Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI)

Final Technical Report

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CACAARI

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Following reports are to be attached to this Final report:

1. Report on CAC Regional Preliminary experts Meeting on preparing Regional strategy of framework Road map implementation for post-GCARD1 Action Plan.
2. Synthesis Report on Transformation of National Agricultural Research and Innovation Systems to increase agriculture productivity of the countries Central Asia and Southern Caucasus.
3. Regional Strategy for Transforming and Strengthening of Agricultural Research and Innovation Systems for Development in the Central Asia and Southern Caucasus region.
4. Brainstorm Meeting Report "Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region"
5. Summary notes on "Asia workshop" organized within EIARD-FSTP project: "Good practices for integration of Agricultural Research for Development into the wider development agenda - workshops for decision makers"
6. Report on the First Training Seminar for Personnel of Agricultural Information Centers of the CAC Region on the Matters Relating to CIARD and Development of Regional Information System.
7. Regional Status Report on Information and Communication Management in Agriculture for Development in Central Asia and South Caucasus
8. Report on International Workshop on Climate Change Adaptation Strategies for Agriculture and Food Security in Central Asia and the Caucasus.

ACRONYMS:

AIS	Agricultural Innovation System
ARD/ AR4D	Agricultural Research for Development
ASTI	Agricultural Science and Technology Indicators
CAC	Central Asia and the Caucasus Association of Agricultural Research Institutions
CACAARI	Central Asia and the Caucasus Association of Agricultural Research Institutions
CGIAR	Consultative Group on International Agricultural Research
EC	European Commission
EFARD	European Forum on Agricultural Research for Development
EIARD	European Initiative for Agricultural Research for Development
FAO	Food and Agricultural Organization
FSTP	Food Security Thematic Programme of the European Commission
GCARD	Global Conference on Agricultural Research for Development
GFAR	Global Forum on Agricultural Research
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICT	Information and Communication Technologies
IFPRI	International Food Policy Research Institute
M&E	Monitoring and Evaluation
NARS	National Agricultural Research Systems
PFU	Program Facilitation Unit
RAIS	Regional Agricultural Information System
RI	Research Institute
R&D	Research and Development
WB	World Bank
WMO	World Meteorological Organization
UN	United Nations

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1. Advocacy: Development and Implementation of the Strategic Platform for Transforming Agricultural Research and Innovation Systems in the CAC region

Introduction

The consequences of climate change have a negative impact on agriculture in the region, which has already been affected by the severe outcomes of the recent global economic crisis. In addition projected population growth, particularly of the urban population, will increase demand for food and prices, which in turn will result in even greater use of limited natural resources. Ultimately, these problems are a particular threat to vulnerable groups, including to people with low incomes. Thus, societies face the challenge of solving these problems, and it is necessary to take action to ensure peaceful, sustainable development and food security in the CAC.

Considering these challenges, national AR4D systems set as primary objectives addressing the issues in order to improve agricultural productivity, increase the quality and quantity of food through intensification and diversification of sustainable agriculture and to develop the knowledge for the efficient use of natural resources, mitigating the negative impact of the consequences of climate change. A priority cross-cutting issue is addressing the needs of vulnerable and low income groups minimizing projected adverse effects of the above mentioned threats.

In this regard, the AR4D system of the CAC focuses joint efforts on four main goals of agricultural research:

1. Improving the well-being of the rural population, particularly vulnerable groups and those dependent on agriculture;
2. Guaranteed improvement of the quality and quantity of nutritious food through the intensification and diversification of agriculture;
3. Rational use of natural resources;
4. Mitigating adverse effects of climate change.

On the other hand, the GCARD-1 lays ground for change in the basic architecture of, and investment in, agricultural research for development. It also provides opportunity for all those concerned about the future of agriculture and its role in development to contribute towards building more coherent and effective research systems through collective effort that can be valued for their development impact.

It also provides the key mechanism for consultation and basis of the new strategy and results framework-setting process of the CGIAR (and its component “CRP – CGIAR research programmes”) and ensuring these reflect the needs and aspirations of partners in developing countries. Development of mutual accountability in such processes is essential to realizing the value of the international system in support of national development needs.

Over the period started before GCARD1 since 2009 and 2010- 2012, between GCARD1 and GCARD2 involves a rolling process of analysis, e-consultations, face-to-face discussions and brainstorming to develop and refine a new global system for agricultural research for development.

Thus, the Strategic Framework developed for transforming and strengthening agricultural research and innovation systems in the CAC provides an integrated approach based on (i) need for an

integrated regional agricultural policies aimed at achieving the above goals; (ii) the opportunities for bigger impact by strengthening cooperation between national AR4D institutions and multi-stakeholder regional centers and institutions in the field of agricultural research, innovation and education to facilitate actions for development along agricultural production and food chains; (iii) the implementation of collective actions to overcome the common problems at the regional level, such as trans-boundary diseases, use of natural (water, land) resources, and (iv) the further improvement of food security policy, providing for the development and integration of regional markets, enhancement in trade and commercial relations and modernization of communication infrastructure, and others.

Transformation of AR4D in the CAC aligns with the six elements of the GCARD1 Roadmap, and suggests strengthening of all its constituent elements: (i) innovative research, (ii) education and capacity building, (iii) extension services; and development of ICT conducive to the transformation.

Implementation of agreed actions is not feasible without adequate participation of all stakeholders, and particularly without due government attention and increased investments in agricultural research and innovation.

In the CAC it is proposed that investments to AR4D gradually increase so that in 2025 they should reach 1% of agricultural GDP.

Objectives of the transformations

The goal of AR4D transformation is assuring a larger impact on improvement of agricultural productivity, increase in the quality and quantity of nutritious food, minimizing adverse impacts on the environment through rational use of natural resources, and mitigation of the negative impact of climate change on agriculture. In addressing these issues the focus should be on the needs of vulnerable and low income groups.

The main objectives are: (i) identifying the main priorities of agricultural research as determined by the needs of society and science at national, regional and global levels; (ii) ensuring equal opportunities for participation and transparency among all stakeholders in the planning and implementation of agricultural research and innovation development aimed at the achievement of the goals set; (iii) increase the funding for development of improved systems for agricultural research, education and extension; (iv) development of the human and institutional capacity required for the generation of relevant agricultural knowledge, and linkage with its users; (v) integration of innovations with the goals of development programmes and policy; (vi) disclosure of the efficiency of measures taken, through monitoring, evaluation and reporting.

The objectives of the AR4D transformation indicate how goals can be achieved, or in other words, what needs to be done so that the agricultural research and innovation system will be able to generate the necessary knowledge linked to challenges in agriculture and meet the needs of agricultural producers, including smallholders.

CAC Regional Preliminary experts Meeting on preparing Regional strategy of framework Road map implementation for post-GCARD1 Action Plan

CACAARI Preliminary experts Meeting[1] aimed to develop Regional Strategy framework for GCARD-1 Road map implementing at considering a Post GCARD Action Plan Proposal by CACAARI for the Central Asia and the Caucasus Region (Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) for increasing agricultural productivity through strengthening agricultural research, education and extension. That also required providing appropriate active participation of the NARS in the region collectively in implementation of CRP.

This Meeting was attended by representative from already appointed and selected Experts for widely describe current situation AR4D in country and the status of investment and financing of AR4D whole picture of all Agricultural sector development and status of AR4Din the eight countries of the Region: Experts discuss key issues for CAC Region emerging from GCARD1, role of CACAARI and CGIAR in Post GCARD1 Actions as well as Regional and Inter-regional collaboration and partnership issues. This should fed into creation of Framework for sustainably improving agricultural productivity in Central Asia and the Caucasus.

Preparation of good national reports was a pre-requisite for developing a draft framework for transforming agricultural research and development (ARD) systems in the CAC region to improve agricultural productivity and production.

Outputs of the experts' meeting include:

- 8 national strategies for transformation and strengthening of National Agricultural Research and innovation Systems;
- Network of national experts who are involved in developing, implementation and monitoring of Regional Strategy.

Outcomes include the following:

- participation and ideas-sharing from various countries of the CAC Region on preparing outlines for Regional strategy framework of implementation GCARD-1Road map;
- discussion of key issues for CAC Region emerging from GCARD1 in the context of the role of CACAARI;
- considering a Framework for sustainably improving agricultural productivity in Central Asia and the Caucasus in context of GCARD1 principles;
- leveraging the CGIAR programs in the region through collective NARS actions, inter-regional collaboration in specific contexts and globally through GFAR.

During the experts meeting national experts gave an overview of the country covering the aspects of population, GDP and share of agriculture in it, information on educational level, livelihoods pattern, the development goal of the country; indicated the place and expected role of agriculture in achieving it and briefly discussed issues for meeting the national goal of sovereignty, economic independence, social equality and environmental protection.

In the part of national agricultural research and innovation system there were brief descriptions of the components of agricultural research system, agricultural education system, and extension and rural support services, as well as status of collaboration among research, education and extension, role of civil society organizations in agriculture development, and of private sector in agricultural research and development. National experts also stressed the priority needs of NARS with respect to

[1] Report on Experts' meeting is attached

infrastructure and facilities, capacity development (in research, education and extension) identifying areas for which capacity development is required.

Other aspects discussed during the meeting were concerned about:

- The national agricultural research and development system covering its multi-stakeholders (public, civil society and private) and their responsibilities, coordination mechanisms, partnerships, etc, with emphasizing the present situation of the Agricultural Innovation System (AIS).
- Investment in agricultural research for development (in different sub-sectors and ARS by country and the donor support and its mechanism of coordination and monitoring
- Policy issues for improving land tenure, access and property rights; strengthening infrastructure and marketing; improving livelihoods opportunities for income generation; and increasing role of women in agriculture and ARD
- Capacity building
- Collaboration and Partnerships (national, regional and international)
- Governance issues (inclusiveness or involvement of all the stakeholders of ARD including famers, gender, NGOs, private sector, etc.)
- Knowledge sharing among ARD stakeholders
- Monitoring and evaluation

It was important for each country to answer the "What and Why" aspects for transforming ARD together with the "How and When" aspects. Some aspects of "What and Why" for each of the eight countries in the region were discussed during the preparations and synthesis of the CAC Regional Report in 2009. Building the national experts team and collective consultations during the expert meeting held on 21-22 June, 2011 is an opportunity for the CAC region to revisit these issues and prepare good national reports covering these aspects, and also covering the "How and When" aspects and with which priority needs to be answered so as to help transform ARD in the CAC region.

Thus, the national reports were developed to identify national needs and possible actions to satisfy them. This contributed to identify the commonalities in the needs and actions of the countries in the region which would need to be addressed at a regional level. Also, needs and actions were identified where support from the global ARD community can be expected. Likewise, the areas where CAC region can contribute to global ARD implied to be identified.

Collective actions:

- required in research and knowledge sharing to address theme-based outputs;
- eight thematic areas for collective action identified:
    1. agricultural systems for the poor and vulnerable;
    2. enabling agricultural incomes for the poor;
    3. optimizing productivity of global food security crops;
    4. agriculture, nutrition and health;
    5. water, soils and ecosystems;
    6. forests and trees;
    7. climate change and agriculture; and
    8. agricultural biodiversity;
- their implications in alignment of national program priorities and resources;
- national commitments required from different sectors.

Transformation of ARIS:

- transformation and strengthening of ARIS is essential;
- very significant increases in investment in NARIS required to fill the underinvestment gap;

- new investments need clear focus and integration into wider development agendas;
- for this, research must demonstrate its value and relevance to the real clients of research (farm households, consumers and the environmental concerns);
- very clear, urgent and critical need for greatly increased capacities of national actors;
- also required reforms in NARIS, technological innovations, stakeholder capacity, creating viable market opportunities, advocating, facilitating and sharing initiatives for collection actions

Brainstorm Meeting[2] to discuss Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region

Agriculture in the CAC faces problems which are the legacy of past decades, and others caused by the unstable situation in the global economy and the environment. In addition, the volatility of prices for food products and greedy consumption of natural resources, are threats to smallholders and vulnerable populations, including people with low incomes. Population growth will lead to increased food consumption and the use of even more natural resources. These issues require a comprehensive approach to solve the problems.

Given these challenges, national AR4D systems needs to define priorities to actively contribute to improvement of agricultural productivity, improvement the quality and quantity of food through intensification and diversification of sustainable agriculture, mitigating the adverse impacts of climate change, while considering the needs of smallholders, vulnerable and low income groups as priority cross-cutting issues. All these require rethinking of the AR4D role in achieving these goals, as well as generation of the knowledge that will facilitate this process.

Considering that conventional agricultural research systems cannot adequately address the existing needs of agricultural and rural populations for reduction of the anthropogenic impact on environment and its consequences, it must be transformed into a system of result-focused agricultural research and innovation.
To define future priorities and create a clear vision of new challenges the AR4D systems need to establish a well-functioning system of strategic forecasting and planning in agricultural development.

Such system must provide for the implementation of:

- socio-economic, technological and environmental development forecasts periodically updated and used to set up or revise the priorities and strategic planning in agriculture;
- national and regional programs and projects aimed at achieving selected priorities in the agricultural sector;
- formulation of objectively verified indicators for the implementation of strategic plans and national and regional programs[3].

To achieve the defined priorities of national AR4D should:

- participate in strategic planning of agricultural development, improving food security;
- involve all stakeholders in addressing the needs of the rural population, agricultural producers, as well as the needs of vulnerable populations;

[2] Brainstorm meeting report is attached.
[3] Measuring indicators of the progress of these plans, should be recommended to all parties concerned, but not compulsory for ministries of agriculture and AR4D system

- effectively combine the traditional knowledge, new approaches and technologies to meet urgent needs in agriculture;
- undertake measures based on available resources and skills, and clearly comprehend what technologies and knowledge can be accessed from external sources.

At the regional level close cooperation is required among all stakeholders, to strengthen interactions among national, regional and international organizations to increase the number and quality of regional programs and initiatives aimed at addressing common problems and cross-cutting issues by enhancing existing and creating new, more effective, multi-stakeholder approaches in cooperation are required.

The Strategic Framework for Transforming ARD systems to improve agricultural productivity was based on the synthesis of the national strategic frameworks and included the analysis of reference material, government decisions, national programs and agenda, and the whole policy on transforming and financing ARD, national priorities, specificities and peculiarities of country approaches and policies in line with the implementation of the priorities and principles of the GCARD Roadmap.

The main objective of the Regional Brainstorm meeting "Transforming and Strengthening National Agricultural Research and Innovation Systems in CAC region", to be held in Tashkent, Uzbekistan on 29 November - 03 December 2011 was to discuss the Strategic Framework for Transforming and Strengthening Agricultural Research and Innovation systems in CAC in line with the principles of the GCARD1 Road Map on AR4D. The Brainstorm meeting brought together policy makers and other public and private parties in agricultural research and innovation system from the eight member countries of CACAARI.

Following can be defined as results of the Brainstorm meeting:

- An implementable Strategic Framework developed for Transforming and Strengthening Agricultural Research and Innovation systems in the CAC Region;
- Heads of the National Agricultural Research Systems from Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan will attend the meeting;
- Valuable remarks and comments received, which were incorporated in the Strategic Framework, which in turn widely distributed among policy and decision makers, national and international agricultural research institutions and organizations, universities, farmers', women's, and non-governmental organizations, private sector in agriculture of Central Asia and the Caucasus Region.
- Understanding of necessity ARD transforming and increased investment related to its process increased among participated Senior policy and decision makers, Research and Innovations Managers, Donors operating in the CAC region;
- In 2012, the Regional strategy for transforming of agricultural research and innovation systems, was adopted by NARSs for implementation.
- Agricultural Science and Technology Indicators (ASTI) has been launched under the mainstreaming of the development and implementation of the Regional Strategy for Transformation of Agricultural Research and Innovation System in CAC Region.

The Brainstorming concludes:

- The agricultural scientific and innovation knowledge is required by farmers and smallholders;
- The application of this knowledge allows reducing the cost of production, increases productivity. Increased production leads to food security;
- Innovations have social and economic effects, provide employment, allow neighboring households to benefit from innovations;

- Innovative projects developed and implemented in and for the existing conditions
- It strengthens the international links between scientists to get new technologies into countries;

By the opinion of brainstorming participants, the most important institutional and policy changes that are needed to mainstream integration of AR4D with agricultural innovation involving smallholders are:

- Enabling policy and legal environment. The relevant laws should exist and be practical functional, and comprehensive. Tax breaks, tariffs, incentives should be introduced.
- Increase the funds and investment in applied research.
- Quality standards need to be set
- Activities aimed at changing mind-sets
- Information and consultation services should be tangible
- Encourage private companies to import technology – develop market for such equipment
- Assist farmers in getting organized to use technology jointly.

Actions to be included in the Regional Strategy for transformation of AR4D in order to ensure that these changes are made were found as:

- Regional Strategy should include: Common interests (regional) and Private interests (national)
- Donors, external actors have to promote regional collaborative work;
- CACAARI has to be a platform for regional scientist to exchange ideas;
- CACAARI should organize a workshop to disseminate the knowledge and experiences;
- CACAARI should promote information exchange on and adoption of innovation from neighbouring states.

Conclusions

Participatory approach to the process of agricultural research and implementation of its results into production and improving access to agricultural knowledge will increase the practical value of scientific developments and will facilitate their integration into innovation system.

These goals cannot be achieved only by a structured transformation of agricultural research systems aimed at generating necessary knowledge and innovation. It also requires development of a favorable environment and the ensuring of all necessary resources, political support and promotion of agricultural research.

The CAC countries require to take a more holistic approach which takes into account not only productivity factors but also issues of food security and nutrition, livelihood and environmental sustainability based on coordinated activities among countries and the need to reach acceptable compromises.

The joint efforts of all stakeholders should be concentrated on this process: public and private sectors, including producers, intermediaries and consumers of agricultural knowledge and innovation, and the international development institutions of AR4D at national, regional and global levels.

Science-based agricultural development strategy should obviously take into account multifunctional modern agriculture, and its influence on implementation of key social, demographic, environmental

and political activities. In this comprehensive approach AR4D should justify budget expenditures for agricultural development, demonstrate the contribution of agricultural sector in the national economy and lay the foundations for its innovative growth.

Transformation of extension systems should be a priority in the short term development of AR4D. Enhanced extension systems will assist farmers in making economic and innovative decisions on improving productivity, introducing new technologies, and enhance resilience to food and economic crises and climate change impacts through improved information management, application of R&Ds.

The transforming and strengthening of AR4D requires participatory coordination and awareness by research institutions and organizations of the ongoing AR4D activities and creating enabling environment for continuous improvement of scientific and professional capacity material and technical resources for development and promotion of demand-driven innovations in agriculture and in associated areas of science and economics.

The Regional ARD system is still under reorientation process, which progress is hindered by its under-financing, since region still goes through economical transition. The regional platform CACAARI facilitating the ARD transformation process is under-resourced as well. To greater impact the CACAARI capacity has to be strengthened.

2. Strengthening AR4D institutions

Consortium of Universities

Consortium of Agricultural Universities for Agricultural Research for Development in Central Asia and the Caucasus, initiated and supported by Tashkent Institute of Irrigation and Melioration, Uzbekistan (TIIM), Central Asia and South Caucasus Association of Agricultural Research Institutions (CACAARI), International Center for Agricultural Research in Dry Areas (ICARDA), Project Facilitation Unit of the Consultative Group of International Agricultural Research (CGIAR) for CAS and GFAR.

Foundation Meeting of the Consortium of Agricultural Universities was held on July 12-13, 2010 at Tashkent Institute of Irrigation and Melioration (Uzbekistan).

The mission of the Consortium of Agricultural Universities is to make an own contribution in agricultural research and innovation through collaboration and partnership for development of agricultural sector in the region.

The overall objective of the Consortium is to foster ARD, education and extension in Central Asia and the Caucasus Region for the benefit of the farmers and other ARD stakeholders to maintain sustainable development.

Specific objectives of the Consortium are to:

- provide a platform for dialogue on critical issues related to ARD, education and extension through collaborative action and partnerships at the national and regional through CACAARI;
- advocate and foster actions for increased efforts for ARD, education and extension in CAC Region in partnership with CACAARI;

- encourage the establishment of appropriate capacities in agricultural development in accordance with identified national, regional or multilateral priorities through and with support from CACAARI;
- assist in strengthening of organizational and management capability of Agrarian Universities for ARD, education and extension; and
- strengthen cross-linkages between national, regional and international agricultural development organizations, including civil society organizations, universities, farmers' organizations, women's organizations, professional societies, private sector organizations in agriculture, etc. through involvement in jointly-planned education and extension programes for agricultural development.

Consortium of Agricultural Universities of Central Asia and South Caucasus became a Founding member with voting right of new GCHERA board (GCHERA General Assembly held on Thursday 30 June 2011 at the Institute Polytechnique Lasalle Beauvais, France, on the occasion of the GCHERA Conference 2011).

Consortium of Agricultural Universities of CAS region has cooperation with Agrinatura.
AGRINATURA is the European Alliance on Agricultural Knowledge for Development and formed by 35 European universities and research organizations working in agricultural research, education, training and capacity strengthening. AGRINATURA is a Standing Committee of ICA.

Inter-regional cooperation with AGRINATURA based on Erasmus Mundus CASIA project between 7 EU Universities and 13 Central Asian Universities.

Farmers

In October, 2009 CACAARI under the guidance and support from GFAR has taken initiative to bring together the farmers' associations/organizations of different CAC countries and created a Consortium of Farmers in the CAC Region to assist to better interaction of farmers' organizations in different countries to interact with one another and with the research systems.

NGOs

The interaction of the non-governmental organizations (NGOs) with the AR4D system in the CAC region is very weak, because of fewer existing NGOs in the CAC countries that deal with agricultural research and development, and difficulties to convince the agricultural policy makers about the role that they could play in AR4D. However, Kazakhstan and Tajikistan have encouraged the agriculture-related NGOs to play some meaningful role in agricultural research and development. In this aspect, Uzbekistan is lagging behind and needs to encourage the role of NGOs in agricultural research and development. Given challenges, in October, 2009, Consortium of agriculture-related NGOs in the CAC region was established in which CACAARI under the guidance and support of GFAR has played an important role.

Private Sector

The private sector in the CAC region has so far played a very limited role in AR4D. No AR4D of any consequence is currently being supported by the private sector in any of the countries in the CAC region which is contrary to the situation in some other regions where the private sector does support AR4D. Thus, creating a private sector consortium is a challenge for CACAARI.

Monitoring Progress towards the Targets of the CACAARI Regional Strategy: The Role of the ASTI Initiative

Investment in agricultural research and development (R&D) is an important means for achieving agricultural productivity growth. The CAC region faces critical limitations on land and water resources for agricultural production while the effects of climate change and food price volatility are felt strongly. The extent to which countries in this region will be able to meet their own food security needs or rely increasingly on food imports will depend on how well they manage their food and agricultural policies, especially their investments in agricultural R&D and related science and technology policies.

Quantitative information is fundamental to understanding the contribution of agricultural R&D to agricultural growth. R&D indicators are essential to measure, monitor, and benchmark the inputs, outputs, and performance of agricultural R&D systems. Stakeholders need to be able to identify trends in agricultural R&D investments and capacity, as well as gaps and neglected areas to set future investment priorities, and to better coordinate and harmonize research. The Agricultural Science and Technology Indicators (ASTI) initiative fulfils a unique role in providing the information needed to promote an understanding of the current status and direction of national agricultural research systems in developing countries.

Basic information on the size and scope of agricultural R&D capacity and investments, the changing institutional structure and functioning of agricultural research agencies, and underlying science and technology policies are largely unavailable for CAC countries. In order to fill this gap, ASTI and the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI) embarked on a data collection exercise in 2012. The survey targeted every government, nonprofit, and higher education agency involved in agricultural R&D in seven CAC countries: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. As of November 2012, data collection activities in Armenia, Azerbaijan, Georgia, Kyrgyzstan, and Tajikistan had been completed, while data collection in Kazakhstan, and Uzbekistan was still ongoing.

ASTI and CACAARI are currently looking to secure funding for further data verification, data analysis, the preparation of a number of country and regional publications, and the organization of a number of outreach activities. This would require the involvement of a (Russian speaking) expert for a period of roughly six months.

Expected Outputs:

- Series of country notes describing recent trends in agricultural R&D spending and capacity in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.
- Analytical report on the status of agricultural R&D investment and capacity in the CAC region.
- Online database including various indicators on investments, human resource capacity, and institutional developments.

- Funding permitting, a number of outreach activities to raise awareness among key stakeholders on the status of agricultural R&D investments and capacity in the countries/region.

Impacts of the ASTI initiative:

- National partners have widely used ASTI evidence to advocate for increased R&D funding, the hiring/training of (women) researchers, raising the retirement age of research staff, etc.
- Participation in the ASTI survey has prompted improved M&E at a large number of institutions.
- Donors and international organizations have widely used ASTI data for priority setting and decision making.
- ASTI data feed into important policy documents (e.g. Ban Ki Moon report on Agricultural Technology for Development, G8/G20/OECD reports, FAO State of Food and Agriculture, World Development Report, etc.)

The results of ASTI show that CAC region is suffering from severe underinvestment in AR4D[4].

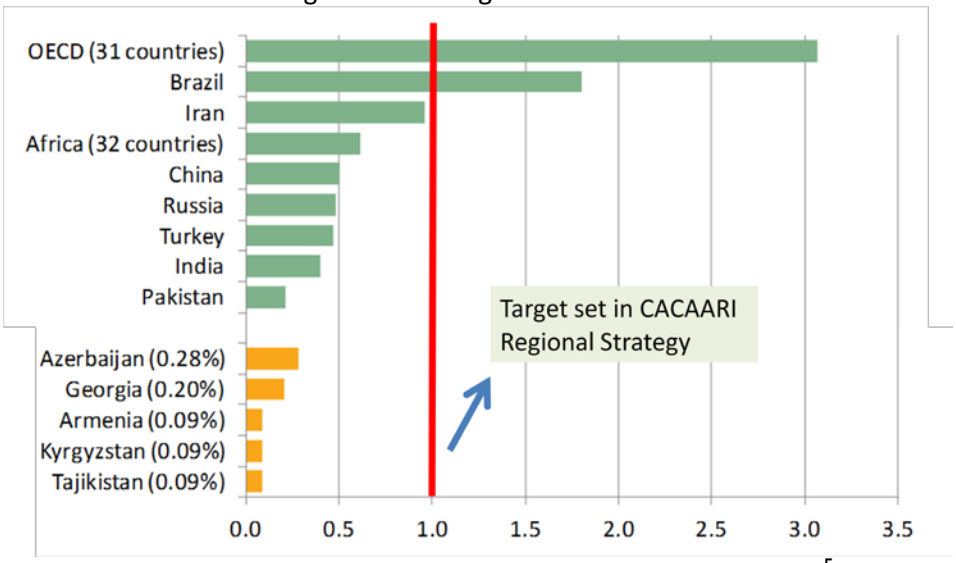

Figure 1. Investments in AR4D as a percentage of Agr.GDP[5]

Conclusions

- Reshaping of AR4D Institutions in CAC region to enable participation and inclusiveness of policy-makers, NGOs, farmers, private sector, as well as youth, women and other stakeholders in the agricultural research and innovation processes based on better foresight of future challenges and needs in farming, food security and poverty reduction cannot be achieved only by establishing a consortia as a component of the Regional forum. Much work and efforts is required to keep and support their result-oriented activity.

- At present CACAARI Secretary is supported by only consultant on technical issues, whilst more effort required to revitalize the CACAARI consortia activities, based on thoroughly developed and discussed action plan.

[4] The presentation of Dr. Gert-Jan Stads, ASTI Program Coordinator, IFPRI, on current outputs of ASTI is attached.

[5] Data presented for CAC region are preliminary, not for citation.

- Strengthening ARD institutions requires GFAR's evidence-based advocacy for increased investment in research, training and delivery system to help strengthen the involvement of development actors and farmers in research processes.

- The results of ASTI show that CAC region is suffering from severe underinvestment in AR4D, particularly this figure for Azerbaijan is 12.0 mln USD; Georgia (3.0 mln USD); Armenia (2.4 mln USD); Tajikistan (2.2 mln USD); Kyrgyzstan (1.7 mln USD)[6].

- In order to prevent the important achievements made so far from going to waste, it is crucial that ASTI and CACAARI secure the required funds to further strengthen and institutionalize the monitoring of institutional, human, and financial resources in agricultural R&D in the CAC region.

- It is obvious, that situation can be changes only through active participation of policy-makers in ARD activities, since ARD actors themselves (including NARS) do not have sufficient political will and power to make decision on country level and implement the actions proposed by global agricultural community. GFAR and CACAARI have to develop and implement the action plan with practical measures "How" to achieve active participation of policy-makers in ARD activities. Additionally, Support of GFAR should be increased in the part of strengthening the CACAARI human capacity, since actions and measures are conducted by implementers.

- CACAARI Secretary should stress more attentions to sensitization and support the result-oriented activity of CAC consortia, by developing, implementation, monitoring and evaluation of comprehensive and thoroughly developed measures.

3. Inter regional partnership in AR4D

International Workshop on "Climate Change Adaptation Strategies for Agriculture and Food Security in Central Asia and the Caucasus"

The challenge of providing sustainable livelihoods for the populations in the fragile ecosystems of semi-arid and arid areas facing the challenging issues of absolute water scarcity, drought, land degradation and desertification has long been in the pipeline of the countries of Central Asia and Caucasus region. In addition to these, the region also has to deal with other issues including a significant increase in population, poverty, a geo-politically fragile environment, weak investment in agricultural research for development and constraints in human resources and institutional capacities.

Along with the concern of the world community and to meet the challenges arising under the climate change in CAC consultations to discuss the impact of climate change on agriculture and food security, as well as strategies for their adaptation are implied to be urgent. In this regard, it was decided to hold an international workshop, which will discuss issues related to the impact of climate change on agriculture and food security in the CAC region related to the problems and their solutions, to

[6] 2005 PPP prices. Data are preliminary, not for citation.

develop further strategies for adaptation of agriculture and food security to climate change for each country; planning joint research and work.

With support of the World Meteorological Organization (WMO), Project-Facilitation Unit / International Center for Agricultural Research in Dry Areas (ICARDA), the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI) have organized the International Conference on Adaptation to Climate Change and Food Security in Central Asia and the Caucasus in Tashkent, Uzbekistan, on 22-24 October, 2012.

The main objectives of the Workshop were:

i) to provide a better understanding and assessment of climate change impacts on agriculture and the associated vulnerability in the CAC Region;
ii) to discuss and develop informed decisions on practical adaptation strategies for the agricultural sector;
iii) to discuss and suggest appropriate ways to promote adaptation planning and implementation and it's integration into the sustainable development planning in different countries;
iv) to develop a Regional Climate Change Adaptation Framework for continuous information exchange on climate change impacts and adaptation amongst the different countries.

The workshop discussed the ways of integrating research and practice for adaptation measures for agriculture and food security to climate change. Also, questions were raised on strengthening cooperation between academic, research institutions, international organizations, NGOs at the local, national and regional levels in the adaptation of crop, livestock and fish production systems in the CAC region.

Participants worked out recommendations for covering the issues as:

- What are the different climate change adaptation strategies for your user sector in different sectors of CAC?
- What are the appropriate ways to promote adaptation planning and implementation?
- How can the identified strategies be integrated into sustainable development planning in CAC?
- Recommendations for Declaration.

The workshop was attended by over 50 people, including agricultural specialists, representatives of the National Meteorological and Hydrological Services of Central Asia and the Caucasus, international organizations, agricultural research and educational institutions, NGOs, farmers' organizations, etc.

Collaboration with ICRA to integrate “Good practices of Agricultural Research for Development into the wider development agenda”

Agricultural Research for Development (ARD) has a high potential to accelerate pro-poor economic growth. But this potential is not always realized. To unleash this potential, ARD needs to be integrated with innovation in smallholder agriculture and small-scale agribusiness. Moreover, this integration needs to be supported by enabling policies and institutional arrangements.

In this context, CACAARI had organized the Regional Brainstorm meeting[7] "Transforming and Strengthening National Agricultural Research and Innovation Systems in CAC region", to be held in Tashkent, Uzbekistan on 29 November - 03 December 2011 was to discuss the Strategic Framework for Transforming and Strengthening Agricultural Research and Innovation systems in CAC in line with the principles of the GCARD1 Road Map on AR4D. The Brainstorm meeting brought together policy makers and other public and private parties in agricultural research and innovation system from the eight member countries of CACAARI.

On the other hand, within a short-term project[8] lead by the International Centre for development oriented Research in Agriculture (ICRA[9]) on behalf of the European Initiative for Agricultural Research for Development (EIARD[10]) was implied to be implemented in Central Asia and the Caucasus [11] outputs of which had to be discussed at sub-regional exchange workshop of 2.5 days between well-targeted high-level decision makers in ARD. This workshop had to be organized around a concrete case of successful integration of ARD with rural innovation that benefited smallholder farmers and/or small or medium agro-enterprises. Because of budgetary constraints, the project can only cover a small number of countries in each sub-region.

By combining the GFAR and ICRA resources, it was possible to invite a larger number of people for a longer time than foreseen/budgeted by either GFAR or ICRA (about four participants from each member country, including representatives from Ministries, research organizations, universities and farmer organizations). It also allowed to expose high-level decision makers to the potential impact on smallholder livelihoods that is to be gained from better integration of AR4D with smallholder innovation, and, thus, by creating policies and institutional arrangements that favor such integration.

This collaboration with ICRA has made it possible to integrate the following elements into the brainstorming meeting:

- A field visit to a case of successful integration of ARD with innovation that benefited smallholder farmers and small, medium and large agro-enterprises in the poultry sector in Samarkand region, Uzbekistan. Participants visited key players involved in this case and discuss the main factors contributing to its success, including the supporting policies and institutional arrangements.
- Presentation by the participating decision makers of innovation system posters (one poster per CACAARI member country) showing how ARD is being integrated with innovation in a selected agricultural innovation system in each country and how policies and institutional arrangements are designed to achieve this integration.
- Discussions and analysis of the field visit and the posters to identify major lessons and implications for the regional and national strategies to transform and strengthen ARD and its integration with smallholder innovation.

The Brainstorming meeting was held from 29 November to 3 December. The first two days were organized in Tashkent and focused on the Regional Strategy. The last 3 days focused on a field visit to the poultry case in Samarkand, the four innovation system posters, and group work on creating

[7] The Brainstorm meeting has been narrated in first part "Advocacy" of this report.
[8] The formal title of the project is: "Good practices for integrating Agricultural Research for Development (ARD) into the wider development agenda – workshops for decision makers".
[9] See www.icra-edu.org.
[10] EIARD is an informal coordination group, through which the EU Member States, the European Commission, Norway and Switzerland coordinate European policy and support for Agricultural Research for Development (see www.eiard.org).
[11] as one of the three sub-regions, one each in Africa, Asia and Latin America. The regions provisionally targeted are Francophone West Africa, Central Asia/Caucasus and Central America.

favorable policy and institutional conditions for the integration of AR4D with smallholder innovation in the CAC-region and necessary actions to be included in the Regional Strategy. All sessions had simultaneous translation Russian-English.

Outputs & Outcomes

- More than 50 participants from different national, regional and international organizations have attended the brainstorm meeting, and 24 of them also participated in the field visit to Samarkand;
- The synthesis of the three group reports resulting from the group works;
- Case study on innovation in the poultry sector in Samarkand;
- Four agricultural innovation systems posters (Armenia, Georgia, Kazakhstan, Turkmenistan) in English.

In February, 2012 CACAARI has initiated the training workshop for improving the capacity and awareness of decision makers and farmers in enhancing AIS in the region, but this initiative failed due to lack of funds.

4. Bridging Knowledge Gaps

Transforming and Strengthening Regional Agricultural Information System (CAC-RAIS)[12]

Agriculture in developing countries is expected to resolve unprecedented challenges. Forecast for food needs is that if agricultural sector is not going to double production in the coming decades, the world may be in dire straits. Rising food prices, increasing pressure on natural resources threaten life conditions of the poor. Climate change increases risks over the next decade.

The CAC region, due to a number of historical, geographical and political factors, in terms of its capacity, is an important place for the world agriculture. Threats are in place here fully, and the need for their mitigation is beyond the scope of national and regional objectives.

At the same time, achievements of modern science and technology, as well as institutional changes present unprecedented opportunities for overcoming the challenges ahead. Along with advanced biological science, the most important of those opportunities are new information and communication technologies.

Based on that, major players that together with national governments in developing countries have responsibility to solve problems of agriculture are making efforts to strengthen ICT sector in the agriculture of developing countries. In recent years FAO, CGIAR, GFAR based on regional groups of research organizations such as CACAARI are focused on intensive advocacy and promotion of ICT/ICM in AR4D, as well as on ICT/ICM training for agricultural scientists and other participants of the agricultural sector.

In 2011 CACAARI has developed and adopted the Regional Strategy for Transforming and Strengthening of Agricultural Research and Innovation Systems for Development in the Central Asia

[12] The Status report on ICM in CAC Region and the Report on the First Training Seminar for Personnel of Agricultural Information Canters of the CAC Region are attached.

and Southern Caucasus region, in which increasing the impact of ICT on transforming AR4D and agriculture development is considered as one of the priorities.

To increase the effectiveness of advocacy and promotion measures and strategic planning, GFAR conducts monitoring of ICT/ICM development in AR4D on a regular basis. Accordingly, Survey on ICT/ICM development in AR4D in the CAC region has been conducted in 2011, comparisons with the data of report for 2007, regional information systems' response to new challenges and proposals for its further development, as well as discuss the issues on ICM stipulated in the Regional Strategy (CACAARI)

First Training Seminar for Personnel of Agricultural Information Centers of the CAC Region

The Training Seminar Application of ICT/ICM in the Propagation of the Outcomes of Agricultural Research for Development (Application of CIARD Mechanisms) was arranged and held by the Georgian Federation of Information and Documentation in accordance with the CACAARI Activity Plan for 2011, coordinated with GFAR and backed thereby with the support of Georgian Technical University. Lectures and practical training were conducted in the GTU-based computer centre equipped with up-to-date computer and audio facilities. Representatives of the CAC Region countries took part in the work of the Training Seminar

The national reports – Information and Communication Management in Agriculture for Development - were heard and discussed at the Training Seminar. The reporters by each country of the CAC Region were coordinators from Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.

The Training Seminar was aimed to inform the participants about CIARD and its constituent parts: CIARD RING and CIARD Fairs, about the benefits of a coordinated, standardized approach during generation and dissemination of agricultural information for research and development; information about international information systems - AGRIS and AGRIS CARIS; on information service of European Union CORDIS; on the use of multilanguage vocabulary AGROVOC for information search in relevant DBs; on the preparation of information for input into international DBs; on standards in agricultural information; on the prospects of development and tasks of international and national agricultural information systems of a new generation (Web 2.0, Web 3.0); on their application for dissemination of agricultural information; on the current state and prospects of AgroWEB development, etc.

As results of training:

- 24 participants from six agricultural university-based libraries and two national information centers specializing in agricultural information have attended the training.
- The participants had the opportunity to practically see the possibilities of CIARD RING of search in and access to global information resources and introduced to the standards in agricultural information and their links with international metadata standards, the methods of use of the AGROCOLA, AGRIS, AGORA databases for searching agricultural information.
- The prospects of development and tasks of national agricultural information systems of a new generation were discussed.

The Training in Tbilisi has familiarized the representatives of National nodal points with:

- the whole spectrum of the current and long-term tasks of agricultural information management for development and their implementation within the scope of RAIS
- The possibility of taking part in CIARD RING as a means of realization of the tasks of agricultural information for development
- Principal agricultural information resources (paid and gratis) and instruments, including the regional ones and the practical work with the most important of them
- The practical work experience of each of the participating organizations with different consumer groups

The Training in Tbilisi has achieved:

- Single understanding by all of the participants of the tasks of agricultural information management for development in the CAC Region;
- Understanding of the tasks as well as main technological and managerial CIARD principles;
- The awareness of international information resources registered with CIARD RING, as well as some unregistered resources and the possibilities of their use for needs of farmers, agricultural consultants, scientists and the State machinery;
- Agreement on coordinated actions targeted at the CAC RAIS development with due regard for the CIARD challenges and initiative.

By efforts of CACAARI with the support of GFAR and FAO managerial prerequisites for further development of RAIS have been made and activities for enhancing the potential of National information nodal points have been planned. The nodal points have been identified. The CIARD Initiative has been determined as the main and reference point for further development of NAIS and RAIS.

Actions to achieve ICM in AR4D goals in the CAC region

Further development of NAISs and RAIS in CAC (perhaps in relation to the latter it is better to speak about its formation) should be carried out taking into account above mentioned challenges and changes that are clearly understood in the professional community. Success will depend on involvement in this process of all the key players (stakeholders): Government, agricultural and other related information services, all groups of consumers, donors, etc.

In the CAC region, it is impossible to maintain the development process without substantial capacity building of involved organizations and services. There is also a need to make significant efforts to promote the objectives of NAIS and RAIS. In this respect, very favorable factor is that major donors (FAO, GFAR, the European Union) not only support the systems' response to changes, but they are the initiators of major positive changes and of specific development goals. Another positive factor is the appearance of the CIARD initiative which took into account all the key challenges discussed above and provided professional services and organizations with long-term objectives.

The essence of the CIARD initiative is promotion of development of information products and services based on modern technologies of information processing that enable effective information exchange within CAC countries, as well as at the regional and global levels. This coincides fully with interests of information services, national and regional systems of the CAC region. The CIARD offers the guidance and best samples of products and services that can be followed. Attractiveness of the CIARD Initiative ideas helps to develop NAISs and RAIS. In particular:

- Calls for such improvement of policies, strategies and structures of information exchange,

which takes into account new technological opportunities and challenges faced by agricultural research;
- Provides guidance on the need to create a depositories and follow the practice of Linked Open Data and Linked Open Information Objects;
- Facilitates appropriate and effective description of resources (based on standards, rules and regulations) that increase the visibility of local resources at the national, regional and international levels;
- Promotes better organization in the region own sets of data and information as well as their interaction with other data and information in order to better represent data and provide information to own users;
- Helps intense transition to the use of Web 2.0 technologies and, therefore, prepare for the gradual utilization of Web 3.0 technologies.

In the time period between publications of the two Reports (2007-2011), as it was in the period before 2007 as well, CACAARI with support of the GFAR and FAO was the main advocacy agency promoting development of ICM in AR4D in the CAC region. The use of ICT/ICM in AR4D has become one of the main CACAARI activities:

- Two Regional Reports on the status of ICT/ICM in AR4D in the CAC region have been published. Within framework of the Regional Reports' elaboration, the National Reports of all countries in the CAC region have been elaborated twice as well;
- The participation of ICT/ICM specialists of the agricultural research system of the CAC region in international (regional and global) forums where they primarily discussed ICT/ICM in AR4D has been ensured (Moscow, Hyderabad – 2009, Montpellier - 2010, Beijing - 2011, Bangkok - 2011).
- A number of regional workshops and seminars discussing ICT/ICM in AR4D have been conducted in Tashkent and Ashgabat (2007-2010) for:
  - CACAARI management;
  - University Rectors;
  - Farmer Organizations,
  - NGOs;
  - Heads of information services in the field of agriculture.

- In 2010, all stakeholders came to an agreement on the further development of RAIS;
- Nodal information points of the RAIS in each country of the CAC region have been identified;
- Mechanism of inter-regional cooperation has been utilized in which APAARI (Asia-Pacific Association of Agricultural Research Institutions) provided effective support to the CACAARI in preparation of a regional report and training for professionals in the field of ICT/ICM.

Since 2007 CACAARI overcame and still overcomes significant organizational difficulties associated with reorganization of agricultural research systems in the CAC region. As a result, CACAARI had to create RAIS from elementary level. In 2011 several events have been planned to improve use of ICT/ICM, in particular:

- Workshop/training to support and promote the CIARD and action plan related with the CIARD has been held in Tbilisi, December 12-16, 2011, as a measure to strengthen the capacity of RAIS' National Nodal Information Points;
- The Status Report that has been developed based on advanced methodology, for the first time, specialists from the National Nodal Information Points have been involved for preparation of the National Reports as well.

Currently CACAARI is focused on promotion of the CIARD initiatives in the region.

Actions implemented by CACAARI Secretariat:

- Development of RAIS advocating allocation of additional funds by donors (including those working at country level), as well as by Governments in the CAC region;
- Continuous advocacy activities to make the NARS' managements involved in development of NAIS and RAIS which are an integral part of NARS' in the CAC region;
- Involving management of research institutes, universities, associations of farmers and entrepreneurs and NGOs in support activities for development of NAIS and RAIS;
- Strengthening the CACAARI website and electronic infrastructure (organization of e-discussions, of document depositary, of databases: on institutions, experts, projects, farmer and non-government organizations, universities, consulting services, etc.);
- Enhancing collaboration of the National Nodal Information Points for development of RAIS, while all NAISs interact with each other and with global agro information system, as well as with CACAARI headquarters.
- The Secretariat conducts monitoring of these activities, as well as creates in partnership with Nodal Information Points a set of databases mentioned in the previous item.

Outcomes of the actions

In accordance with key international documents (*GCARD RoadMap. CACAARI Regional Strategy*) that define prospects of AR4D, the status of ICT/ICM use in AR4D, as well as in dissemination of research results have been studied in the CAC region.

There is a lack of funds for research in the CAC region, part of which is the ICT/ICM development. This fact predetermines the low level of information activities in the field of agricultural research, both in ensuring information for research and dissemination of the research results.

In 2011-2012 some progress in ICT/ICN technological and organizational infrastructure has been achieved with support of international organizations (FAO, GFAR, EU). Significant funds have been spent on integration of agricultural information communities of the CAC countries into the world community. New information products have been created using modern information technologies. The organizational pre-conditions for further development of RAIS have been created. The National Nodal Information Points (NNIP) has been identified, as well as the NNIP's capacity building measures have been undertaken. The CIARD Initiative is identified as landmark and mainstream for further development of NAIS and RAIS.

Conclusions:

- Further development of National Agricultural Information Systems (NAIS) and the Regional Agricultural Information System – RAIS CAC should be carried out with due regard for the foregoing challenges and changes clearly understood in the professional environment. The success will depend on the involvement of all the stakeholders in the process: governments, agricultural and allied information services, consumers of all categories, donors, etc.
- In the CAC Region, it is impossible to do without an essential upgrading of organizations and services involved in the process. Significant efforts need to be made in the propagation of the NAIS and RAIS purposes.

- An exceptionally favorable factor is that the main donors (FAO, GFAR, EU) not only support the response of the systems to changes, but themselves are the initiators of serious positive changes and determination of the development purposes.
- A positive factor is the emergence of the CIARD Initiative that has taken into account all the serious challenges discussed above and provided professional organizations with long-term reference points.
- The essence of the CIARD Initiative to stimulate the development of information products and services based on the up-to-date information processing technologies enabling to organize an efficient exchange in the countries, the Region and globally fully complies with the interests of agro information services, national agro information systems and the CAC Regional system.
- The information exchange policy, strategy and structures need to be improved with due regard for novel technological possibilities and challenges being faced by agricultural research.
- In the Region as a whole, the lack of funds for scientific research, a part of which are the works on the ICT/ICM development, is felt.
- CACAARI, with the support of GFAR and FAO, is the principal propagator of the necessity of development of ICM in agricultural research for development in the CAC Region.