantial risks for irrigated and rainfed agricultural systems can be expected (see here). In May 2014, the World Bank convened the 2nd Central Asia Climate Knowledge Forum in Almaty, Kazakhstan. It concluded with a call from all five Central Asian countries for a regional program on climate resilience to strengthen climate-smart information, institutions and capacity for multi-sector and cross-country planning, investment preparation and implementation, so as to increase regional collaboration in the long term.

In July 2014, around 185 policymakers and researchers from the Central Asian countries, as well as representatives from international organizations and Mongolia, gathered in Dushanbe, Tajikistan, for the Central Asian Sub-regional Conference in the run-up to the 7th World Water Forum scheduled for 2015 in South Korea. During the two-day event, they worked to formulate and agree on a sub-regional agenda on water (see here).

Knowledge transfer is another priority. And events like the policy stakeholders conference on 'European Union - Central Asia science technology & innovation cooperation in addressing climate change', held in Bishkek, Kyrgyzstan, in September 2014, serve as effective platforms for promoting best practices and latest innovations (see here). More than 145 policymakers, international donors and researchers from the European Union and Central Asia exchanged views on regional and international science, technology and innovation policies, research programs and projects addressing climate change. The conference was aimed at increasing synergies among these stakeholders and helping to shape future collaborative initiatives addressing climate change between the EU and Central Asian countries.

In 2014 the World Bank designed a regional 'Climate Change Adaptation and Mitigation Program for Central Asia (CAMP4CA)'. To identify synergies with climate-related activities supported by the development community in Central Asia, a round-table consultation was held in Almaty in February 2015. Representatives from the development community, including the CGIAR Regional Program for Central Asia and the Caucasus, provided feedback on 'Regional Climate Knowledge Services' and 'Regional Climate Investment Facility', the two key components of the new initiative. CAMP4CA aims to enhance regional coordination and access to improved climate change knowledge services for key stakeholders, and support the integrated development of climate-smart investments and capacity building for climate vulnerable communities in the Central Asian countries.

Improving knowledge management and capacity building in the region has been the focus of efforts by a knowledge-sharing project under the Central Asian Countries Initiative for Land Management (CACILM) since 2013 (see here). To streamline the use and creation of knowledge on sustainable land management (SLM) in Central Asia and, most importantly, to link research in the lab with action in the field, scientists from the CGIAR

Regional Program closely cooperate with local research counterparts, policymakers and farmers. They work together to enhance knowledge on SLM practices in the region, and tailor this knowledge to the needs of local populations and authorities for practical use and the shaping of better informed policies. For the past two years, the CACILM project has been gathering and synthesizing knowledge in the region and promoting best practices through workshops, training sessions and field days for farmers and scientists. As a result, technologies like raised-bed planting and no-till are attracting more and more attention from farmers. For example, during a field day in June 2014, farmers in Kyrgyzstan learnt about how raised-bed planting could help them save and earn more. It is a proven farming practice that offers the promise of water savings and increased yields. During another field day in July 2014, no-till technology was shown to farmers in Kashkadarya Region, Uzbekistan (watch here). Farmers saw no-till technology at work and learnt how they would benefit from using it in rainfed areas. This project is funded by the International Fund for Agricultural Development (IFAD) and coordinated by the International Center for Agricultural Research in the Dry Areas (ICARDA), a member of the CGIAR Regional Program and the lead center for the Dryland Systems program.

More and more farmers are also engaged in experiments. On-farm trials help researchers to test technologies in the field and farmers see them work in real conditions. In an experiment in 2014, a group of scientists from the International Water Management Institute (IMWI) and AVRDC - The World Vegetable Center, two members of the Dryland Systems program and the CGIAR Regional Program, demonstrated how double cropping could improve water use efficiency in the Fergana Valley. Double cropping is an effective way of converting evaporation losses from fallow land into useful crop transpiration. This may result in improved water use efficiency, enhanced food security and increased income for farmers. A farmer, who took part in the experiment, planted mung bean after winter wheat in mid-June and made a net profit of 1,000 USD per ha. In another experiment, a team of researchers from ICARDA, the US Department of Agriculture and the Scientific-Information Center of the Interstate Coordination Water Commission of Central Asia (SIC-ICWC) found that using evapotranspiration-based (ET) irrigation scheduling to grow cotton in the Fergana Valley also helps to improve water use efficiency (see here). The ET-based irrigation scheduling method has potential for replacing subjective daily water management decisions and thus improving water use efficiency while reducing salinity and waterlogging.

The centers' researchers also help to enhance skills and knowledge of farmers and young scientists in the region. For example, during a one-day training course in Tajikistan in October 2014, 75 local farmers, seed producers, water users and researchers learnt about the principles of quality wheat seed production and how improved, stress-tolerant crop varieties could contribute to food security. What is more, farmers were given 12 tons of seed of two improved wheat varieties and one ton of seed of an improved barley variety for seed multiplication. Under the Dryland Systems program, scientists also exchange knowledge and experience with local counterparts. In September 2014, a team from ICARDA, AVRDC and the International Potato Center CIP organized a training course on scientific management of field experiments in Tashkent, Uzbekistan, for around 22 young scientists from national research institutions in Uzbekistan. The course focused on the principles and practices in designing, managing and data collection of field crop experiments. Another training course on statistical design and data analysis of field

experiments, organized by ICARDA in Tashkent in December 2014, brought together 12 young scientists from Uzbekistan, Azerbaijan and Georgia. The young scientists were briefed on statistical concepts and methodologies for designing field experiments and biometrical techniques applied in agricultural research.

All this work is aimed at preparing, above all, researchers, farmers and rural populations for the anticipated consequences of climate change. But taking action in the field in one country is not enough. Regional collaboration is needed. Joint initiatives on knowledge transfer would benefit all countries. Farmers are often enthusiastic learners. With a little government support, they could become early adopters of best practices and improved technologies.