Brainstorm Meeting Report
“Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region”

November 29-30, 2011 - Tashkent, Uzbekistan
December 01-03, 2011 - Samarkand, Uzbekistan
This version is draft Report on Brainstorm Meeting “Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region” held on November 29-30, 2011 in Tashkent and December 01-03, 2011 in Samarkand, Uzbekistan.

This report is prepared by CACAARI Executive Secretariat with consultations of CACARRI Technical consultant Dr. Botir Dosov and ICRA international consultant Dr. Jon Daane.

Any suggestions to improve, amend, correct, and complement are highly appreciated.

Executive Secretary,
The Central Asia and South Caucasus
Association of Agricultural Research Institutions

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Cover page photos:

Upper one: Group photo of participants of Brainstorm Meeting taken on November 29, 2011 in Tashkent, Uzbekistan, Conference hall of Hotel Dedeman

Lower one: Group photo of participants of Brainstorm Meeting taken on December 02, 2011 in Samarkand, Uzbekistan, Conference Hall of Hotel Regal Palace
# Abbreviations and Acronyms:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AIS</td>
<td>Agricultural Innovation System</td>
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<tr>
<td>ARD</td>
<td>Agricultural Research for Development</td>
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<tr>
<td>AR4D</td>
<td>Agricultural Research for Development</td>
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<tr>
<td>ASTI</td>
<td>Agricultural Science and Technology Indicators</td>
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<td>AVRDC</td>
<td>World Vegetable Center</td>
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<tr>
<td>BM</td>
<td>Brainstorming Meeting</td>
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<tr>
<td>CACAARI</td>
<td>Central Asia and south Caucasus Association of Agricultural Research Institutions</td>
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<tr>
<td>CGIAR</td>
<td>Consultative Group on International Agricultural Research</td>
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<td>CIMMYT</td>
<td>International Maize and Wheat Improvement Center</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<tr>
<td>EFARD</td>
<td>European Forum on Agricultural Research for Development</td>
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<tr>
<td>EIARD</td>
<td>European Initiative for Agricultural Research for Development</td>
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<tr>
<td>FAO</td>
<td>Food and Agricultural Organization</td>
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<tr>
<td>FSTP</td>
<td>Food Security Thematic Programme of the European Commission</td>
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<td>FTPP</td>
<td>FAO/Turkey Partnership Programme</td>
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<tr>
<td>GCARD</td>
<td>Global Conference on Agricultural Research for Development</td>
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<td>GFAR</td>
<td>Global Forum on Agricultural Research</td>
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<td>GFRAS</td>
<td>Global Forum on Rural Advisory Services</td>
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<td>GOU</td>
<td>Government of Uzbekistan</td>
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<td>ICARDA</td>
<td>International Centre for Agricultural Research in the Dry Areas</td>
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<td>ICRA</td>
<td>International Centre for development oriented Research in Agriculture</td>
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<td>ICT</td>
<td>Information and Communication Technologies</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<td>JV</td>
<td>Joint Venture</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<td>MA</td>
<td>Ministry of Agriculture</td>
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<td>NARS</td>
<td>National Agricultural Research Systems</td>
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<td>PFU</td>
<td>Program Facilitation Unit</td>
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<tr>
<td>RAIS</td>
<td>Regional Agricultural Information System</td>
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<tr>
<td>RUz</td>
<td>Republic of Uzbekistan</td>
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<tr>
<td>SAI</td>
<td>Samarkand Agricultural Institute</td>
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<tr>
<td>TICA</td>
<td>Turkish International Cooperation Agency</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WB</td>
<td>World Bank</td>
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<td>YPARD</td>
<td>Young Professionals Platform for Agricultural Research for Development</td>
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</table>
1. Background

The Central Asia and south Caucasus Association of Agricultural Research Institutions (CACAARI)\(^1\) is engaged in promoting the transformation and strengthening of the agricultural research and innovation systems in the Central Asia and south Caucasus (CAC) region. A major activity in this regard is the development of a “Regional Strategy for Transformation and Strengthening of Agricultural Research and Innovation Systems for Development in the CAC-Region”. This Regional Strategy development is part of the “GCARD Road Map: Transforming Agricultural Research for Development (AR4D) Systems for Global Impact”, launched by the first Global Conference on Agricultural Research for Development (GCARD1) in Montpellier in March/April 2010.

In this strategy development process CACAARI is supported by the Global Forum for Agricultural Research (GFAR). GFAR has financially supported the activities of eight National Experts, one in each CACAARI member country. Most of these are leading personalities in the national agricultural research system. In the course of 2011, these National Experts coordinated the joint formulation of national strategies for the transformation of AR4D by key stakeholders in each country (research, education, farmer organisations, other private sector interests and policy makers). CACAARI then synthesised these national strategies in a Draft Regional Strategy that was circulated among key stakeholders in all member countries. The “Brainstorm Meeting” (BM) that is the subject of this report aimed to discuss and validate this Draft Regional Strategy.

In strengthening the agricultural research and innovation systems in the CAC region, CACAARI also collaborates with the International Centre for development oriented Research in Agriculture (ICRA)\(^2\). This collaboration is financially supported by a project that aims to increase the support of national and regional policy makers for Agricultural Research for Development (ARD) by highlighting ARD’s potential to accelerate economic growth, if it is properly integrated with innovation in smallholder agriculture and small-scale agribusiness and properly supported by policies and institutional arrangements. ICRA implements this project on behalf of the European Initiative for Agricultural Research for Development (EIARD). The project is funded by the European Commission’s Food Security Thematic Programme (FSTP).

Thus, in 2011, CACAARI and ICRA intended to benefit from potential synergies between the Regional Strategy development and the EIARD-FSTP project by jointly preparing and implementing an extension of the “Brainstorm Meeting” for regional policy makers on reform of ARD. This collaboration of CACAARI with ICRA has made it possible to integrate the following elements into the Brainstorm Meeting:

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\(^1\) The Central Asia and south Caucasus Association of Agricultural Research Institutions (CACAARI) is as a neutral forum, where various stakeholders of agricultural research for development in Central Asia and the Caucasus can discuss and debate on issues critical to the agriculture of the future. CACAARI actively promotes communication, knowledge sharing and capacity building involving the various stakeholders in the region, as well as collaboration with global stakeholders.

\(^2\) The International Centre for development oriented Research in Agriculture (ICRA) strengthens the capacity of people and organisations in the rural sector to effectively collaborate, share knowledge and learn from each other in order to accelerate rural and agricultural innovation in support of the Millennium Development Goals.
• 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 (four CACAARI member countries prepared one poster each) 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.

By combining CACAARI, ICRA and GFAR resources, it was possible to invite a larger number of people to the Brainstorm Meeting, for a longer time than foreseen/budgeted by either GFAR or ICRA (about four participants from each member country, including representatives from Ministries, research organisations, universities and farmer organisations). 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 favour such integration.

2. The Brainstorming Meeting
The Brainstorming meeting (BM) was held from 29 November to 3 December (see programme in Annex 1 and detailed minutes of the BM in Annex 2). The first two days were organised in Tashkent and focussed on the Regional Strategy. The last three days focussed on the field visit to the poultry case in Samarkand, the four innovation system posters, and group work on creating favourable 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. Apart from the representatives of GFAR, ICRA, FAO, EFARD, IFPRI and YPARD, all other participants (including regional representatives of ICARDA and CIMMYT and a representative of Wageningen University) used Russian. PowerPoints were projected simultaneously in Russian and English on two screens.

Nearly 40 people participated in the first two days in Tashkent and 24 of them also participated in the field visit to Samarkand (see Annex 3). Almost all members of the national delegations of the eight CACAARI member countries participated in the field visit. The 24 comprised representatives of the Ministries of Agriculture (4), farmer organisations (4), Directors of research organisations and Vice-Presidents of Academies of Agricultural Sciences (6), Heads of research units (2), Directors of advisory services (1) and Vice-Rectors of universities (1), as well

3 A first analysis of this case was conducted by the sub-regional project “Capacity Development for Analysis and Strengthening of Agricultural Innovation Systems (AIS) in Central Asia and Turkey”, implemented under the FAO/Turkey Partnership Programme (FTPP). The case was extended and substantially revised to serve the purposes of the Brainstorm Meeting.
4 After discussions between partners: CACAARI, ICRA and FTPP, the four countries were chosen to prepare Innovation posters. Those are: Armenia, Georgia, Kazakhstan, Turkmenistan.
as CACAARI Executive Secretary and Consultant (2) and four foreigners (1 ICRA, 2 FAO, 1 IFPRI). The country composition of the 24 was as follows: Armenia (4), Azerbaijan (3), Georgia (3), Kazakhstan (1), Kyrgyzstan (3), Tajikistan (2), Turkmenistan (1), Uzbekistan (3), non-CAC-Region (4).

The first day started with general introductions, which the ICRA consultant, Jon Daane, used to present ICRA’s role in the BM and the regional strategy development, the contributions of the European Commission and EIARD, and how they complemented the contributions from GFAR as well as the work of FAO. The day focused on the presentation of the GCARD Road Map, ICARDA’s programmes in the region, the draft Regional Strategy, and presentations by each country of the results of national-level multi-actor discussions on the draft Regional Strategy.

The objectives of the Regional Strategy closely follow the six functions that a well-functioning AR4D system should perform according to the GCARD Road Map and which are summarised as follows:

1. Define needs-based priorities and actions;
2. Ensure equitable partnerships and accountability;
3. Achieve increased investments in AR4D resources;
4. Develop human and institutional capacity for generation and use of knowledge;
5. Coordinate linkages relating innovation to development programmes and policies;
6. Demonstrate the value of AR4D by letting its clients speak for it.

The main results expected from the transformation of AR4D through the Regional Strategy are improved, more impact-oriented national agricultural innovation systems in the CAC-region with a better integration of research, education and extension. The draft strategy document ends with a general set of measures and phasing of their implementation.

The first day ended with a plenary discussion of the Regional Strategy. This was endorsed in general, but the document was found too long, too wordy (so that the message was lost) and needing a logframe. Jon Daane, followed by several other speakers, also emphasised the need to more clearly bring out what the Regional Strategy adds to the eight national strategies of each of the countries. In other words, why does the region need a Regional Strategy?

The morning of the second day was used for some general presentations on the need for an M&E strategy (IFPRI), the Regional Agricultural Information System (RAIS) under development, and the opportunities for collaboration with Europe (EFARD). This was followed by a presentation on the role of AR4D in agricultural innovation systems (ICRA) and on capacity development for analysis and strengthening of agricultural innovation systems (FAO), as well as a presentation on the poultry case that was the focus of the field visit (Uzbek Ministry of Agriculture). Jon Daane used his presentation to also give some information on ICRA and its capacity strengthening partnerships. Several participants requested copies of the presentation in Russian (which were sent).

For the last part of Day 2, CACAARI had scheduled a plenary discussion on the implications of the integration of AR4D in agricultural innovation systems for the Regional Strategy. At the request of Jon Daane, supported by GFAR and EFARD representatives, this was reverted to group work as per the originally agreed programme. Participants were asked to prioritise the main activities for the first (short-term) phase of the Regional Strategy, with a focus on cross-
On Day 3, participants in the field visit travelled to Samarkand (leaving Tashkent at 6:15 and arriving at lunch time). In the afternoon the group was accompanied by the Mayor of Samarkand District and a Samarkand regional official of the Ministry of Agriculture. The group visited a small private input supplier and a large private poultry farm (the “Agalyk-Lohmann-Parranda” farm, a joint venture with Lohmann in Germany). The latter is the only one in Uzbekistan that receives parents from Lohmann, which they cross locally. The young chicks are partly used for their own farm and partly sold to other large-scale farms and family farms. At the Agalyk-Lohmann-Parranda farm, participants also met with the Director of another large poultry farm (Joint Venture “Marokand Parranda”) and two managers of local communities who showed pictures of family farms engaged in poultry production and highlighted the community services supported by the Joint Venture farms. A summary of the discussion is presented in Annex 2.

The morning of Day 4 was used for presentations of the Director of the Scientific Innovation Centre of the National Ministry of Agriculture in Tashkent and representatives of the Samarkand Agricultural Institute and the university on their various activities in the poultry sector. This was followed by a presentation of the innovation system posters from Georgia, Armenia and Kazakhstan. The poster from Turkmenistan was displayed, but the author had been unable to attend the BM. Especially the poster from Georgia (on a private firm that plays a key role in breeding, multiplying and distributing seeds of wheat and maize) raised a lively and sometimes heated debate between those who were opposed to a private sector role in basic seed supply and those who favoured such a role.

The final part of Day 4 was used for group work (in three randomly composed groups) on creating conducive policy and institutional conditions for integrating ARD with smallholder innovation. The plenary presentations showed that the results of the group work were heterogeneous, but complementary. A synthesis of these three group results is provided in the next section. CACAARI secretariat would circulate this among participants for comments. It was agreed that individual country delegations would use this final synthesis to initiate steps at national level to obtain buy-in from higher government levels (Minister/Cabinet of Ministers) for the proposed actions.

CACAARI did not evaluate the BM and the ICRA consultant found it inappropriate for ICRA to initiate this on its own. Informal feedback from many participants indicated that they highly appreciated the field visit because it was found more action-oriented and practical, as well as more interactive than the formal sessions in Tashkent.

3. Synthesis of group work on creating conducive policy and institutional conditions for integrating ARD with smallholder innovation (Day 4 of BM)

On the fourth and the last working day of the BM participants were split into three working groups. Dr Jon Daane recommended to groups to identify and describe, from their own experience, good examples of integration of AR4D with agricultural innovation involving
smallholders and other users, and to list the reasons why they found these examples good. They were also asked to discuss and prioritize the most important institutional and policy changes that are needed to mainstream integration of AR4D with agricultural innovation involving smallholders in their countries. Thus, they could identify actions to be included in the Regional Strategy for transformation of AR4D in order to ensure that these changes are made.

In total, within the time available, groups identified and discussed thirteen good examples of integration of AR4D into smallholders innovation, which are:

1. Production of broiler chicken (5-10,000 per farmer) (Uzbekistan)
2. Centers for growing chicks (1 day - 1 month old chicks). (Uzbekistan)
3. The introduction of non-traditional crops, taking into account climate change (Armenia)
4. Agricultural Enterprise Lomtagora (Georgia)
5. Transplantation of embryos (Kazakhstan)
6. Increased milk production of goats at the foothills and mountainous areas, through the use of innovative approaches (Armenia)
7. Increasing the productivity of bees: a medicine (tablets) for the bees, the cultivation of plants (Armenia)
8. Potato seed production (Tajikistan)
9. Yak breeding (high altitude regions Tajikistan)
10. Cooling aggregates of fruits and vegetable stores
11. New dry fruit technology
12. Sowing maize in between harvested grain rows
13. Increase of food production to improve the livelihood of smallholder farmers (poultry and fisheries).

The reasons why those examples were found illustrative are:

- There is a demand of users for agricultural scientific knowledge
- 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
- In some examples Governments provide a supportive enabling environment by developing legal framework, allowing tax grace period, easing access to soft loans, supporting extension services, which provide information support and dissemination
- Capacity building support
- Private sector is involved and supported by strengthening the capacity, facilitating access to genetic resources, providing investment in smallholders’ innovative technologies and infrastructure, providing soft loans.

In the opinion of the working groups, 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. Provide a system to recognize services from research institutions to smallholder farmers. (Fundamental research is funded by state, applied research is not fully funded)
• Quality standards need to be set
• Activities aimed at changing mind-sets
• Consumers’ request to the Government, Donors
• 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
• Leasing or affordable interest rate program.

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.

4. Follow-up by CACAARI and possible collaboration with ICRA

Considering the overall understanding what kind of follow-up activities should be undertaken with collaboration with ICRA, CACAARI is proposing the Program on Strengthening the capacity of stakeholders of National Agricultural Innovation Systems (see Annex 9).
### Annex 1.

**Programme for Brainstorm Meeting**  
for Transforming and Strengthening of Agricultural Research and Innovation Systems  
in CAC region

**November 29-30, 2011 - Tashkent, Uzbekistan, Hotel Dedeman**  
**December 01-03, 2011 - Samarkand, Uzbekistan, Hotel Regal Palace**

<table>
<thead>
<tr>
<th>Day 1 - Tuesday, 29/11/2011, Tashkent</th>
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<tbody>
<tr>
<td>09:00-09:30 Registration</td>
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<tr>
<td><strong>Session 1. Chairman: Academicián Djamin Akimaliev, CACAARI</strong></td>
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</table>
| 09:30-10:00 Opening Session / Welcome Statements  
of Ministry of Agriculture of Republic of Uzbekistan by Mr Rustam Ibragimov  
of GFAR by Dr. Mark Holderness, Executive Secretary GFAR  
of CGIAR / ICARDA by Dr. Josef Turok  
of CACAARI by Acad. Djamin Akimaliev, Chairman of CACAARI |
| 10:00-10:10 Briefing objectives of the Brainstorm Meeting by Dr. Alisher Tashmatov, Executive Secretary, CACAARI |
| 10:10-11:40 Presentation of Participants & Statements  
of ICRA (EIARD-FSTP project) by Dr. Jon Daane  
of FTTP programme  
of FAO OEKR  
of IFPRI ASTI programme by Dr. Gert-Jan Stads  
of YPARD by Ms. Courtney Paisley  
of CIMMYT by Dr. Alexey Morgounov  
of GFRAS by Vugar Babayev  
of USAID by Mr. Alexander Kalashnikov |
| 11:30-12:00 Coffee-Break and Group Photo |
| **Session 2. Chairman: Dr. Gayane Sarkisyan, Armenia** |
| 12:00-12:10 Continuations of Statements  
of Dr. Robin Bourgeois, GFAR, senior expert for Foresight and Development policies  
of Derek Russell, AGRINATURA  
of Dr. Ewa Wietsma-Łącka, Wageningen University  
of TICA by Mr. Ilkhom Mirzakulov |
<p>| 12:10-12:30 Presentation on Key Messages from GCARD1 Road Map for CAC by Academician Djamin Akimaliev, CACAARI, Chairman |
| 12:30-13:00 “CGIAR Research Programs and their implications to Central Asia and the Caucasus”. Presentation by Dr. Josef Turok, Head CGIAR Program Facilitation Unit |
| 13:00-14:30 Lunch |
| <strong>Session 3. Chairman: Academician Asad Musaev, Azerbaijan</strong> |
| 14:30-15:00 Transforming AR4D in CAC. Presentation of Draft Regional Strategy for |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>15:00-16:15</td>
<td>Presentations of national-level discussions of the Regional Strategy, by CACAARI National Experts</td>
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<tr>
<td>16:15-16:45</td>
<td>Coffee Break</td>
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<tr>
<td>16:45-17:30</td>
<td>Discussion on Regional Strategy and elaboration of recommendations for Transforming and Strengthening the Agricultural Research and Innovation System</td>
</tr>
<tr>
<td>17:30-17:45</td>
<td>Summary and close of Day 1</td>
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<tr>
<td>18:30</td>
<td>Dinner</td>
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<td></td>
<td><strong>Day 2, Wednesday, 30/11/2011, Tashkent</strong></td>
</tr>
<tr>
<td>09:00-09:15</td>
<td>Opening and summary Day 1</td>
</tr>
<tr>
<td>09:15-09:45</td>
<td>Need for M&amp;E strategy to transform ARD, including investments, methodology and outputs of cooperation. Presentation by Dr. Gert-Jan Stads</td>
</tr>
<tr>
<td>09:45-11:15</td>
<td>Discussions on M&amp;E of the regional transformation strategy</td>
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<tr>
<td>11:15-11:45</td>
<td>Coffee break</td>
</tr>
<tr>
<td>11:45-12:15</td>
<td>Presentation on Strengthening Agricultural Information System (RAIS) to contribute to agricultural research and innovation by Dr. Levon Chabonyan, Georgia</td>
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<tr>
<td>12:15-13:45</td>
<td>Lunch</td>
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<tr>
<td>13:45-14:15</td>
<td>Opportunities for mutual beneficial cooperation with European For a and research centers - presentation by Dr. Derek Russell</td>
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<tr>
<td>14:15-14:45</td>
<td>Role of Agricultural Research for Development in Agricultural Innovation Systems - Presentation by Dr. Jon Daane, ICRA</td>
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<tr>
<td>14:45-15:15</td>
<td>“Capacity Development for Analysis and Strengthening of Agricultural Innovation Systems (AIS) in Central Asia and Turkey” project implementing under FTPP and its current outputs - Presentation by Dr. Julien De Meyer, FAO/OEKR research officer</td>
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<tr>
<td>15:15-15:45</td>
<td>Coffee break</td>
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<tr>
<td>15:45-16:15</td>
<td>Presentation of AIS Case study “Boosting poultry in Samarkand region, Uzbekistan” by Dr. Botir Dosov on behalf of Dr. Khasan Mamarasulov, NC of FTPP project</td>
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<tr>
<td>16:15-17:15</td>
<td>Group work: Identifying and prioritizing immediate activities to initiate implementation of the Regional Strategy</td>
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<tr>
<td>17:15-17:35</td>
<td>Identifying and prioritizing immediate activities to initiate implementation of the Regional Strategy: Plenary session to present and summarize the results of the group work</td>
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<tr>
<td>17:35-17:40</td>
<td>Briefing on the field visit to Samarkand</td>
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<td>17:40</td>
<td>Close of Day 2</td>
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<td>19:15</td>
<td>Dinner</td>
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<tr>
<td>Time</td>
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<tr>
<td>06:15-07:15</td>
<td>Pick-up from Hotel, transportation to the Train station and boarding the train Tashkent-Samarkand</td>
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<tr>
<td>07:35-11:15</td>
<td>Transportation to Samarkand</td>
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<tr>
<td>11:15-13:00</td>
<td>Arrival in Samarkand, and accommodation in Regal palace Hotel</td>
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<tr>
<td>13:00-14:30</td>
<td>Lunch</td>
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<tr>
<td>14:00-14:45</td>
<td>Departure to Samarkand district / Field visit</td>
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<tr>
<td>14:45-15:45</td>
<td>Visit to private shop selling inputs, equipment and veterinary products for agricultural production</td>
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<tr>
<td>16:15-18:00</td>
<td>Visit to Joint Venture &quot;Agalyk-Lohmann-Parranda”. Discussions involving the Director of this Joint Venture (also Chair of the Samarkand Poultry Producer Association), the Director of Joint Venture “Marokand Parranda”, the Chair of Mahalla community farmers and a farmer representative involved in poultry production.</td>
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<tr>
<td>18:00-18:30</td>
<td>Departure to Regal Palace Hotel</td>
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<td>19:00</td>
<td>Dinner</td>
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**Day 4 - Friday, 02/12/2011, Samarkand**

**Session 9. Chairman: Dr. Khasan Mamaramasulov / Dr. Tashmatov, Uzbekistan**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>09:00-09:15</td>
<td>Opening and summary Day 3</td>
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<tr>
<td>09:15-10:00</td>
<td>Presentation of Agricultural Research with emphasis on Samarkand Agricultural Institute’s collaboration with the poultry sector by Mr. Davlatov Ravshan, Vice Rector of Samarkand Agricultural Institute (SAI)</td>
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<tr>
<td>10:00-10:30</td>
<td>Presentation on broiler production and innovative production technologies in Uzbekistan by Dr. Yusuf Ermatov, Associate Professor of poultry and broiler production, SAI</td>
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<tr>
<td>10:30-11:00</td>
<td>Presentation of ‘Poultry’ AIS Poster by Dr Khasan Mamaramasulov, Executive Director of Scientific Innovation Centre, Ministry of Agriculture and Water Resources, Uzb.</td>
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<tr>
<td>11:00-11:30</td>
<td>Coffee-break</td>
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**Session 10. Chairman: Academician Mohtasim Akhmedov, Azerbaijan**

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:30-12:00</td>
<td>Presentation of AIS poster from Armenia by Mr Andranik Petrosyan</td>
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<tr>
<td>12:00-12:30</td>
<td>Presentation of AIS poster from Georgia by Academician Guram Aleksidze</td>
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<tr>
<td>12:30-13:00</td>
<td>Presentation of AIS poster from Kazakhstan by Mr Aljan Shamshidin</td>
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<td>13:00-13:10</td>
<td>Presentation of AIS poster from Turkmenistan by Dr Murad Bayramov</td>
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<td>13:10-14:30</td>
<td>Lunch</td>
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**Session 11. Chairman: Dr. Asanbek Ajibekov, Kyrgyzstan**

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<th>Time</th>
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<tr>
<td>14:30-15:10</td>
<td>Plenary discussion on AIS posters</td>
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<tr>
<td>15:10-16:30</td>
<td>Group work: Creating Conducive Policy and Institutional Conditions for Integrating Agricultural Research for Development with Smallholder Innovation in the CAC-region and Proposing Follow-up Activities – Facilitators: Jon Daane, Elizabeth Katz and Julien de Meyer.</td>
</tr>
<tr>
<td>16:30-17:00</td>
<td>Finalising Group reports</td>
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<tr>
<td>17:00-17:30</td>
<td>Presentation of Group reports, discussion and synthesis of follow-up actions agreed – Résumé, Dr. Jon Daane</td>
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<tr>
<td>17:30-17:45</td>
<td>Closing</td>
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<tr>
<td>18:30</td>
<td>Dinner</td>
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<td>09:00-13:00</td>
<td>Sight-seeing</td>
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<td>13:00-14:30</td>
<td>Lunch</td>
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<tr>
<td>14:30-17:00</td>
<td>Sight-seeing</td>
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<tr>
<td>17:00-22:00</td>
<td>Departure and travel to Tashkent</td>
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Minutes of the Regional Brainstorm meeting

Day 1 – 29/11/2011, Tashkent, Hotel Dedeman

Chairman: Academician Djamin Akimaliev – Chairman of the Steering Committee of CACAARI

Opening Session and Welcome Statements

Ministry of Agriculture and Water Resources of Uzbekistan: Rustam Ibragimov - Head of External Relations Department of MAWR RUz welcomed all participants to the regional brainstorm meeting, stressing the importance of the integration of innovation systems in the AR4D. He wished all the participants of the meeting every success and fruitful work. In his speech, he expressed the view that the regional meeting will be an important event for the agricultural sector in Central Asia and Caucasus.

Global Forum for Agricultural Research (GFAR): Mark Holderness - Executive Secretary GFAR stressed the important role of CACAARI strengthening of AR4D in CAC region. As the Association it brings together all stakeholders in eight countries in the same direction for the transforming of the national agricultural research and innovation systems, trying to create a common platform to discuss issues, make recommendations on the goals and objectives of the GCARD2010 Roadmap to increase the productivity in agriculture in the region.

Regional Program for Sustainable Agricultural Development in Central Asia and the Caucasus: Dr. Jozef Turok - Head of PFU-CGIAR, Regional Coordinator of ICARDA-CAC - welcomed all participants to the regional meeting and noted the importance of this meeting in the region. He mentioned that this platform becomes particularly relevant in a changing climate, the threats of transboundary diseases.

Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI): Chairman CACAARI: Academician Djamin Akimaliev - thanked all the participants, organizers and guests of the Regional Meeting on behalf of the CACAARI Steering Committee. In his speech he noted that at present the agricultural research and innovation system must play a key role in increasing of agricultural productivity, improve living standards in rural areas. The traditional approach in agricultural research is no longer appropriate to address the existing issues of food security, climate change and population growth. The agricultural research and innovation system should be reshaped, and transformed into an effective mechanism for decision-making to meet the needs of agriculture and population, especially the poor.

Then, the chairman gave the floor to the CACAARI Executive secretary – Dr. Alisher Tashmatov

Dr. Tashmatov welcomed all participants, and reminded that this event was jointly organized by financial contributions of GFAR/CACAARI and EIARD/ICRA and administrative support of ICARDA. There are also representatives of FAO/Turkey Partnership Programme, FAO OEKR, IFPRI / ASTI programme, YPARD, CIMMYT, GFRAS, USAID, TAIC, GIZ, Ministries of Agriculture, Academies of Science, Research Institutes, NGOs, Universities of CAC countries and others.
Then he briefed the goals, objectives and expected outcomes of the brainstorming.

**The Goal:**
- The review and discussion of the issues of transforming and strengthening of Agricultural Research and Innovation Systems in CAC region in accordance with GCARD Road map and specific features and challenges in agriculture

**Objectives:**
- The review and discussion of the draft Regional strategy
- Discussion of national reports of AR4D transformation
- Allowing high-level decision makers to be exposed to the potential impact on smallholder livelihoods that can be gained from better integration of AR4D with smallholder innovation, and by policies and institutional arrangements that favor such integration.

**Programme**

**Day 1**
- Introduction to key messages from GCARD1 Road Map (for CAC)
- Discussing the CGIAR Research Programs and their implication to CAC region
- Discussion of Draft Regional Strategy for Transforming and Strengthening the Agricultural Research and Innovation System and elaboration of recommendations for Transforming and Strengthening the Agricultural Research and Innovation System

**Day 2**
- Review and discussion of M&E of the regional transformation strategy
- Discussion and working out recommendations for strengthening Regional Agricultural Information System (RAIS) to contribute to agricultural research and innovation in CAC region
- Increase awareness about existing opportunities for mutual beneficial cooperation with European Fora and research centers
- Identify implications of the integration of ARD in AIS for the national and regional strategies
- Case study, i.e. Boosting poultry in Samarkand region, Uzbekistan, recommendations for appropriate applications to the CAC region and further improvements
- Group work to identify implications of the integration of ARD in AIS for the national and regional strategies (institutional and policy changes, investment,

**Day 3**
- As an example of poultry in Samarkand region, Uzbekistan, study of successful experience, and the integration of innovation and Agricultural Institute of Agribusiness and rural communities and farms
- Observing the production capacity of Joint Venture “Agalyk-Lohmann-Parranda”, Field visit to poultry farms, households and other poultry entities (Including all stakeholders, processors, traders, retailers etc.)
• Review and discussion of regional (Samarqand) poultry production status, condition, government support, including institutional assistance, and provide recommendations for boosting poultry production
• Presentation and discussion of country AIS posters
• Group work to identify challenges in creating a policy and institutional environment conducive for ARD in the CAC-region and propose resolutions for follow-up

The chairman thanked CACAARI Executive secretary, Dr. Tashmatov for the information, and gave the floor to the other participants:

On behalf of **ICRA,** Jon Daane - Consultant ICRA thanked for the invitation of CACAARI to cooperate and participate in this process. He used the slide show presentation in narration his statement. In his presentation he noted that CGARD Road map is a “road map for transforming and strengthening AR4D”, and CACAARI is like a “passenger car” driving down this road towards these transformations goals. This process/transition is guided by the Regional strategy. To support the strategy formulation, GFAR has put some “fuel” in the CACAARI car. One of the milestones in this formulation is the Brainstorm meeting. Independent from these initiatives, EIARD had commissioned ICRA to implement a workshop in Asia for decision makers on “Good practices for integration of Agricultural Research for Development into the wider development agenda”. The funds for this workshop provide additional “fuel” for transforming AR4D in the CAC region at the present part of the road to organize field visits within the Brainstorm meeting Agenda. The Poultry case study initially investigated within the AIS project of FAO/Turkey partnership project is considered as a core case study to be deeply learned during the Brainstorm meeting. There are also four Agricultural Innovation Systems cases (from Armenia, Georgia, Kazakhstan and Turkmenistan) to be presented and discussed during the Regional Brainstorm meeting. Those innovation systems will be presented in form of Posters. Thus, all five case studies should illustrate Good practices of integrating AR4D into Smallholder Agricultural Innovation. Then we plan to discuss implications of these good practices for the Regional Transformation of AR4D.

On behalf of **the FAO (Office of Knowledge Exchange, Research and Extension), Julien De Meyer,** welcomed all participants and thanked CACAARI for cooperation in the project FAO and Turkey Partnership Programme (FTPP), and noted on his presentation, scheduled for the next day. He also briefly noted that there are three dimensions of challenges and opportunities of Capacity Development to Strengthen Agriculture Innovation for Smallholders: Enabling Environments, Organizational and Individual. The social aspects of integration of AR4D in smallholders innovation is very important and we have to discuss how agricultural research can facilitate the process of such innovations.

**Gert Jan Stads on behalf of IFPRI** covered the issues that were currently being considered in IFPRI. He also introduced his presentation scheduled for the next day by saying that CACAARI, linking with the technical expertise and experience of the Agricultural Science and Technology Indicators (ASTI) team led by the International Food Policy Research Institute (IFPRI), is now planning to launch a survey in the 8 countries of CAC to create a self-sustaining database of national capacities and public agricultural R&D investments across the region, which will inform the GCARD 2012 and show how institutions in Central Asia/Caucasus region are themselves working to strengthen and transform their roles.
Courtney Paisley representative YPARD - Platform for young professionals in AR4D presented general information about YPARD and its activity. She pointed to the tendency of reduced youth involvement in AR4D.

Academician Djamin Akinaliev commenting the statement of Courtney Paisley (YPARD), remarked that the low rate of salary in national Research Institutions reduces the motivation of youth to deal with agricultural research system at present time. Underfunding of the CAC AR4D negatively influences this part of the system as well.

Alexey Morgounov, representative of CIMMYT, stressed the importance of innovation system in AR4D, and mentioned that in some countries, reforms have not occurred, some countries are left behind. And at the same time he noted the Central Asian countries, such as Kazakhstan and Uzbekistan, which increased the potential for agricultural production, for example, in the grain sector. He then gave general information about CIMMYT, the achievements in the field of AR4D, innovation systems in countries such as India, which have been created and developed with the assistance of international organizations like CIMMYT in partnership with local authorities. He emphasized that CIMMYT is ready to cooperate with the countries of the CAC region in achieving efficiency in AR4D.

Mr. Vugar Babayev represented GFRAS, and briefed participants on the Resolutions of the 2nd GFRAS Annual Meeting:

- Share experiences through networking mechanisms such as web-based fora, national platforms, and regional and global meetings;
- Support efforts to advocate for a functional, innovative and demand-led extension system from national to global level;
- Promote professionalisation and incentivisation of extension advisors
- Identify, synthesise, and share quality material, innovative practices, roster of experts, directory of extension services, and other resources for advisory services in a “one-stop shop”;
- Seek to fill gaps in knowledge on effective approaches and policies, age and gender issues, and on ICTs-4-RAS;
- Be responsive to demands from the GFRAS constituents for supporting revitalized advisory services;
- Recognise pluralistic extension and advisory services as vital components of the extension system and strengthen their capacity to contribute to the larger agricultural innovation system.

Alexander Kalashnikov, a representative of USAID, agreed with views of previous speakers, that extension system has crucial importance in agricultural value chain. He expressed the readiness of USAID to support such projects, in order to contribute to regional development.

The chairman thanked all the speakers, and announced a coffee break, and then asked all to gather for group photo. After a coffee-break there was a group photo.

After a coffee-break Session 2 was chaired by Dr. Gayane Sargsian of Armenia.
She gave the floor to Dr. Robin Bourgeois, GFAR, senior expert for Foresight and Development policies, he briefed about the Global foresight Hub: the role of GFAR in promoting forward thinking in AR4D.

Then the floor was given to Derek Russell, representing AGRINATURA, after his greeting, briefly spoke about «AGRINATURA», which was the subject of his speech, scheduled for the second day of the meeting.

Chairman gave the floor to Dr. Ewa Wietsma-Łącka, Wageningen University, Department of Environmental Sciences, who gave brief information about collaboration between CAC and EU agricultural universities.

Ilkhom Mirzakulov representative TICA, presented the General Information about TICA and its activity. He said that TICA is the only organization that provides technical assistance to the country in coordination Turkish investment and Technical assistance. He is also on behalf of TICA expressed readiness of the Turkish agency to support such projects for the overall development of the CAC.

Then Chairman gave the floor to Academician Djamin Akimaliev, CACAARI, Chairman to make Presentation on Key Messages from GCARD1 for CAC.

Academician Djamin Akimaliev in his Presentation on Key Messages from GCARD1 Road Map for CAC region highlighted the Major challenges in transformation of AR4D in CAC region:

At the national level:
   1. A lack of political commitment to invest in AR4D
   2. Inadequate attention to the many contextual factors required and problems
   3. A poor linkage between research processes and the development agenda
   4. A lack of involvement of all relevant stakeholders in agricultural research
   5. The difficulty of defining national AR4D priorities and actions

At the regional level:
   1. The difficulties encountered in integrating actions at regional level
   2. Under-resourced regional organizations and networks
   3. A lack of wider international political commitment to support sharing of technological innovations

He also proposed enabling opportunities for transformation of AR4D in CAC region:
At the national level:
   1. Renewed recognition in government policies of the role of agriculture development
   2. Growth of ICTs and new roles of advisory services
   3. Growing inclusion in markets and strengthening of small rural-based enterprises, and their access to the market.

At the regional level
   1. Integrated regional policies to improve collective actions
2. Regional forum of CACAARI
3. Collective actions addressing shared challenges on a larger scale.

The main objectives in transforming of AR4D system in CAC region (and based on the GCARD Road Map) are:

1) identifying the main priorities of agricultural research as determined by the needs of science and society at national, regional and global levels;
2) 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;
3) expenditure increase to finance development of improved systems for agricultural research, education and consultation;
4) development of the human and institutional capacity required for the generation of relevant agricultural knowledge, and linkage with its users, and achievement of new results;
5) integration of innovation activities with goals of development program and policy;
6) demonstrate efficiency of measures taken by monitoring and evaluation, and reporting.

The acceptance of the “Road Map” by the GCARD 2010 Conference provided a launch-pad for all forums, including ours, to construct their own regional strategies.

Considering specific needs of the CAC region and priorities in AR4D transformation, a group of 8 national experts, each representing one of the 8 countries of CAC, formulated a draft Regional Strategy on transforming agricultural research and innovation systems. The group was assisted by a CACAARI Technical Consultant. The draft strategy takes account of contributions of all stakeholders in the various countries. This draft strategy translates the Road Map to the unique needs of the region.

Then the chairman gave the floor to Dr. Josef Turok, Head CGIAR Program Facilitation Unit to make the presentation on “CGIAR Research Programs and their implications to Central Asia and the Caucasus”.

Dr. Josef Turok presented the activities conducted in the region and its outputs.

- 5 training courses held in the Region
- About 120 researchers received short and long term training
- More than 1000 people participated in various farmers’ field days, farmers’ fairs, traveling workshops, farmers' schools and demonstration activities
- Scientific and technical publications
- Dissemination through exhibitions, presentations, interviews
- Shared media: CAC-News, posters, leaflets, website
- Collaboration with Tashkent State Agrarian University

He noted that the CGIAR Strategy will be implemented through a portfolio of CGIAR Research Programs (CRP) that:

- represent a coherent agenda at the system level, integrating food, environment and policy issues
• constitute almost the entire research agenda of the CGIAR, with each CRP designed to link to the other CRPs
• encompass strategic partnerships, coordination and integration of activities and a clear focus on results for impact.

He also explained objectives of CRP1.1: Integrated Agricultural Systems for the Poor and Vulnerable in the Dry Areas, and its Target Impacts:
• Higher, more stable incomes; improved security of rural assets
• Improved crop and livestock productivity; reduced variability in dryland systems productivity
• Improved nutrition security, especially amongst women and children
• Environmental degradation reduced and productive quality of environmental resources improved and maintained.

Strategic Research Themes (SRTs) are:
• SRT1: Approaches and models for strengthening innovation systems, building stakeholder innovation capacity and linking knowledge to policy action
• SRT2: Reducing vulnerability and managing risk = most vulnerable systems
• SRT3: Sustainable intensification for more productive, profitable and diversified dryland agriculture with well-established linkages to markets = high potential systems
• SRT4: Impact assessment and cross-Regional synthesis to provide evidence to promote investments in dry areas.

The Implications and perspectives are:
• Strong partnerships with NARS will remain critical
• An integrated approach to research through CRPs
• ARD priorities: Soil salinity and diversification
• Public policies must support improvements
• Farmers are open to new approaches and innovations
• Potential of the Human Resources capital available in the CAC Region
• Collaboration between Centers and NARS will mainly come through the CRPs but opportunities will continue through special funded regional and bilateral projects
• Announced funding from the Russian Initiative.

Dr. Mark Holderness, commenting on the speech of Dr. Turok said that CACAARI is an organization that should be involved in the process of adapting these programs in the CAC.

Executive Secretary CACAARI, Dr. Tashmatov commented the participation of CGIAR centers in the implementation of research themes. He noted that four CGIAR centers are involved in CACAARI. He, in short, said the heads of major international institutions (ICARDA, IFPRI, AVRDC) sent their messages for the Regional Meeting. He also noted that 2 copies of the Regional Strategy were handed out to each participant, and that one of them must be returned to CACAARI with written comments and suggestions.

Academician Bobo Sanginov, commenting the presentations by Academician Akimaliev and Dr. Turok, called for a more in-depth examination of the mentioned problems and related issues of
agriculture from the science point of view of. He stressed that the main goal is to improve people's welfare.

Dr Bayan Alimgazinova (Kazakhstan) appreciated the activities of CGIAR centers for their participation in AR4D in CAC. She noted that the issues of diversification are very important in particular in Kazakhstan, where processing of wheat is performed in recent years by "deep" method. She also recalled the need to diversify. In addition, the introduction of resource-saving technologies in agricultural production is very important.

After the lunch Session 3 was chaired by Academician Asad Musaev of Azerbaijan. He gave the floor to Dr. Botir Dosov, CACAARI, Technical consultant to present the Draft Regional Strategy for Transforming and Strengthening the Agricultural Research and Innovation System in CAC.

Dr. Dosov stressed that transforming and strengthening of AR4D in the CAC aligns with the six principles of the GCARD1 Roadmap, and suggests strengthening of all its constituent elements: (i) innovative research, (ii) education and capacity building, (iii) extension services that should be accompanied with development of ICTs. Implementation of these set tasks is impossible without adequate participation of all stakeholders, and particularly without due government attention and increased investments in agricultural research and innovation.

It was suggested to increase investments in AR4D up to 1% of gross agricultural output by 2015, up to 2% by 2020, and up to 3% by 2025.

The full package of measures on transformation of agricultural research and innovation systems is proposed to be undertaken in three phases, each of which is to be accompanied by assessment of the activities, and of the goals achieved with implementation of lessons learnt for future activities:

- Short-term phase 2012-2013;
- Medium-term phase 2014-2015;

In each phase of the transformation process a number of proposed actions should be implemented. Those proposals presented in this draft of a regional framework are to be discussed by all stakeholders.

It was also proposed to identify by collective discussions:

- required activities;
- resources necessary to implement these activities;
- expected outputs and outcomes from the implementation of each activity;
- those responsible for the implementation of each activity;
- implementation timeframe for each activity;
- mechanisms/tools for monitoring and evaluation of each activity.

The development of an efficient agricultural research and extension system to address the needs of farmers and other actors of the agricultural sector is considered as important factor for the reorientation of CAC region smallholder farmers towards markets, their income diversification, and contribution to environmental protection and adaptation to climate change.
The development of innovation systems in the region is considered as a necessary condition for protection from crisis situations and enhancing agricultural productivity. Promoting innovative activities of the agricultural sector will enhance not only the production chain, but also significantly improve the investment climate in agriculture.

At the end of his presentation Dr. Dosov concluded that negative impact of climate change on agriculture would exacerbate the already severe consequences of the global economic crisis. The expected population growth and urbanisation will increase demand for food and its price, which in turn will necessitate even greater use of limited natural resources. In case agriculture will develop without "required action", challenges of agriculture will turn into economic ones, and perhaps even into political issues, which may become a trigger for unstable civil and inter-ethnic situations. "Taking necessary measures" is thus a requirement for ensuring a peaceful and stable prosperous future in the CAC and "transformation" of the system of agricultural research and innovation for development is one of the most important requirements of this process when "all" should be acting as "one".

By the end of Dr. Dosov’s presentation Dr. Alimgazinova requested Dr. Dosov to clarify some statements of the Regional strategy. One of the objectives of the Regional strategy is “identifying the main priorities of agricultural research as determined by the needs of science and society at national, regional and global levels”. The question is identifying the main priorities of agricultural research as determined by the needs of “science and society” or by the needs “society and science”?

The answer was “society and science”. Then Dr. Vugar Babayev reminded participants that discussion of the Regional strategy was planned after the presentation of national discussions of Regional strategy.

Dr. Elizabeth Katz, International consultant for AIS FTPP project noted that in the list of research topics there is no topic for Agricultural Policy Research and asked Dr. Dosov to comment.

Dr. Dosov agreed with the remark, but he added that the Regional strategy was based on and synthesized the national strategies. And there are different views regarding including or excluding this topic. And we are here to discuss such issues. But, he expressed his own view, that this topic must be included, since aspect and content of the national agricultural policies crucially influence the changes in AR4D and agriculture as whole.

Dr. Jon Daane asked Dr. Dosov, What is the added value of the Regional Strategy relative to national strategies?

Dr. Dosov said that initially, the national AR4D identifies problems in areas of agriculture, examines needs and sets priorities at national level. Then, these needs are considered at regional and global levels respectively. In this way, the CAC countries are involved in the global process of shaping the agenda of international research for development, identifying common objectives to be pursued at the regional and national levels. Agreed action is necessary and important to enhance implementation impact of international development programs in the
region. In addition, there are many common issues in agriculture, such as cross-border diseases, food crisis, and climate change. And a team approach in developing an action plan provides benefits for problem solving. But it should be noted that the Regional strategy involves the peculiarities of each country.

Then, the Chairman opened the floor for presentation of the conclusions of the discussions of the Regional strategy at the national level.

**Armenia, National expert: Dr. Gayane Sargsyan:**
National Meeting on discussion of the Regional Strategy for Transforming and Strengthening of Agricultural Research and Innovation Systems for development was held on 14 November, 2011 in the State Agrarian University of Armenia. Participants of the national meeting listened to the presentation and shared views, and concluded to 1) exclude Annex 2.7 and Annex 8; and 2) give positive evaluation and approve the Regional Strategy.

**Georgia, Academician Guram Aleksidze** presented the agenda of the national discussion and noted the remarks of the participating national stakeholders:

- **Ministry of Agriculture**
  - majority of issues fully coincide with the strategy of Georgian Ministry of Agriculture, and they will work side by side with the International Organizations

- **Association of biological enterprise “Elkana”**
  - organic (bio, eco) agriculture or organic (bio, eco) agricultural production are not mentioned

- **Farmers’ House**
  - role of modern ICT is presented only in fragments

- **Federation of information technologies and documentations of Georgia**
  - add several points about food self-sufficiency of the countries and about identification of the correlation of production volume, created by small scale farmers, with large agricultural producers

- **National Academy of Science**
  - stress the difference between the countries of the region and opportunities to accomplish stated goals

- **Agrarian University of Georgia**
  - research restructuring, which mainly coincides with the processes that are occurring in the University during both educational and research processes
  - it is stressed that science management in Georgia is decentralized, official salaries of scientist are not prerogative of government

- **Georgian Agrarian Committee of Parliament**
  - Such a critical increase of the science financing (1-3%) from the government is doubtful, and is not discussed at the present time. The government with all strength will try to raise science financing.

- **Academy of Agricultural Science of Georgia**
  - their participation in agricultural research is unconvincingly interpreted
  - uniting International Organizations’ efforts in one direction or in one channel might be quite disputable
  - organizational forms of implementations are not mentioned
The strategy mentions financing of agricultural research based on a certain percentage of GDP. All this is true when the financing is realized by the government, but when private sector is included, such estimation seems to be unconvincing, as it is impossible to identify GDP of each individual party, and from this to get the percentage on research financing.

Kazakhstan, Dr. Bayan Alimgazinova gave a detailed presentation of the draft Regional Strategy for Central Asia and Caucasus, "Transforming and strengthening of agricultural research and innovation for development" in Kazakhstan (November, 2011). Many valuable suggestions for improving this document were presented.

Kazakhstan’s Proposals Resulting from Discussions of the Draft Regional Strategy:
The project aims at transforming the system of agricultural research in the region in order to create an innovative system within the CAC to:

- ensure food security,
- improving the socio-economic situation and wellbeing of the rural population,
- sustainable management of natural resources, etc.

Project goals and objectives are coordinated with the Millennium Development Goals and Roadmap GCARD1.

Emphasis is placed on the need to:

- orientate research, education system and innovations for the needs of farmers and other users of scientific products;
- create a mechanism for steering and coordination among donors;
- develop a system of monitoring, evaluation and demonstration of outcomes;
- attract private sector funds for AR4D;
- enhance the tax system to ensure financing for research activities;
- implement a system of motivation and incentives for researchers;
- ensure transition of the agricultural education system to a new level in terms of quality in line with the needs of innovative development, etc.

The conclusion from the analysis of Kazakhstan’s discussion of the draft Regional Strategy:

1. Draft Regional Strategy can be adopted taking into account the revisions based on recommendations from the panellists, including the Action Plan.
2. Need to develop Action Plans for countries to implement the regional strategy, taking into account the financial, organizational, and other resources.
3. Modified Regional Strategy should be delivered to governments of every country in the region and policy makers.
4. The key factors in successful implementation of the regional strategy are:
   - strong political support in each country;
   - adequate funding for all stakeholders of the innovation process;
   - broad involvement of consumers, farmers in all stages of development and innovation;
   - increase the agreed contribution of donor agencies in achieving the objectives of the strategy;
Kyrgyzstan, National expert, A.S.Ajibekov, doctor of agricultural sciences, professor informed that the National Meeting was held on 14 November, 2011, at the Kyrgyz Research Institute of Husbandry. Participants discussed the Regional Strategy on Transforming and Strengthening Agricultural Research and Innovation System. The Meeting was presided over by the academician Dj. Akimaliev. Professor A.S. Ajibekov, the National Expert, addressed the Meeting.

In total, 42 people participated at the National discussions from the Ministry of Agriculture of Kyrgyz Republic; State Committee on Land Reclamation and Water Resources; Kyrgyz National Agrarian University; Kyrgyz Research Institute of Livestock Farming and Pastures; Kyrgyz Research Institute of Veterinary named after A. Duisheev; Experimental Stations; Seed Farms; Agricultural Extension Service.

The Regional Strategy on Transforming and Strengthening Agricultural Research and Innovation Systems for development is an important policy paper, which interested all stakeholders to work further on improvement of agricultural research for improving welfare of agrarian countries were the population is predominantly rural and where agriculture forms the main share of the country’s GDP. This paper is really a cry from heart of agrarian scientists of the region – added professor.

CACAARI Consortium of Farmers’ Organization, M. Bayramov, Turkmenistan, informed that the National Meeting for discussion of the Regional Strategy for Transformation and Strengthening of Agricultural research and innovation systems for development was held on 25 November, 2011 in Ashgabat.

Discussing the Regional strategy, farmers concluded that the Regional Strategy mentions a lot about that Agricultural Research should be directed to the needs of farmers, besides that farmers should be involved in the process of transformation of the agricultural research and innovation systems. However, Regional Strategy rarely mentions about how farmers should participate in the processes of transformation, especially small scale farmers who are not able to invest in AR4D. How will farmers be involved in the process of AR4D transformation? How is AR4D oriented towards the needs of farmers? Where are the mechanisms? Moreover, the farmers should be involved not only in the process of AR4D transformation but also they should participate in formulating the program for AR4D. The investment level should be increased both in AR4D and agriculture as a whole. We should not tell to the farmers what to do, but we should ask them what to do for themselves. Regional Strategy should clearly state how farmers will be involved in these processes? HOW?

Consortium of Agricultural Universities of Central Asia and South Caucasus, Dr. Alim Pulatov, Executive Secretary, presented the activity of the Consortium and proposed actions to be undertaken in agricultural education:

- Improvement of national, regional, interregional and global cooperation;
- Initiation of interventions at the national, regional and global levels in partnership with other ARD stakeholders and through CACAARI;
• Organization of workshops and conferences on national and regional and international levels with the participation of Universities, Research Institutions, Farmers, NGOs and other ARD stakeholders;
• Creation of Regional Centers of Excellence with high quality of graduates (MSc and PhD), studies and support of academic mobility. The transfer of knowledge between Europe and CAC Region and within the Region;
• Development of Joint Master and PhD programs on regional and inter regional levels;
• Equipping and modernization of science laboratories;
• Development of integrated modern extension services in CAC countries with Universities and Research Institutions and Ministry of Agricultures;
• Development of training programs and modules for farmers (case studies);
• Sharing knowledge, experiences, expertise, and replicate successful practices and lessons learned in engaging with ARD, education and extension;
• Generation, documentation and dissemination the information, knowledge and skills relevant to ARD, education and extension;
• Development of a web portal to support information and knowledge sharing for scientists, researchers, graduate students, consultants, farmer organizations and farmers;
• Development of state of the art knowledge and provision of high-level education in natural resource management and agribusiness together with universities in the CAC region as a basis for economic development and environmental rehabilitation and protection (establishment of Top Institute in the region)
• Introduction of new approaches to a profitable agriculture that contributes to human wellbeing and environmental quality. Food has the prime focus, attention for biomass in relation to the production of energy and materials may be included
• Implementation of these approaches in an agroproduction complex that is financially self-sustaining (establishment of Agropark in the region);
• Development of technologies for effective use of water resources;
• Improvement of water management on basin and on-farm levels;
• Assessment of and protection against negative influence of agricultural inputs to water environment;
• Development of a comprehensive scheme of use and protection of water resources, transboundary and small rivers.

The chairman, thanked all speakers for such interesting information and presentation, then he announced that after a coffee-break the session 4 will be chaired by Academician Guram Aleksidze.

After coffee-break, **Academician Guram Aleksidze, Georgia**, chaired the Session 4. He stressed that discussions are very important for the region and Regional strategy.

The discussion of the Regional strategy has been very lively. The meeting participants addressed various aspects of the Regional Strategy, but the most debated issue was an increase in funding for agricultural research. In accordance with the Draft Regional Strategy in the CAC an increase of investments in AR4D is supposed to be up to 1% of gross agricultural output by 2015, up to 2% by 2020, and up to 3% by 2025. This caused a heated debate. However, most participants agreed that a 1% by 2025 would be more realistic.
At the end of Day 1, a reception dinner was organized, and all participants were invited.

**Day 2 – 30/11/2011, Tashkent, Hotel Dedeman**

On the second day of the Brainstorm meeting, Session 5 was chaired by Dr. Bayan Alimgazinova, Kazakhstan.

She summarized the Day 1, and then gave the floor to Dr. Gert-Jan Stads, IFPRI/ASTI.

**Dr. Gert-Jan Stads, IFPRI/ASTI** delivered the presentation on “Monitoring Agricultural R&D Investment and Capacity Trends in Central Asia and the Southern Caucasus”. In his presentation he explained why we should monitor the allocation of ARD resources, and what is the role of M&E in the CACAARI Regional Strategy and transformation of ARD.

He stressed that the Agricultural Science and Technology Indicators (ASTI) initiative is one of the few long-standing sources of global AR4D data and analysis. Led by the International Food Policy Research Institute (IFPRI), ASTI compiles, analyzes, and publicizes data on institutional developments, investments, and capacity trends in AR4D in low- and middle-income countries. Data collection, analysis, and dissemination are conducted through a long-established and experienced network of national, regional, and international AR4D agencies. As such, ASTI has the key expertise in house to coordinate the abovementioned regularized process of monitoring AR4D investments. CACAARI, linking with the technical expertise and experience of the ASTI team, is now planning to launch a survey in the 8 countries of Central Asia and the Caucasus to create a self-sustaining database of national capacities and investments across the region, which will be of benefit to all countries involved. The data that ASTI collects will form the basis for a series of country reports, a regional report, and a new global update on public agricultural R&D investment and capacity, which will inform the GCARD 2012 and show how institutions in Central Asia/Caucasus region are themselves working to strengthen and transform their roles.

He proposed the following timeline for the ASTI Survey in the CAC Region:
- December 2011 (currently in process): Setting up country collaborations / identifying country focal points
- December 2011: Agency lists (government, higher education, non-profit, private)
- January 2012: Disseminate survey forms (adding questions?)
- April 2012: Data collection finalized
- July 2012: Series of country notes, regional report
- November 2012: GCARD global update.

He also called on CAC countries to actively support the provision of relevant statistics.

Then issues of M&E in the Regional strategy were discussed.

During the discussion, participants were given the opportunity to understand certain items of questionnaires, which they could not understand.
After coffee-break, Session 6 was chaired by Dr. Murad Bayramov, Turkmenistan. He gave the floor to Dr. Levon Chobanyan, Georgia, TECHINFORMI, GFID.

Dr. Levon Chobanyan, TECHINFORMI, GFID delivered the presentation on strengthening the Regional Agricultural Information System (RAIS) to contribute to agricultural research and innovation. He stressed existing problems of ICT use for ARD in CAC region such as:

- Underfinancing of research
- Weak extension system
- Permanent organizational transformations in ARD systems
- ICT are available in the CAC region but their use for ARD is insufficient
- ARD systems do not lead in use of ICT for agriculture (in relation to other agricultural players).

He added that CACAARI had and still has to overcome significant organizational difficulties linked to reforms of agricultural research systems in the countries.

After lunch, Session 7 was chaired by Dr. Vugar Babayev, Azerbaijan. He gave the floor to Dr. Derek Russell, AGRINATURA, consultant for EFARD.

Dr. Derek Russell presented the Opportunities for Inter-regional collaboration. He introduced the ‘European Forum for Agricultural Research for Development (EFARD), described ARD networks in Europe and provided an overview of the EC’s 7th Framework Programme (FP7) research possibilities for the CAC region.

Then chairman gave the floor to Dr. Jon Daane, consultant for ICRA.

Dr. Jon Daane delivered the presentation on the Role of Agricultural Research for Development in Agricultural Innovation Systems. At the beginning of his delivery he stated that ICRA’s mission is to strengthen the capacities of people and organisations involved in development, research and education to jointly realise knowledge-based rural and agricultural innovation in support of the Millennium Development Goals.

He covered in his presentation: i) What is innovation? ii) New institutional arrangements for agricultural innovation; iii) New roles of Agricultural Research for Development (AR4D) in agricultural innovation systems; and iv) Strengthening innovation capacity.

He gave the very easy understanding and comprehensive definition that: “Innovation is the process by which social actors create value from knowledge”.

Next, the floor was given to Dr. Julien De Meyer, FAO/OEKR research officer to present the “Capacity Development for Analysis and Strengthening of Agricultural Innovation systems (AIS) in Central Asia and Turkey” project implemented under FTPP.

Dr. Julien De Meyer informed participants about the FAO global goals, research and extension vision and objective. He also briefly noted that there are three dimensions of challenges and opportunities of capacity development to strengthen agriculture innovation for smallholders: enabling environments, organizational and individual. Then he shared general information on
FTPP and the AIS project. Five countries are involved in the project: Azerbaijan, Kyrgyzstan, Tajikistan, Turkey and Uzbekistan.

The activities at the national level are:

i) Identify main actors of AIS
ii) Develop questionnaires and study outline
iii) Pre-study workshop
iv) Study AIS, specific cases, role of ICTs (interviews, workshop, etc.)
v) Analysis of data, incl. report and recommendations
vi) Post-study workshop
vii) Validated reports and recommendations by country
viii) Trained human resources.

The activities at the sub-regional level are:

i) Compare country reports & regional synthesis report
ii) Sub-regional workshop
iii) Validated sub-regional report
iv) Project outline to strengthen AIS
v) Network of AIS human resources.

After coffee-break, Session 8 was chaired by Academician Bobo Sanginov, Tajikistan. He gave the floor to Dr. Botir Dosov, who presented the AIS Case study “Boosting poultry production in Samarkand region” on behalf of Dr. Mamarasulov.

Dr. Dosov indicated why and how the poultry case study was selected and investigated. He also noted, that at present, egg production in the Samarkand region exceeds the needs of its population more than double. Poultry farmers of Samarkand region supply poultry products to neighbouring regions, as well as to the republic's capital, Tashkent. Poultry production is a cost-effective activity for smallholders, as well as for medium and large poultry farms. Despite the presence of the giant poultry farms, smallholders and dehkhan farms are main producers. Poultry farming allows obtaining different high-protein products: eggs, chicken meat and others.

He presented the value chain: foreign partners supply parents of high reproductive crosses to poultry (breeding) factories, which reproduce incubation eggs and final hybrids and sell to poultry factories, farms, (plant) processing enterprises. The latter then produce commercial chickens, eggs and meat for households consumption.

Then, there was group-discussions on the implications of the integration of ARD in AIS for the national and regional strategies (institutional and policy changes, investment, etc.). Identifying of implications of the integration of ARD in AIS for the national and regional strategies.

At the end of the second working day of the meeting Dr. Tashmatov gave a brief summary of the further meeting in the Samarkand region.

Day 3 – 01/12/2011, Samarkand
On the third day, participants travelled to Samarkand by train and reached the Hotel Regal Palace at noon, where they dined.

In the afternoon, the group was accompanied by the Hakim (Governor) of the Samarkand district and a representative of the Ministry of Agriculture in the Samarkand region. The group visited the shop «Mahsus savdo», which sells most necessary materials and resources for agriculture (fertilizers, vaccines, feed additives) and provides advisory services to farmers and rural residents.

Participants then went into the territory of large private poultry farm "Agalyk-Lohmann-Parranda". The "Agalyk-Lohmann-Parranda" is an agricultural (poultry) enterprise, a joint venture between the German multinational livestock company Lohmann and a privatized former State farm, which in the soviet days had imported the crosses and production technologies developed by the Russian Poultry Research Institute (VINITIP).

Having the status of breeding farm, Agalyk-Lohmann-Parranda imports parents of high reproductive crosses from Germany into the Republic of Uzbekistan and to date produces more than 70% of the incubation eggs and final hybrids supplied to incubators, other large poultry enterprises and professional farms producing eggs and meat for commercial purposes in the Samarkand Region. Poultry enterprises and professional farms can buy both incubation and commercial eggs and chicks. The latter are highly demanded by dehkhan farms for reproduction and backyard production. The poultry enterprises and professional farms sell their products to public organizations that prepare meals, e.g., hospitals and schools, and to other businesses, such as bakeries, confectioners, restaurants, hotels, grocery stores, minimarkets and supermarkets in regional towns and in Tashkent. Dehkhan farms mostly sell their products in local markets or to wholesale buyers at the farm gate.

To demonstrate the scientific, production and commercial activities of the Agalyk-Lohmann-Parranda participants watched a video film about the company.

The meeting with participation of poultry farmers, heads of poultry enterprises, heads of local communities, officials of regional and district government was organized at the administrative building of Agalyk-Lohmann-Parranda. The Director-General of "Agalyk-Lohmann-Parranda" is also the chairman of the regional association of poultry farmers.

Chairman of the Association of Poultry Farmers of Samarkand region, emphasized that considerable support is received from the local government. Local authorities also support this process and strongly contribute to its development. Currently, a service to provide vaccines, remedies and prevent diseases of poultry is being set up. A sanitary-epidemiological service is established. This practice demonstrates the innovation in the poultry industry and the cooperation between research and government structures.

The leaders of local communities pointed to the socio-economic effects of this innovation. Its impact on well-being of rural people, most of which are occupied by poultry, young people's desire to get agricultural education, etc.
After the presentations, speakers answered questions.

**Day 4 – 02/12/2011, Samarkand, Hotel Regal Palace**

The fourth day of the Regional Meeting was held in the Conference Hall of Hotel Regal Palace. **Dr. Tashmatov** chaired Session 9 instead of **Dr. Mamarasulov**.

**Dr. Tashmatov** summed up the previous day and introduced the new participants. They are Dr. Davlatov Ravshan, Vice Rector of Samarkand Agricultural Institute (SAI), and Dr. Yusuf Ermatov, Associate Professor of poultry and broiler production, SAI, as well as Specialists of Foreign relation department, SAI.

Commenting the presentations of the day before by speakers at the poultry factory Agalyk-Lohmann-Parranda, the chairman noted that this experience of integration of AR4D, agribusiness, and innovation is the most remarkable example of creating an enabling environment by the State, the Regional government, and the Regional Department of Agriculture and Water Resources. Government support and creating favourable conditions for development of poultry in the region are essential components of the success of this integration.

Then he gave the floor to **Dr. Davlatov Ravshan, Vice Rector of Samarkand Agricultural Institute (SAI)**.

**Dr. Davlatov Ravshan** delivered the presentation of Agricultural Research with emphasis on Samarkand Agricultural Institute’s collaboration with the poultry sector.

He gave general information about Samarkand Agricultural Institute, and then stressed the collaboration between research and production. Samarkand Agricultural Institute cooperates with the Agalyk-Lohmann-Parranda for human resource and technology development. Almost 75% of the administrative, scientific, technical and support staff and workers of the joint venture are alumni of Samarkand Agricultural Institute. The cooperation contributes to improving productivity, mechanization, nutrition, feed processing, housing and packaging, animal health, and meat and egg processing.

Samarkand Agricultural Institute carries out scientific and research work in poultry farms in the following areas:

- New technologies for growing chicks and young hens;
- New technologies for breeding and fattening of broiler chicken;
- Experiments to improve the housing of the birds;
- Experiments on the development of balanced nutrition and metabolism;
- Development of chemo- and immune prophylaxis and treatment of parasitic diseases of birds (coccidiosis, ascariasis, etc.).

Together with colleagues from the Research Institute of Veterinary Medicine, researchers have been working to improve methods of prevention of infectious diseases of chicken, such as Newcastle disease, infectious bronchitis, Gambero disease, infectious laryngo-tracheitis,
reductions in egg production syndrome, smallpox, etc. Poultry scientists also conduct research to develop effective methods and means for the prevention of associated forms of parasitic and bacterial infections (colibacteriosis, pulloroz-fever, salmonella, etc.).

Dr. Yusuf Ermatov, Associate Professor of poultry and broiler production, SAI delivered the presentation on broiler production and innovative production technologies in Uzbekistan.

He informed participants the new technologies developed for poultry, and specifics of the poultry production in Uzbekistan. These technologies stipulate economic and social aspects as well. He answered the participants’ questions related to mechanization, nutrition, feed processing, housing and packaging, animal health, and meat and egg processing.

Further, the work of the meeting was devoted to presentations and discussion of posters describing agricultural innovation systems. The Chairman gave the floor to Dr. Hassan Mamarasulov for poster presentation on "Poultry in the Samarkand region" of Uzbekistan.

After the coffee break, Dr. Mohtasim Akhmedov, Azerbaijan, chaired Session 10. He in turn gave the floor for presentation of posters from Georgia, Armenia, Kazakhstan and Turkmenistan.

Presentation of AIS poster on Development of Aquaculture in Armenia, by Mr Andranik Petrosyan.

Presentation of AIS poster on Private Breeding and Seed supply in Georgia, by Academician Guram Aleksidze.

Presentation of AIS poster on Large-scale Production of Veterinary Test-kits for Diagnosing Serious Diseases in Animals in Kazakhstan, by Dr Aljan Shamshidin.

Presentation of AIS poster on Innovative Irrigation Technology in Turkmenistan, by Dr. Murad Bayramov on behalf of Dr. Saparmuradov.

Poster of Georgia (concerning the private firm, which plays a key role in breeding, multiplying and distributing wheat and maize) raised a lively and sometimes heated debate between those who were opposed to the private sector in basic seeds and those who advocated such a role.

After lunch Session 11 was chaired by Dr. Asanbek Ajibekov, Kyrgyzstan.

The session started with plenary discussion on the AIS posters, followed by working in groups on identifying Conducive Policy and Institutional Conditions for Integrating Agricultural Research for Development with Smallholder Innovation in the CAC-region and Proposing Follow-up Activities. The group work was facilitated by Jon Daane, Elizabeth Katz, Julien de Meyer and Botir Dosov.

Then the outcomes of their discussions were presented.

Group 1.
Examples of agricultural innovation
1. Production of broiler chicken (5-10,000 per farmer) (Uzbekistan)
2. Centers for growing chicks (1 day -1 month old chicks). (Uzbekistan)
3. The introduction of non-traditional crops, taking into account climate change (Armenia)
4. Agricultural Enterprise Lomtagora (Georgia)
5. Transplantation of embryos (Kazakhstan)
6. Increased milk production of goats at the foothills and mountainous areas, through the use of innovative approaches (Armenia)
7. Increasing the productivity of bees: a medicine (tablets) for the bees, the cultivation of plants (Armenia).
8. Potato seed production (Tajikistan.)
9. Yak breeding (high altitude regions of Tajikistan)

Why did we choose these examples?
1. There is a demand of users for agricultural scientific knowledge
2. The application of this knowledge allows:
   • Reduce the cost of production
   • Increases productivity
   • Increases profitability
   • Provides employment
   • Multiple-products
3. Developed and implemented in and for the existing conditions

What should be done?
1. The relevant laws should exist, work and be practical, and have to be comprehensive.
2. Enabling conditions (tax breaks, tariffs, incentives).
3. Funding
4. Activities aimed at changing mind-sets
5. Consumers’ request to the Government, Donors.

Regional Strategy
1. Should include:
   • Common interests (regional)
   • Private interests (national)

Group 2.

Agricultural Innovations
• Cooling aggregates of fruits and vegetable stores
• New dry fruit technology
• Sowing maize in between harvested grain rows

Description of example
Sowing maize in between harvested grain rows:
– Country Azerbaijan
- Seeder developed by research institute
- Gives 2 harvests
- Adoption by 10 pilot farms
- Higher yields.

Factors for implementation
- Seeder model comes from CYMMIT.
- Got seeder to try it and scientist went to CYMMYT to learn how to use it
- Successful, but now question where to get the seeder for wider use
- Demand is high
- Some farmers have imported from Turkey
- Needs leasing or credit program

Why we like the example?
- Brings a lot of benefits for small farmers
- International links between scientists to get new technologies into countries

Changes required
- Information and consultation services
- Encourage private companies to import the technology – develop market for such equipment
- Assist farmers in getting organized to use technology jointly
- Leasing or affordable interest rate program

Group 3.

Case studies:
- Increase of food production to improve the livelihood of smallholder farmers (poultry and fisheries)

What are the commonalities and why are these good examples?
- Close involvement of the local community
- Access to employment
- Increased production leads to food security
- Government provided a supportive enabling environment
  - Legal framework
  - Tax grace period (poultry)
  - Easy access to soft loans (registration)
  - Investment environment
  - Extension services provide information support and dissemination
  - Promotion of the technologies (fair)
  - Animal health services
  - Capacity building support (fisheries)
  - Pedigree breeding activities
- Private sector is involved
  - Capacity building support (poultry)
  - Facilitate access to genetic resources
• Provided investment in innovative technologies and infrastructure
• Provides soft loans.

- University - State agrarian university of Armenia, Samarkand Agrarian University
  • Provides specialized services to the production sites.

Institutional and policy changes needed to mainstream AR4D to involve smallholder farmers

- Policy and legal environment
  • Relevant decrees and resolution of the government were changed.
  • Resolution of the cabinet about contractual obligation
  • Drafting of a law on Cooperatives being setup

- Institutional
  • Increased funding and investment in applied research. Provide a system to recognize services from research institutions to smallholder farmers. (Fundamental research is funded by state, applied research is not fully funded)

- Private sector
  • Quality standards are set.

How can the regional strategy best ensure that these changes are made

• Donors, external actors promote regional collaborative work
• CACAARI sets up a platform for regional scientist to exchange ideas
• CACAARI organizes a workshop to disseminate the knowledge and experiences
• CACAARI should promote information exchange on and adoption of innovation from neighbouring states

The next day, participants were given an opportunity to see the sights of Samarkand. After lunch, participants returned to Tashkent by train.
## Annex 3.

### List of Participants
of the Brainstorm Meeting for Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region

November 29-30, 2011 - Tashkent, Uzbekistan, Hotel Dedeman  
December 01-03, 2011 - Samarkand, Uzbekistan, Hotel Regal Palace

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**Armenia**

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1. Poultry and poultry producers in the Samarkand Region

Samarkand Region is located in the Zarafshan Valley, in the center of the Republic of Uzbekistan. Its population is about 3.2 million people, of whom more than 0.4 million live in the city of Samarkand. Poultry production, which is currently mainly oriented to the
production of eggs\(^7\) is one of the developed sectors of the economy of the region. The Regional Government (Khokimiyat) strongly supports the expansion of the production of eggs and chicken, because of its cost-effectiveness and short payback period. As poultry products are rich in protein, the poultry sector is seen as a real contributor to the national food security policy and its development is considered essential for a healthy diet. The sector also provides job opportunities, thereby reducing unemployment. To date the regional production of eggs is more than twice the local consumption. Poultry farmers of Samarkand Region supply eggs to neighboring regions, as well as to the republic's capital, Tashkent.

In this case study, three types of poultry producers are distinguished, based on the three legal forms of agricultural production entities in Uzbekistan, which are also used in all agricultural statistics. These comprise\(^8\):

(i) **Dehkhan (дехкан) farmers.** These are usually part-time farmers operating household plots of not more than the legal maximum (ranging from 0.35 ha for irrigated land to 1 ha for the steppe). On average they farm 0.17 ha. They produce potatoes, vegetables, fruits, fodder and livestock, including poultry, for home consumption, but many also sell sometimes considerable surpluses to neighbors and on local markets. **Dehkhans** complement their agricultural revenue with income from wages, non-agricultural businesses and remittances. Although land ownership remains exclusively vested in the State, **dehkhan farmers** enjoy lifelong possession of their land and can bequeath it to their heirs. They are free to produce what they want and sell to whom they want;

(ii) **Professional farmers** (*fermerskie khozyaistva*, фермерские хозяйства) who conduct farming as a commercial business, work almost full-time on the farm and earn their income primarily from farming. They operate areas of 10-100 ha (on average 15 ha), of which on average two thirds is for commercial arable field crops, including wheat. They rent land (that was often formerly used by kolhoz, sovkhoz or state farms) from the State on contracts of 30-50 years that also specify the products to be delivered to the state order system. Some professional farmers also produce poultry on a commercial basis next to crops and other livestock;

(iii) **Agricultural enterprises.** These are incorporated and managed as private or public Joint Stock Companies (JSC). They are usually former state farms or cooperatives. The enterprises analyzed in this case study are mostly specialized in poultry. They comprise medium (100-300 thousand eggs per month) and large (up to 500 thousand eggs per month) poultry farms or factories\(^9\) and incubators.

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\(^7\) Production of eggs currently remains the main priority and activity, even though there is some meat production as well. For this reason this Case Study focuses on egg production.


\(^9\) In this case study ‘poultry farms’ and ‘poultry factories’ are used as synonyms to refer to specialized agricultural (poultry) enterprises.
Despite considerable differences in the level of technology used, egg production is a cost-effective activity for all three types of production units.

As indicated in Figure 1, despite the presence of large specialized poultry enterprises that, together, produce dozens of millions of eggs per year, the main producers of eggs are dehkhan farmers and professional farmers. The dehkhan produce chicken and eggs for home consumption and for sale in the local market. In 2010, in Samarkand Region, 573.9 million eggs were produced by all types of producers. The total amount of birds reached 4.6 million. For 2011, experts estimate that the number of birds will increase by 20%, while egg production will grow by 25%.

As shown in Figure 2a, Samarkand Region distinguishes itself by the considerably higher contribution that professional farmers make to the total regional production of eggs, compared to the share of this type of producer in the total national production. By contrast, dehkhan farmers in Samarkand make a relatively smaller contribution to regional production than such farms do in the national production. The share of agricultural (poultry) enterprises in the Samarkand regional production is not different from the share of this type of producer in the national production. These statistics can be read as an indication that professional farmers in Samarkand Region consider egg production to be a particularly interesting activity.
In addition, as shown in Figure 2b, all three types of producers in Samarkand Region produce more eggs per chicken than the national average for their category. This may be partly due to a stronger focus of the poultry sector in Samarkand Region on the production of eggs rather than meat. Nevertheless, the statistical fact that professional farms, and to a lesser extent also dehkhan farms, in Samarkand Region not only produce more eggs per chicken than the national average for these types of producers, but also more than the poultry enterprises in the Samarkand Region, are strong indications that professional farms and dehkhan farms use relatively advanced production techniques and benefit from the poultry innovation system in the region.

The rapid development of poultry is favored by the well-developed organizational structure of the poultry value chain, which brings together all actors. The Regional Government provides the required institutional framework that creates an enabling environment for the development and effective functioning of the poultry sector.

2. The actors in the poultry innovation system, their roles and relationships

Success in boosting poultry production in the Samarkand Region is largely due to the initiatives of key actors in the value chain and innovation system (see Figure 3).

2.1. Actors in the value chain

A special role is played by the “Agalyk-Lohmann-Parranda” agricultural (poultry) enterprise, a joint venture between the German multinational livestock company Lohmann and a privatized former State farm, which in the soviet days had imported the crosses and production technologies developed by the Russian Poultry Research Institute (VNITIP).

Having the status of breeding farm, Agalyk-Lohmann-Parranda imports parents of high reproductive crosses from Germany into the Republic of Uzbekistan and to date produces more than 70% of the incubation eggs and final hybrids supplied to incubators, other large poultry enterprises and professional farms producing eggs and meat for commercial purposes in the Samarkand Region. Poultry enterprises and professional farms can buy both incubation and commercial eggs and chicks. The latter are highly demanded by dehkhan farms for reproduction and backyard production. The poultry enterprises and professional farms sell their products to public organizations that prepare meals, e.g., hospitals and schools, and to other businesses, such as bakeries, confectioners, restaurants, hotels, grocery stores, minimarkets and supermarkets in regional towns and in Tashkent. Dehkhan farms mostly sell their products in local markets or to wholesale buyers at the farm gate.

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10 In recent years, Agalyk-Lohmann-Parranda imported about 100,000 breeding chicks from Germany per year.

11 In 2010, Agalyk-Lohmann-Parranda sold some 5.5 million hatching eggs and 3.4 million one-day chicks.
Figure 3 – The relationship between the actors in the poultry value chain and innovation system
The poultry enterprises and large poultry farms are organised in the Association of Poultry Producers of Samarkand Region, which represents their interests and facilitates cooperation between actors in the poultry value chain and with other actors of the innovation system. The association is involved in:

- implementing the poultry development program agreed with the Regional Government;
- securing timely supply of breeding eggs, one-day chicks and feed to producers;
- attracting investment in the poultry sector infrastructure;
- conducting workshops and demonstrations to enhance the efficiency of the poultry sector;
- monitoring the activities of producers in order to propose and facilitate relevant measures, eliminate obstacles and improve production;
- co-producing, sharing and disseminating new knowledge.

2.2. The Regional Government (Khokimiyat) of Samarkand Region

Another key player in the poultry innovation system is the Regional Government (Khokimiyat) of Samarkand Region and its relevant departments. As indicated, it attaches high policy priority of the development of the poultry sector, because of its important contribution to achieving national food security, as well as to the regional economy and employment. In view of this, the Regional Government not only creates an enabling policy, regulatory and legal environment for the development of the sector, but also provides the necessary physical and institutional infrastructure and ensures access to resources.

Perhaps even more importantly, the Regional Government acts as a broker by bringing the different actors in the value chain and innovation system together and facilitates the joint formulation of the annual “Program for the implementation of measures to develop poultry farming in the Samarkand Region” at regional level. This Program results from intensive bilateral and multilateral communication between the various actors in the poultry innovation system to define consumer demand and assess the producers’ needs and the support they require for better farming and improved livelihoods. The Program defines the roles of various government, public and commercial organizations in implementing the comprehensive measures to ensure the necessary conditions for the development of the poultry industry in order to satisfy the consumer needs of Samarkand Region and supply other regions of the country with poultry products. The Program is approved at the governmental level and involves all aspects of the sector: the premises for breeding birds, cages, feed, preventive measures and protection of birds. Thus, the steering role of the Regional Government is an important factor in the efficient and effective functioning of the poultry innovation system and its sustainability.

Regional Government administration units involved in the innovation system are:

- The Department of Agriculture and Water Resources. This is the executive arm of the Regional Government that is responsible for coordinating the implementation of the activities of all actors involved in the poultry sector;
- The Department for Capital Construction, Transport infrastructure, Public Utilities and Public Works, which is responsible for coordinating construction activities and civil works in the poultry sector;
The Department of Economic Affairs and Social Development, which is responsible for creating an enabling environment for poultry producers, monitoring of socio-economic changes in the poultry sector and providing access to inputs;

District Khokimiyats and their departments have the same responsibilities and duties as the regional departments mentioned above, but at the lower, district, level.

The Regional Department of State Property Committee, in collaboration with other departments of the Khokimiyat of Samarkand Region and the Regional Statistical Office, monitors the housing conditions of incubators, the production capacity and the poultry products. It also assesses needs and collects and analyzes statistical data.

2.3. Supporting public and private service providers

A third group of key actors determining the success of innovation in the poultry sector in Samarkand Region are the public and private organisations that provide supporting services to the actors in the value chain.

Institutional support

The Samarkand regional branch of the Republican Charity Fund "Mahalla", a nation-wide NGO, coordinates the activities of the administrations of rural and mahalla communities\(^\text{12}\), which also form nodal points of the fund “Mahalla”. The latter, supported by the regional and district Khokimiyats and other actors mentioned above, provide various types of institutional assistance to producers, in particular to dehkhan farms. The nodal points are not commercial organizations, but they are key representatives of rural and agricultural households, and responsible for monitoring the timely provision of dehkhan farms engaged in poultry production with eggs, one-day chicks, feed, chicken cages and other inputs. They are implementing the same activities as the District Khokimiyats, but at the lowest, community, level.

The Regional Department of Land Resources and State Cadaster, in collaboration with the Regional Department of State Property Committee and the departments of Khokimiyat of Samarkand Region, allocate plots to specialized poultry enterprises for the cultivation of crops to feed their birds.

R&D and education

The agricultural education system in Samarkand Region has a huge R&D and human resource capacity, which now fully supports the needs of the poultry industry with qualified personnel. There are seven universities and 146 professional colleges, including Samarkand Agricultural Institute and 24 agro-oriented professional colleges in Samarkand Region.

Founded in 1929, Samarkand Agricultural Institute is a major academic institution in Uzbekistan and one of the oldest agricultural institutions in Central Asia. Annually, more than 160 students graduate with a bachelor's degree and 20 with a master's degree in veterinary science. Over 50 students graduate with a bachelor’s and 10 with a master's degree in animal science, including poultry, each year. In animal science, from the third academic year, special student groups are formed for specialization in poultry, which

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\(^{12}\) Mahalla communities, corresponding to a village or neighbourhood, are the lowest level of administration and civil organisation, both in rural and urban areas. Rural communities are confined to rural areas and can comprise more than one Mahalla.
involves training in six specialized departments, including the Department of Animal Husbandry and the Poultry Training Center. The teaching staff of the Faculty of "Veterinary Science, Animal Husbandry and Karakul sheep" comprises 80 PhDs. They are involved in teaching students, research work and practical activities in the institute’s poultry farm and the vivarium. They also operate a veterinary clinic attached to the institute’s scientific laboratory and a veterinary help desk for producers.

Agalyk-Lohmann-Parranda cooperates with the Samarkand Agricultural Institute for human resource and technology development. Almost 75% of the administrative, scientific, technical and support staff and workers of the joint venture are alumni of Samarkand Agricultural Institute. The cooperation contributes to improving productivity, mechanization, nutrition, feed processing, housing and packaging, animal health, and meat and egg processing.

Samarkand Agricultural Institute carries out scientific and research work in poultry farms in the following areas:
- New technologies for growing chicks and young hens;
- New technologies for breeding and fattening of broiler chicken;
- Experiments to improve the housing of the birds;
- Experiments on the development of balanced nutrition and metabolism;
- Development of chemo- and immune prophylaxis and treatment of parasitic diseases of birds (coccidiosis, ascariasis, etc.).

Together with colleagues from the Research Institute of Veterinary Medicine, researchers have been working to improve methods of prevention of infectious diseases of chicken, such as Newcastle disease, infectious bronchitis, Gambero disease, infectious laryngotracheitis, reductions in egg production syndrome, smallpox, etc. Poultry scientists also conduct research to develop effective methods and means for the prevention of associated forms of parasitic and bacterial infections (colibacteriosis, pulloroz-fever, salmonella, etc.).

**Extension and training**

The recommendations and guidelines of Samarkand Agricultural Institute are disseminated among all actors, especially among poultry farms and households, via local communities and the Association of Poultry Producers in Samarkand Region, with support of the Regional *Khokimiyat’s* relevant departments. They conduct in-field training courses and provide information through printed materials, such as technical leaflets, brochures, professional journals, general newspapers and agricultural newspapers. In addition, mobile telephone and internet communication is playing an increasingly dominant role in the generation, transmission, distribution and acceptance of knowledge and information. The four mobile service providers competing in the region offer more and more new services, while the cost of services remains unchanged. Three of these providers also offer mobile internet. Therefore, mobile communication becomes the most affordable, reliable, cheapest and effective tool of communication. Most professional farmers and dehkhan farmers are now using mobile phones and internet and can easily consult experts for advice on specific issues.
"I have more than 200 chicken. Naturally I want to keep abreast of all market news, prices, as well as what types of chicken are more productive, less prone to disease, how to protect birds from disease, how to keep birds. Of course, I have brochures, manuals, advertising sheets, and even journal, but the best way to get information is a mobile phone. With mobile phone I can easily find a veterinarian or zootechnician who would give me any information I need, and, if necessary, they would come to help and explain everything. Or if they have very important information they can easily find me by mobile phone. We all know each other here ....So my best helper in my business is a mobile phone."

Mr. Fazliddin Akhmedov, dehkhan of Kattakurgan District

Prevention and protection
The State Veterinary Office of the Samarkand Region and the Samarkand Regional State Inspectorate for Breeding Livestock, with the assistance of other organizations, support the poultry sector by:
– developing poultry breeding activities;
– expanding the bank of crosses and hybrids;
– importing the parental forms;
– preventing and providing protection against diseases and viruses;
– disseminating knowledge necessary for proper husbandry and health care.

Input suppliers
Feed is produced on farm or purchased from agricultural enterprises processing grain. The latter carry out thorough supervision of the standard requirements for content of feeds. Specialized shops "Mahsus savdo" sell agricultural inputs, including inputs and tools for poultry production, such as vaccines and materials for cages. In these shops, dehkhan farmers and professional farmers also obtain advice on the use of these technologies and other services required.

Bank loans
Commercial banks, such as the Microcreditbank, Khalkbank, Kishlokkurilishbank, Ipotekabank, Savdogarbank, Agrobank, National Bank, and Hamkorbank, provide loans to producers for the procurement of one-day chicks, hatching eggs and feed, the purchase or construction of cages, and for financing the construction of specialized shops "Mahsus savdo" in each mahalla.

3. Lessons learned and good practices
The specific interest of this Case Study of the poultry innovation system in Samarkand Region is that the system examined effectively combines a strong steering and facilitating role of the Regional Government, with private initiative of actors in a value chain operating in a partly liberalized market economy. A further specific interest of this case is the mutually beneficial relationship between professional farms and dehkhan farms on the one hand and large private poultry enterprises on the other, with a key role for the Agalyk-Lohmann-Parranda breeding enterprise, which imports technology from abroad. This configuration also stimulates the development of an impressive and dense local knowledge infrastructure and attracts a wide range of public and private service providers, which supports the continuous improvement of the poultry sector.
The impression to date is that both foreign suppliers of technology and regional R&D actors are guided by the requirements of the technology rather than by the requirements of the socio-economic and other specific conditions under which the different types of producers are operating and under which the technology has to be applied. The focus is on achieving technical optima. Therefore technology development is biased towards the (technically more favorable) conditions of large enterprises. This bias seems to be compensated by a range of measures to adapt the socio-economic and other conditions of professional farms and dehkhan farms in such a way that they can obtain technically satisfactory results. There does not seem to be a strong orientation toward adapting technology to fit the specific socio-economic and other conditions of professional farms and dehkhan farmers as is attempted in other parts of the world. Nonetheless, this does not withhold smallholders from benefitting from this development. Further studies are needed to provide more insight into this specificity of the case examined and draw lessons from this that may well also be useful for other parts of the world.

The combination of strong public steering and private sector initiative, as well as the combined participation of smallholders and large industrial poultry enterprises, is perhaps specific for countries with formerly collectivized economies that obtained their independence from the Soviet Union after 1990. While this may confine the practical applicability of good practices based on this Case Study to countries in Central Asia and the Southern Caucasus, and perhaps in Eastern Europe, the Case Study is providing interesting material for a comparative analysis with Case Studies from Central America and West Africa that were, like this Case Study, developed with support of the project “Good Practices for Integration of Agricultural Research for Development into the Wider Development Agenda – Workshops for Decision Makers”. But in addition, the practical applicability of some of the good practices illustrated in this Case Study may well be highly relevant for more established market economies as well, especially those regarding the advantages of a strong role of public agencies as broker and facilitator. There is a growing consensus in the global literature on innovation that even where strong market incentives for multi-actor collaboration in innovation exist, such collaboration often does not happen spontaneously, but requires a strong broker, a role which only the public sector can play.

4. Conclusion

Undoubtedly, the innovation system that boosts poultry production in the Samarkand Region is an example of successful implementation of initiatives. Its success is based on providing an enabling environment for entrepreneurship, the human factor of producers and poultry farmers, producers’ past experiences, and their desire to modernize production, aimed at the needs of the market.
In conclusion, it should be noted that key actors of the innovation system, such as the Joint Venture Agalyk-Lohmann-Parranda not only set the pace of modernization and technical upgrading of production and thus ensure the competitiveness among other producers, but also create a base for further integration of the innovation system components: agricultural education, agricultural research and extension, as well as the introduction and expansion of modern technologies, including a wide range of ICT tools.
Annex 5.

AIS Poster, Armenia

Development of Aquaculture in Armenia
G. Sargsyan & A. Petrosyan

1. Observed Socio-Economic outcomes
In Armenia, the introduction of fish farming Lake Sevan increases the demand for pond fish. Fish farming in Armenia has great potential for development. The water quality and quantity form the main competitive advantages of Armenia in aquaculture development. In Ararat Valley, the effluent underground water has a temperature of 14 degrees (optimal for breeding trout). The land used is suitable. There are 234 fish farms in Armenia covering 26.77 km² of water. These include 1-2 fish farms. Fish farms average 1.5 km². Fish farms are authorized for the production of fish. The majority of fish farms are located on saline land suitable for agriculture. Farmers have acquired the land at low cost, invested capital, and produced fish. It is important that Armenia has already operated in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Efforts are being made to enter the European markets. Armenian exports include fresh or frozen fish and fish products to markets in Russia, Ukraine, and Georgia.

2. Production of fish
Over the past 20 years, fish farms in Armenia about 15 species of fish were bred. These include rainbow trout, sturgeon, carp, whitefish, perch, bleak, channel catfish, hybrid carp, and tilapia, etc. Some farms begin to cultivate African catfish and Japanese Koi in local conditions. However, many small-scale monitor technical production of sturgeon and trout. Sturgeon is commercially cultivated in combination with the cultivation of trout. As sturgeon, trout can be planted in cold water. Following by a heated-trout, and the reverse is water. In general, it allows more efficient energy use. Armenia does not have to import fry of these species from other countries. They are locally available. The annual production is about 4-4.5 thousand tons of fish of which 600-700 tons of sturgeon, and about 3500 tons of trout.

3. Technological innovation
In 2015, the Foundation for Economic Development of land areas in Armenia (FRED) invested in the "Akshabhtarsmatirka" company's business. 82.2% of these funds were used to purchase basic equipment: ponds, oxygen generators, aerators, and laboratory equipment. In particular, in addition to concrete ponds, plastic ponds have been introduced, which allow double output at the same level of investment. Plastic ponds are more efficient than concrete, both in terms of construction costs and exploitation.

4. Participants and stakeholders of the innovation system
An effective innovation system of aquaculture requires a developed, interrelated organizational structure and operational mechanisms that combine all the necessary links in the production area:
- Association of fish farmers in Armenia
- Fish farms
- Regional Directorate of Agriculture
- State Inspection
- State Committee of Land Resources and Inventory
- Fund for Economic Development of land areas in Armenia (FRED)
- Commercial banks
- Department of Livestock of the Ministry of Agriculture
- Committee of bio-resource conservation of the Ministry of Environment
- Armenian State Agrarian University
- Institute of Biology at the Armenian Academy of Sciences
- Fish processing companies
- Farm residents
- National and regional centers of statistical data
- Supermarket networks

4.1. National and regional organizations: The Association of fish farmers in Armenia performs a coordinating role and is a driver of the innovation system that stimulates the development of fish production. In cooperation with other actors of the innovation system, it is involved in:
- Implementation of the aquaculture development program
- Monitoring of fish stock
- Attracting investment in the infrastructure for fish production
- Conducting demonstration workshops on the effectiveness of innovative technologies in fishery

4.2. The Livestock Department of the Ministry of Agriculture, the Committee of bio-resource conservation at the Ministry of Environment, and national and regional centers of statistics are responsible for:
- Monitoring the state of fish farms
- Monitoring the production capacity of the fish farms and processed products
- Collecting and analyzing statistical data

4.3. Commercial banks allocate loans to fish farmers. To introduce new technologies to increase production capacity, produce high-quality animal feed, and market and sell processed fish products.

5. Conclusion
Innovations in fish farming in Armenia, in particular introduced in the Ararat region, is an example of successful use of advanced scientific technologies and outputs aimed at the needs of the market, which is supported by the state and based on an enabling environment for the development of aquaculture in the country.
Annex 6.

AIS Poster, Georgia

Private Breeding and Seed Supply in Georgia

G. Alecsidze (National Expert of CACAARI for Georgia), K. Lastkhi (Director of AgroCompany "Lomtagora"), G.Chkhatiaishvili (Research Institute of Plant Industry), O. Tedaradze (Ministry of Agriculture)
Large-Scale Production of Veterinary Test-kits for Diagnosing Serious Diseases in Animals in Kazakhstan

B. Alimzhanova and A. Shamshidin

The Challenge
Bone foot-and-mouth disease, tuberculosis and leishmaniasis remain a problem in Kazakhstan, as they do in the rest of the world. Foot-and-mouth disease (FMD) were recorded in Kazakhstan in 1996, 1998, 2001 and 2007. There is a constant threat of introduction of FMD virus from neighbouring countries. According to official veterinary statistics, the proportion of cattle infected by the leucovirus reaches 10-30% in Kazakhstan. Most significant damage is inflicted upon the pedigree gene pool of highly productive cattle. The main challenge for veterinarians in Kazakhstan is timely diagnosis of this disease by means of virological methods. However, imperfect diagnostic products cause nonspecific reactions to tuberculin even in healthy animals. Mass slaughter of healthy animals tests to great economic losses. Thus, production of highly accurate diagnostic tool-kits is vital to solving this problem in Kazakhstan.

Aim of the innovation project
The project’s aim is to launch large-scale production of the following 13 veterinary diagnostic products:

- Typ-specific antigen to the FMD virus of types A, O, Asia-1 for serological reactions
- Typ-specific serum to the FMD virus of types A, O, Asia-1 for serological reactions
- Acid-thermal diagnostic kit for bovine leucovirus
- Tuberculin for movement and birds
- PCR test system for brucellosis detection
- PCR test system for detection of bovine leucovirus
- ELISA test system for diagnosing bovine tuberculosis
- PCR test system for detection of anthrax bacteria
- PCR test system for diagnosis and differentiation of tuberculosis

The project has been initiated by the DiaVAK company in 2009. Production of diagnostic tool-kits was launched in 2010. Kazakhstan diagnostic tool-kits produced within the project have the following competitive advantages:
1. Improved accuracy of test compared to foreign counterparts;
2. Shorter period before technology can be put into mass production;
3. Lower costs of production and higher quality compared to foreign counterparts.

Implementation of the project at the farm level
DiaVAK

Republicas Veterinary Laboratory
210 branches across Kazakhstan

Other state organisations

More than 750 small firms and pedigree livestock farms

Annual diagnostics of animals is conducted in 100% of small firms in Kazakhstan.

Key factors of success
- Governmental support: DiaVAK company has been introduced by the Ministry of Agriculture of Kazakhstan to the official State Register of suppliers of veterinary diagnostic products;
- Successful R&D results that have been approved and ready for industrial production;
- Modern R&D facilities and manufacturing capabilities and highly skilled personnel of Kazakhstani Scientific Research Veterinary Institute

Lesions and priorities for the future
During the course of the project it became apparent that NADs are necessary with the following aims:
1. To ensure rapid establishment and maintenance of medium-term monocopy on the production of existing technologies (antigen and sera for FMD virus) by improving production quality and reducing production costs;
2. To develop and promote new technologies such as production of tuberculins, of PCR and ELISA tests; to develop good marketing strategy of introducing them to foreign markets;
3. To develop production technologies of vaccines for animals and birds, in coordination with Kazakhstan scientists in CACAARI laboratories.

Project participants
DiaVAK-ABI company

Innovator and Executor
Specialises in the production of veterinary diagnostic products. It has been on the market for 7 years. The annual turnover was 140 million tenge in 2009.

Role within the project
- Organisation and implementation of all project activities within the agreed framework;
- Investment of own debt capital in quantity necessary to achieve the objectives of the project.

Centre for the transfer and commercialisation of agricultural technologies

Strategic Partner and Investor

Specialises in the transfer and commercialisation of agrotechnologies and invests in innovative businesses and industries.

Role within the project
- Investment in the authorised share capital of DiaVAK of 50 million tenge to launch the production of diagnostic test-kits.

Kazakh Scientific Research Veterinary Institute

(subsidiary of "KazAgroInnovation") JSC

Partner

Specialises in research in the field of veterinary medicine.

Role within the project
- Providing the Executor of the project with manufacturing facilities and scientific personnel;
- Provision of scientific and technical expertise.
Annex 8.

AIS Poster, Turkmenistan

Central Asia and the Caucasus Association of Agricultural Research Institutions

Innovative Irrigation Technology in Turkmenistan

K. Saparmuradov

Climate change stimulates innovation

Agricultural practices in Central Asia make inefficient use of resources that are increasingly scarce due to climate change. This causes critical environmental problems. A range of interrelated measures is needed to address these. They include the development, introduction and adaptation to local soil conditions of resource-saving irrigation and drainage practices for the production of cotton and winter wheat in rotation. These are main crops in Turkmenistan grown on hundreds of thousands of hectares.

Organisation of production and government support

Cotton and wheat are grown by dehkan associations and small farmers (2-30 ha) who also keep cattle, horses, camels and chickens. They are dependent on these crops for their livelihood. Farms grow cotton and grains on government order. They are exempted from taxes. Various public organisations support the production of these crops. The Ministry of Water Resources of Turkmenistan provides irrigation water for free. Land preparation (by a specialised association, Turkmenbeyvoz) and fertilisers (supplied by a State Company, Turkmenbeyvoz) are subsidised for 50%. Seeds sown free of charge by a specialised association (Turkmenpalamon) for cereals products and a State Company (Turkmenpapd) for cotton, which are also responsible for the entire production process of these crops from sowing to harvesting. The State Commercial Bank (Osheron) provides loans to farmers at 1% interest. All these activities are co-ordinated by the Ministry of Agriculture.

Resource-saving irrigation technology

The author was involved in the development of water, manure and energy-saving technologies for cotton and wheat. These include sowing and concentrating water and manure at the bottom of the furrows between ridges (see figure: to the right). After production of a wheat crop, the position of furrows and ridges is swapped for the cotton crop of the following year. As cotton seeds are thus sown in soil that was not fertilised the year before, irrigation for leaching is no longer needed. This saves an average of 2,000 m³/ha and 15-20 days. Annually, irrigation is used to teach 250,000 ha of cotton in Turkmenistan. The potential water saving is therefore 1,200 million m³. In addition, as precipitation gathers at the bottom of the furrows, cotton can be sown without irrigation for moisture loading. This practice is used on 100,000 ha in Turkmenistan and requires 1,200-1,500 m³/ha. The potential further saving is therefore 120 million m³ and an additional 8-10 days. The technology also saves manure, which is sprayed mechanically and accumulates at the bottom of the furrows, and chemical fertiliser, which is applied exactly on the area where the cotton root system develops. Finally, asillage is carried out on part of the land only (under the ridges of the previous season), energy is saved and labour productivity of tractor drivers is increased. After cotton, the position of furrows and ridges is swapped again for the following wheat crop.

With support of the Academy of Sciences of Turkmenistan and the Ministry of Agriculture, the author also developed new water use counters and adjustable irrigation pipes and siphons. These have been patented and are now introduced to cotton growing farms in two provinces.

The innovation system

Agricultural innovation is strongly supported by government and policy measures to support farmers are strictly enforced. The different organisations involved work closely together and regularly consult with scientists and inventors. They share a common interest in introducing the new technology, saving water and fertiliser and obtaining high yields.

The actors in the innovation system are:

- Ministry of Agriculture of Turkmenistan
- Ministry of Water Resources of Turkmenistan
- Association Turkmenbeyvoz of joint stock companies supporting and servicing agricultural production
- Association Turkmenmogolzoi (cotton seed products) association and the Turkmenpapd (cotton) state company. The technology is well-appreciated by farmers and dehkan associations, regional and district governments and its use increases yearly. Data provided by the Turkmenmogolzoi association show the expansion of the acreage on which winter wheat is sown in the space between former cotton rows (see chart below).

Diffusion of the technology

The technology of sowing in furrows between ridges is diffused through mass media and training of farmers and dehkan associations by the Ministry of Agriculture, the Turkmenmogolzoi (cotton seed products) association and the Turkmenpapd (cotton) state company. The technology is well-appreciated by farmers and dehkan associations, regional and district governments and its use increases yearly. Data provided by the Turkmenpalamon association show the expansion of the acreage on which winter wheat is sown in the space between former cotton rows (see chart below).

Adjustable irrigation siphon

Area (ha) of winter wheat sown in space of cotton rows

<table>
<thead>
<tr>
<th>Year</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>50,000</td>
</tr>
<tr>
<td>2008</td>
<td>100,000</td>
</tr>
<tr>
<td>2009</td>
<td>150,000</td>
</tr>
</tbody>
</table>

250,000
200,000
150,000
100,000
50,000
0
Annex 9.

The proposed follow-up Program\textsuperscript{13}

**Strengthening the capacity of stakeholders of National Agricultural Innovation Systems**

to be implemented in
Central Asia and the Caucasus countries \textsuperscript{14}
jointly organized with CACAARI, EIARD/ICRA\textsuperscript{15}

The situation

Agriculture in the CAC region faces problems, some of which are a legacy of past decades, while others are caused by the unstable situation of the global economy and of the environment. Concerns about these problems are compounded by countries’ understanding that increasing food prices and over-exploitation of natural resources are primarily a threat to smallholders and vulnerable population groups. It should be mentioned that population growth that will lead to increased food consumption and use of even more natural resources requires a comprehensive approach to solve the problems.

The development of an efficient agricultural research and extension system to address the needs of farmers and other actors of the agricultural sector is considered as an important factor for the reorientation of CAC region smallholder farmers towards markets, their income diversification, contribution to environmental protection and adaptation to climate change.

The development of innovation systems in the region is considered as a necessary condition for protection from crisis situations and enhancing agricultural productivity. Promoting innovative activities of the agricultural sector will enhance not only the production chain, but also significantly improve the investment climate in agriculture.

The Brainstorm Meeting held in Tashkent, Uzbekistan, on 29/11-03/12, 2011 to discuss the issues of “Transforming and Strengthening of Agricultural Research and Innovation Systems in CAC region”\textsuperscript{16}, showed that this transformation and strengthening process that aims at improving agricultural productivity as well as population welfare, should

\textsuperscript{13} This proposal is view of CACAARI technical consultant, and does not reflect the position of CACAARI or ICRA. The content is for discussion and can be changed and corrected, added or cut, by recommendations of proposed parts.

\textsuperscript{14} Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan

\textsuperscript{15} It would proposed that more institutions will be involved in the learning program, GFAR, EFARD, AGRINATURA, as well as with support of CAC State organizations, e.g. Ministries of Agriculture, Academies of Science

\textsuperscript{16} Organized jointly by CACAARI and ICRA, with support of GFAR and ICARDA, and participation of FAO/Turkey Partnership Program, ASTI initiative of IFPRI and other national, regional and international institutions and representatives.
address the issues related with intellectual and human capacity and with development of strong communication links between academic institutions, regional (provincial) scientific and research organizations, experimental stations, testing centers, agricultural enterprises, farmers, smallholders and other users of scientific information. Establishing systemic connections between research institutions and producers will provide an opportunity to effectively implement science findings and disseminate best practices.

**Appropriate concept of Innovation in CAC region**

Would it be appropriate to speak of “Agricultural Innovation Systems (AIS) in CAC region”? Theoretically, according to its evolution (1980s) National Agricultural Research System (NARS), transformed into (1990s) Agricultural Knowledge and Information System (AKIS), which in turn (recently) transformed into AIS17. But, while the region is defining the features of the Systems: role, outcome, organizing principle, mechanisms of innovation, role of policy, nature of capacity strengthening, the CAC region still experiences the early National Agricultural Research Systems (1980s), partially due to Soviet legacy of agricultural management, and current research system operation mechanism based on the Soviet Research system.

The main obstacles to innovation system development can be considered as:

1. Limited group of actors involved in the innovation system. Not only Research organizations, and producers, extension and education, but many others should be involved, such as policy makers, credit unions, input suppliers, consumers etc.
2. Weak enabling policy and institutional environment necessary for developing innovation. In CAC, there is a persisting gap between technology inventions and technology adoption on a broad scale, an issue that was recognized in developing countries in the 1980s. To enable innovations, policies and institutions must change.
3. Lack of motivation and stimulation in new uses of knowledge for socio-economic change and development. The time when agricultural knowledge was created by science alone has gone. Creating wider access to the agricultural information and knowledge is an urgent issue in CAC region.
4. Low and reluctant interaction and innovation among all actors. The linear model (basic science – engineering – manufacturing – marketing – sales) is not working effectively anymore. That is why “interactive learning” among all actors should substitute the classical technology transfer mechanism.
5. Poorly organized interlinked communication channels by the various actors in agricultural development. Improving this could include creating an agricultural information center with question-and-answer service using the internet and (mobile) telephones, as well as regular television and radio slots for question-and-answer service for farmers and other rural communities.

Thus, to strengthen the capacity of AIS, the interventions should be focused on:

1. Strengthening the interaction between all actors of the AIS,

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17 According to World bank, 2006, Enhancing Agricultural Innovation: How to go beyond the Strengthening of Research System
2. Support institutional changes to create the base for interaction
3. Creating of enabling environment for implementing above mentioned measures.

Some good practices of Innovation system in CAC region show that the main reason of success in practices is strong state support and state regulating mechanism. The enabling environment plays the biggest role in developing and strengthening the AIS. Directly or indirectly, strong enabling support is promoting the technology inventions to the market in CAC region, which compensates the lack of interaction among the other actors.

The concept of strengthening the Agricultural Innovation System (beyond NARS or AKIS) should be part of the wider development agenda. Today, the knowledge should be created not by science / research itself, but by interaction of all actors, this will ensure the promotion of demand oriented innovative technologies.

Opportunities for innovative development

The CAC region has a lot of opportunities for developing and implementing innovative technologies, due to the importance of its agricultural sector in the economy. We have large agricultural education systems, which incorporate science and skilled workforces for agriculture. There is a tendency that Agricultural Universities will be transformed into or will incorporate big agricultural research centers. The CAC countries have a legacy of big agricultural research systems. And the last, but not least opportunity for integration of innovation in agriculture is the big share of the agricultural population. Thus, the region is open for strengthening the AIS, but it is expected that this demand will be supplied by strengthening of interaction between all actors, where the state should play the biggest role as a trigger of innovation system. To promote the concept of AIS in the wider development agenda in the CAC region, the region needs exposure to new ideas and support from international organizations, research centers and donors.

Another argument for integration of the modern concept of innovation is underfunding of AR4D in the CAC region. Currently, the Regional strategy of Transforming and Strengthening of Agricultural Research and Innovation system highlights the lack of investment in AR4D to contribute to the agricultural development. But it would be wrong if we consider the under-sourcing of ARD as the only factor that hinders agricultural productivity. In resource-constrained economies, such as in CAC, increased investments in ARD in “science push” will not ensure the expected development. That is why the innovation system concept should create a framework for integrating innovation capacities in the rapidly changing market, technological, social and institutional environments of the agriculture sector.

In order to support the required transformation and strengthening of AIS in the CAC region, an innovative program of exposure, learning and initiating change is proposed.

Proposed agenda for the program

1. Training of trainers and demonstration of a well-established Agricultural Innovation System (AIS) in one of the developed countries. One to two trainers
from each country and one to two policy makers (from related units or
departments of the Ministry of Agriculture) from each country should be trained
and informed how a well-established AIS operates. Later, policy makers who
participated in this training and received a comprehension of what an AIS is and of
how an AIS operates and contributes to (smallholder) agricultural development
and improvement of livelihoods of the rural / agricultural population, will assist
and facilitate the program to strengthen AIS development and AIS stakeholders
capacity in the country. The one-week training could combine desk and practical
learning. If this training will be organized at agricultural enterprises, there would
possibility for business cooperation between host country and CAC countries. A
CAC regional program coordinator would also participate in this training for
further coordination of follow-up activity in CAC region. He or she should be good
both in English and Russian, as common language in the region. The Program
coordinator, together with an international consultant (ICRA), should also be
responsible for M&E of the entire program implementation and reporting.

2. Trained Trainers returned from study tour will prepare a short proposal for a
national learning program and budget not exceeding what was planned initially at
the moment of designing and contracting of this regional program. National
trainers, with involvement of the policy makers who attended the training of
trainers, should identify three innovation cases at national level to be studied by
trained trainers:

i) Success story, that can be an example that demonstrates all features of
modern AIS (the features of AIS we learnt at “training of trainer”). It would
be necessary to present it in a national workshop (see Point 3);

ii) Example of “traditional” system for generating research and knowledge,
that cannot deal with the rapidly changing context for agriculture, with
linear model.

iii) New project or proposal of “knowledge that can be transformed into value
by social actors” that should be conceptualized or transformed into an
innovation system. This project should be discussed at a national workshop
by all stakeholders: farmers, researchers, entrepreneurs, policymakers,
input-suppliers, etc.

3. National trainers should also identify the list of stakeholder groups and invite two-
three representatives from each stakeholder group to the national workshop. The
national workshop on “Strengthening capacity of stakeholders of National AIS”
should be led by an international consultant, the CAC program coordinator and
the national trainer (above mentioned). The national workshop should include a
learning section and group discussion of the three cases mentioned in Point 2. The
agenda and outcomes of the workshop should be disclosed in Mass media. The
one-week workshop’s objectives are:

i) Increased capacity of AIS stakeholders in comprehension of innovation
system in contemporary agriculture;
ii) Presentation, further publication and dissemination of good practices of AIS in under-resourced economies

iii) Comprehension how “social actors in innovation processes learn together and transform knowledge to create value”

iv) Identifying strengths and weaknesses of the national agricultural research and innovation system

v) Preparation of a national report on “Strengthening capacity of stakeholders of National AIS” that should be synthesized and presented in the Regional workshop (see Point 4). This should include further specification of learning needs and a plan to develop the required new insights, competencies and mind-sets (including the organizations that will be able and willing to implement this plan).

4. A Regional workshop should be organized to share knowledge and lessons learnt and to develop a regional capacity strengthening strategy and plan (as part of the overall Regional Strategy of Transforming Agricultural Research and Innovation system). The case studies on AIS should be presented and discussed. It should also demonstrate the capacity built among stakeholders. And recommendations on how to effectively influence the development of contemporary agriculture with particular emphasis on smallholder agriculture in an environment where AR4D is under-financed. This finding should later be published and disseminated among stakeholders in the CAC region.