



New initiative of World Bank – Reducing Vulnerability to Climate Change in Agricultural Systems Developing Adaptation and Mitigation Strategies

The World Bank initiated implementation of a new Regional Analytical and Advisory Activities (AAA) Program in the South Caucasus countries – on Developing Climate Change Adaptation and Mitigation Strategies in the Agricultural Sector for Armenia, Azerbaijan, and Georgia. The program aims to assess the potential impacts of climate change on the agricultural sectors in the South Caucasus countries, and identify strategies for climate change adaptation and mitigation measures to increase the climate resilience of the agricultural systems while maximizing co-benefits for sustainable development. The overall aim is to increase the ability of the South Caucasus countries in mainstreaming climate adaptation and mitigation into sector-specific agricultural policies, programs and investments.

On the first stage of the project, research is carried out to assess potential climate change risks on agricultural sector. The research is conducted by Industrial Economics (IEC), State University of Oregon, Future Water, Massachusetts Institute of Technology. REC Caucasus is the project partner at the regional level.

Final outcome of the research will be the menu of adaptation measures for crop and livestock, which shall be prepared by beginning of 2013.

The Country notes have been developed by World Bank experts on potential impacts of climate change for three South Caucasus countries and presented to stakeholders for discussion. In March and April, national consultation meetings have been conducted with the Ministries of Agriculture and Environment Protection, as well as other relevant governmental entities, NGOs and academic sector in all three countries. The national meetings encouraged cooperation between different sectors, as well as information and experience sharing. Through close cooperation with the Ministry of Agriculture, specific approaches to further project implementation have been outlined.

Within the framework of the project, the Regional Environmental Centre for the Caucasus organized World Bank consultation meetings with local farmers in Armenia, Azerbaijan and Georgia in March and April. The aim of the meetings was to determine main problems in agriculture sectors caused by climate change impacts, in order to conduct further in-depth researches in pilot regions. Overall 61 farmers from Ararat and Vayots Dzor regions (Armenia), Shamakhi, Gobustan and Agsu districts (Azerbaijan) and Kakheti region (Georgia) have participated in consultative meetings.

The World Bank experts and representatives of the Regional Environmental Centre for the Caucasus provided farmers with information regarding potential impact of extreme weather conditions on agriculture and livestock and presented examples of adaptation measures practiced in Oregon (USA). Farmers discussed main agricultural issues and approaches, change of climate parameters, observed in past 10 years, and consequences of negative impacts. They also discussed mitigation measures, which are adopted by farmers. Despite representing different communities and countries, farmers reported similar challenges and concerns, such as decrease in harvesting, crop destruction, due to extreme climate conditions (prolong droughts and freezing in Spring), intense spreading of agricultural pests, crop sales issues, expensive irrigation, absence of insurance and inaccessibility to agricultural credits. As for remedies, farmers consider importance of introduction of modern agricultural practices and technologies, such as dripping irrigation systems, new approaches for soil treatment, substitution of wide-spread species with more resistant varieties, and restoration of wind belt and irrigation systems.

The information provided by farmers will be analysed and used for finalization of the research. Results will be discussed with stakeholders, in order to ensure introduction of adaptation measures by taking into account existing condition in three South Caucasus countries.



AGRICULTURAL BIODIVERSITY AND CLIMATE CHANGE PROJECT

1 MAY

2012

№2



giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

BMZ Federal Ministry for Economic Cooperation and Development



IN FOCUS

- ▶ The Regional Conference – Climate Change Risks in national policies and legislations in the South Caucasus countries
- ▶ Institutional Analysis and Potential Assessment
- ▶ Agrobiodiversity Inventory and Assessment in arid and semi-arid ecosystems of South Caucasus
- ▶ New initiative of World Bank – Reducing Vulnerability to Climate Change in Agricultural Systems Developing Adaptation and Mitigation Strategies



The Regional Conference – Climate Change Risks in national policies and legislations in the South Caucasus countries

On 24-25 February 2012, the regional conference, dedicated to discussing policies and legislations which reflect climate change risks, and adoption of relevant recommendations at the regional level, was organized in Tbilisi, Georgia. Participants of the conference included representatives of Armenian, Azerbaijan and Georgian Parliaments, Ministries of Environment and Agriculture, as well as project experts and national coordinators. The attendees greeted representative of EU delegation to Georgia – Juan Echanove.

At the conference, the project experts presented outcomes of national policies and legislation analysis, in the framework of agrobiodiversity conservation and climate change risk reflection. The first working version of the regional report was also presented, which analyzes international obligations of South Caucasus countries, identifies common issues of the region, basic challenges and shortcomings, as well as analyzes the best international practices.

The following common issues in biodiversity conservation, agriculture and food safety fields at the regional level have been identified:

- All three countries have ratified basic international agreements regarding agro-biodiversity conservation and climate change issues, except the international agreement on Plant Genetic Resources for Agriculture, the only party of which is Armenia.
- Biodiversity related policies and strategies are in place in all three countries and include issues regarding agrobiodiversity conservation. However mitigation or adaptation measures to climate change impact are not identified by these documents.
- Climate change adaptation strategies are included in Second National Communications to the UNFCCC of all three countries. However no specific adaptation measures dealing with conservation and sustainable use of agro-biodiversity in light of climate change are included in the documents.
- The sectorial policies for agricultural development are adopted in all three countries as well. Climate change risks are not assessed by and adaptation issues are not incorporated in the aforementioned documents.



After the two-day contribution of participants, the first working version of recommendations has been developed, as well as possibilities for its implementation was discussed. The representatives of government sector and experts agreed upon necessity of capacity building for including climate change adaptation issues in sectorial development programmes and strategies.

Within the framework of the project, parallel works must be conducted in order to adequately reflect topics on agrobiodiversity conservation and climate change impact in all relevant strategic documents, which are currently being developed, either reviewed in the countries.

The newsletter has been prepared with the financial assistance of the European Union. The content of this publication is sole responsibility of REC Caucasus and can under no circumstances be regarded as reflecting the position of the European Union.



For elaboration and implementation of effective climate change adaptation measures, it is important to ensure involvement of all possible sectors and relevant stakeholders. Therefore, one of the project's aim is promote individual and institutional capacity building in this regard.

On the first stage of the project, existing institutional resources were analyzed at national and local levels. The national experts in three countries assessed the capacity of local bodies in agrobiodiversity conservation and planning of climate change adaptation measures and development strategies, in terms of reflecting these issues. Based on assessments made at national and regional department levels, recommendations were elaborated on further development opportunities, to improve management system and establish financial mechanisms, for improving skills of public servants and strengthening cooperation between central and local governmental bodies.

Outcomes of institutional analysis and recommendations were discussed at workshops, organized in February of the on-going year in three countries. All the government representatives, responsible for climate change, biodiversity conservation, agriculture, regional planning and economic

development issues attended the meetings.

Based on the results of researches conducted in three countries at local and national levels, it was revealed that, for adequate integration of climate change and agrobiodiversity issues in policy documents, existing institutional potential requires significant development. Practically no governmental agency is responsible for agrobiodiversity protection and preservation, as well as no department has direct connection with climate change adaptation measures in Georgia. The problem is lack of qualified employees and their turnover. Another problem in the management system is poor sectorial cooperation and exchange of information, which prevents from inclusion of agrobiodiversity conservation and climate change adaptation measures in sectors development policies and action plans. Financing scientific studies in this regard is also unstable, therefore there is scarcity of scientific knowledge on negative impact of climate change on agrobiodiversity.

The outcomes of the study will be taken into account by decision-makers and local authorities while developing study modules and planning trainings, which are planned for September of the current year.

Agrobiodiversity Inventory and Assessment in arid and semi-arid ecosystems of South Caucasus

Within the framework of the project in Armenia, Azerbaijan and Georgia, assessment of floristic complexes in selected arid and semi-arid regions, as well as inventory of agricultural species was finalized. Based on field visits and literature analysis, change in composition of basic agricultural crops experienced in past 50-70 years was also assessed. The most vulnerable plant communities were identified, with endemic and endangered species in arid and semi-arid zones. Condition of wild relatives of crops was also evaluated.



Within the framework of the project, in order to assess agrobiodiversity in **Armenia**, field expeditions were organized in natural ecosystems and agricultural plots near 7 pilot rural communities in Ararat and Vayots Dzor regions. Strong winds, as well as snow during blooming periods of fruit trees, especially apricot and pollination had been noted in past 10-15 years, which negatively affect the leading agricultural sectors. Active erosion takes place in both regions. Currently, 56,2 % of Ararat lands and 31 % of Vayots Dzor is eroded.

After land privatization in 1990-2000s, significant reduction in humus layer was noted. The majority of soils is degraded and infertile. Due to poor management of mowing periods and intensive grazing, the natural vegetation cover was replaced with low food value and invasive species. The population is intensively consuming widespread wild food plants, including Salsify, Zosima, Sorrel, Black salsify, Mallow, Plum, Ararat Wheat, Asparagus.

After floristic assessments and data analysis, following vulnerable semi-arid floristic communities have been identified: semi-desert dominated by absinth near Paruyr Sevak community, *Onobrychis comuta* community near Zangakatun community area and floristic complex of wild crops in Aghavnadzor and Rind communities.



In **Azerbaijan**, in three selected pilot areas within the framework of the project (Shamakha, Agsu and Gobustan), agriculture is the main source of income for local population. In agricultural sector, there is developed crops growing, viticulture and fruit-growing, as well as cattle-breeding partially, poultry raising and apiculture. Cotton is grown on lowland valleys of Agsu area. Viticulture was also developed in Shamakh district in 1970-85s, however renovation of this sector was started only after 2000.

Climate and soil conditions contribute to diversity in agricultural species in the region. In the South-east part of Shamakha and mountainous area of Gobustan, 11 varieties of crops and legumes, 9 varieties of oil plants, 4 varieties of forage crops, vegetables, watermelon, 65 varieties of fruit trees and 38 varieties of decorative plants (including 3 local) have been produced in past 50 years. The majority of tradition local species have been replaced by modern, foreign varieties, including hybrids. Active process of genetic erosion observed in studied areas, are caused by different factors, including climate occurrences, such as prolonged droughts, high temperatures, as well as soil salinization.



20 % of agricultural lands of **Georgia** is located in semi-arid zones, where crops are usually grown on not-irrigated lands, while orchards and vineyard are planted on irrigation areas. Market-gardening occupies an important place. During last two decades, drastic decrease in agricultural and plantation areas was observed, which have currently turned into second-hand, unproductive pastures. Composition of agricultural species, especially crops and fruits were significantly impoverished in past 50 years. One can barely find 99 varieties of vine, 45 varieties of crops, 29 varieties of apple, 21 varieties of peaches, 18 varieties of plums and 10 varieties of pomegranates. Some of the species are not produced at all, including, millet, rye, lentils, beans. The dissemination of diverse imported species, especially vegetables in the past decade, caused genetic erosion process. It must be noted, that ancient varieties of crops, Shavpkha, Dolis Puri, Zulgo and Tavtukhi are still produced by Sagarejo and Dedoplistskaro municipalities.

Yield of several cultures is reduced by almost 60 %, especially that of spring crops and fruits. Pastures are severely degraded, no preservation activities for increased productivity are being implemented.

In semi-arid ecosystems, 50 varieties of wild relatives can be found, 11 of which is characterized with high vulnerability, including wild rye, Krikina (wild grape), flax, Georgian almond and Sakhokia Berkena. It must be assumed that, changes in climate parameters, observed in semi-arid ecosystems, increase risk for their extinction.

In semi-arid ecosystems, researched within the framework of the project, 11 and 43 endemic species are included in the Red List of Georgia, out of which 20 are local endemic species with narrow distribution.

On the basis of the research, recommendations for monitoring of climate change impact on planting varieties was developed, introduction of which is planned within the scope of the project.

Series of events was also outlined, implementation of which is important for climate change mitigation, such as development of greenhouse farms, introduction of specific technologies for irrigation and soil treatment in dry areas, renovation of windbreak belts, restoration of lowland forest fragments. For facilitating genetic erosion, it is vital to popularize old local varieties, as well as their ex-situ conservation. Awareness raising and information sharing among farmer's is also very important.