

Priorities in Agricultural Research for Development in Central Asia and the Caucasus: Summary Report

Preparation of a Regional Review

As a part of the GCARD 2010 process, a Regional Review on Agricultural Research for Development (ARD) in Central Asia and the Caucasus was prepared by the Lead Consultant as per the guidelines provided by GFAR. The English and Russian versions of the review were shared with different types of stakeholders in agricultural research through the CACAARI and GFAR websites, and also through emails. The review highlighted the characteristics of the CAC region, identified regional development goals and their linkage to agricultural development, discussed the current and potential contributions of ARD to overall development goals, and identified six major challenges for ARD in the region. The review also identified 23 key researchable issues under the six major challenges, which included the following:

1. Food security

Key Issue 1: Provide effective financing of agriculture and farms to support newly-emerged small-scale farmers and *dehkon* (rural household farming/kitchen farming/mini-farming) in the region

Key Issue 2: Enhance the sustainable productivity of agriculture in the irrigated or rainfed/less-favored or “lagging” areas while protecting the natural resource-base

Key Issue 3: Need to explore the full potential of livestock sector in the region

Key Issue 4: Need to pay a much greater and special attention to horticulture sub-sector

Key Issue 5: Need to emphasize on research on fisheries and aquatic production systems

Key Issue 6: Need to pay attention to trans-boundary animal and plant diseases and pest

Key Issue 7: Need to develop and manufacture machinery for use by small-scale farmers

2. Improving the declining living standards and improving livelihoods

Key Issue 8: Study and analyze the declining living standards and livelihoods in rural areas and develop opportunities for household income generation

Key Issue 9: Improving the livelihoods of small-scale subsistence farmers in the mountains of CAC region

Key Issue 10: Organize and promoting the role of rural women in agriculture, and agricultural research and development

3. Protecting the environment

Key Issue 11: Enhancing efforts on protecting the precious land and water resources

Key Issue 12: Protect the much useful forests from degradation and embark on afforestation and agro-forestry programs

Key Issue 13: Enhance efforts on protecting precious vast natural biodiversity present in the region

4. Achieving structural reforms

Key Issue 14: Developing legal frameworks for land tenure, access and property rights

Key Issue 15: Improve the structures for irrigation to make irrigated agriculture to improve efficiency of the irrigated agriculture

5. Meeting the special challenges (both existing and future)

Key Issue 16: Aligning agriculture research and development to meet the challenges of global warming, i.e., adaptation to and mitigation of climate change

Key Issue 17: Need to address the issues that relate to Aral Sea problem considering its great importance and serious implications in environment and agriculture

Key Issue 18: Need to address the issue of desertification

6. Strengthening national agricultural research systems

Key Issue 19: Need for greater investments in agricultural research and restructuring of the research system to coordinate the national agricultural research system and to meet the national agricultural development goals

Key Issue 20: Introduce changes in agricultural education system in line with the goals of agricultural research and development

Key Issue 21: Creating an effective extension system for the country to create linkages with farmers, researchers and civil society organizations, and to facilitate technology transfer

Key Issue 22: Need for capacity development in research infrastructure and enhancing research capabilities of the researchers and technicians

Key Issue 23: Need to strengthen agricultural research and development linkages at sub-regional, regional, inter-regional and global levels.

E-Consultations

The e-consultation process in the CAC region was conducted from 3 – 23 September with active support from CACAARI and GFAR Secretariat. A total of about 200 messages from 120 participants were exchanged during the e-consultation process.

Key issues identified for ARD

The CAC e-consultation participants endorsed the six challenges and 23 key issues of agricultural research for development identified in the Regional Review Report, which was shared with the participants. The key issues highlighted by the participants to improve productivity and production and incomes and livelihoods of small-scale farmers during the e-consultation process are summarized below:

Food and nutritional security

- Improved technology for increased productivity and production of field (including cereals, pulses and potato) and horticultural crops (fruits and vegetable for which tremendous scope exists) in a sustainable manner in both irrigated and rainfed situations without affecting natural resource balance and environment
- Increased investment in agriculture and agricultural research, extension, and education and their restructuring
- Access to inputs including small farm machinery, fertilizers, credits, etc.

Emphasis on livestock sub-sector

- Livestock (both small and large ruminants) management in irrigated, rainfed areas and mountainous areas, where it supports livelihoods of large populations of subsistence farmers/herders in the region

- Forage and feed availability
- Rangeland regeneration and conservation
- Improved breed, insemination, livestock health, and transboundary diseases
- Processing and marketing of milk and milk products

Emphasis on and support to small farmers including women

- Education, training and learning opportunities
- Access to improved technology/innovations and inputs (improved seed, small farm machinery) through strengthened extension system
- Favorable policies on land tenure, access and property rights, micro credit, market accessibility, income diversification and taxation laws
- Socio-economic studies to understand their problems and constraints

Environmental issues

- Land and water degradation and management
- Soil fertility, Soil salinity, soil drainage
- Irrigation water and use
- Conservation of agriculture and crop diversification
- Climate change – adaptation and mitigation
- Carbon sequestration

Investment & support to agriculture and agricultural research

- Greater investment in agriculture and agricultural research by the governments and the private sector
- Support to repair the vast irrigation systems present
- Restructuring of research, extension and education systems
- Collaboration and linkages at institutional, national, sub-regional and regional levels
- Use of ICT in science, education and extension systems

Strengthening seed production systems

- Effective seed production systems for field (including potato) and horticultural crops and for forest trees at national levels
- Private seed enterprises

Protecting biodiversity

- Study, conservation and use of vast biodiversity in plants and animals of the region
- Gene banks for medium and long-term storage of PGR

Desertification problem

- Methods to control desertification
- Afforestation
- Agro-forestry

Paying attention to fisheries

- Support to fisheries, an important source of food in the region and with tremendous potential for exports, to improve the incomes and livelihoods of fisher folks in the region
- Research on fresh water and pond fishing and market research

Summarizing the key issues with respect to improving the livelihoods of smallholder farmers

Different key issues highlighted in the Regional Review and by the participants in the e-consultation could be grouped into (A) Issues that relate to commodity areas, and (B) Issues that are cross-cutting in nature. These could be summarized as follows:

A. Issues relating to Commodity Areas

The issues highlighted in this category are important objects for development and are considered important by participants for improving productivity and production of different commodity areas and crops starting from the input through output level, at output/post-harvest level, for participation in markets, at consumer level, and at institutional level. The commodity areas considered important for different categories of farmers [households of *dehkons* (kitchen garden/mini farming), households of small farmers (<5 ha), households of small to medium farmers (5-50 ha) and large farmers, pastoralists, sustenance smallholders in mountains, forest dwellers and fisher folks] in the region include field crops (cereals, pulses and potato), vegetables, fruits, herbs, nut crops, floriculture, livestock (small and large ruminants, poultry, rabbits), inshore fisheries and medicinal plants and non-timber forest products. Different issues under objects for development are categorized as follows:

a. Researchable issues at input level

These include the following:

Seed/breeding management:

- Crop: Access to quality seeds of improved varieties
- Animal: Insemination service, controlled breeding, embryo transfer

Land management:

- Crop: Land tenure
- Animal: Ownership, tagging

Soil management:

- Crop: Composting, fertilizer, salinity, micronutrients, etc.; Conservation agriculture; Crops diversification
- Range/Pasture: Sustainability, water harvesting, degradation; Grazing management

Health management:

- Plant/Farm: Pest and disease spread, monitoring, surveillance
- Animal/Herd: Disease surveillance, monitoring, vaccination, preventive care

Water management:

- Farm/community:
Structure & systems of irrigation & drainage, equipment, monitoring
Equity/access, water-users associations

Knowledge management:

- Individual/household/community:
Access to new knowledge, ability to share knowledge
Knowledge intermediaries, extension & advisory services

Labour management:

- Women/individual/household/community:
Role of women
Farm machinery, equipment

b. Researchable issues throughput level

These include the following:

Productivity increase at whole farm/production system level:

- Whole farm studies, modeling, simulation
- Availability of improved technology
- Seed improvement
- Integrated pest management
- Organic agriculture

c. Researchable issues at output/post-harvest level

These include the following:

- Post-harvest product management
- Processing
- Packaging
- Storage
- Transport

d. Researchable issues for participation in markets

These include the following:

- Institutional issues
- Market information
- Food safety, labeling
- Retail packaging
- Export market research

e. Researchable issues at consumer level

These include the following:

- Super market needs
- Consumer preferences
- Acceptability

f. Researchable issues at the institutional level

These include the following:

- Land tenure
- Livelihoods and poverty analysis
- Input market management and participation
- Water access
- Output market management and participation
- Financial support loans
- Involvement of private sector in agriculture
- Taxation

B. Cross-cutting issues

A number of cross-cutting were highlighted in the Regional Review and by the e-consultation participants that are very important in achieving the desired progress. These include the following;

Investment in agriculture and agricultural research
Change in agricultural research systems (including need for young researchers)
Change agricultural extension systems
Changes in agricultural education systems
Capacity building in research infrastructure and capabilities
Developing effective linkages (networks)
Protecting land (including rangelands) and water degradation
Protecting agro-biodiversity
Climate change
Desertification
Protecting forest degradation and afforestation
Aral Sea problem

Face-to-Face Consultation

A Face-to-Face consultation meeting was organized in Tashkent, 16-17 October 2009, was attended by about 90 participants that represented research and educational institutions, farmers and farmer organizations, NGOs, policy makers, and private organizations.

Group discussions

Following presentations on CGIAR Strategy Research Framework (by Dr. Mohammad Roozitalab representing the CGIAR), GCARD Process (by Dr. Ajit Maru of GFAR) and the Regional Review and Results of e-Consultation (by Dr. Surendra Beniwal, Lead Consultant for CACAARI for the CAC region), group work under two Sessions were initiated. A guide to the Facilitators was provided to guide the Group work which had seven groups in each session. The participants actively participated in the discussions around these topics in both groups which were exciting. The group discussions and Plenary Sessions where the group discussion results were presented with follow up discussions took more than 75 per cent of the time of Workshop. The discussions on the various topics continued during tea/coffee breaks, lunches, bus trips to the venue and during reception and dinner.

In each group session there were seven groups that discussed the following:

Session I Groups

- Researchable Issues to support Dehkon Farmers
- Researchable Issues to support Small Farmers
- Researchable Issues to support Small to Medium Farmers
- Researchable issues to support Large Farmers to produce food and Agro-forestry
- Researchable Issues to support Mountain Farmers
- Researchable Issues to support Pastoralists and Livestock production
- Researchable Issues to support Forest dwellers

For this group a matrix of issues as identified during the regional review phase and e-consultations for various categories of farmers as the subject of development and various objects around commodities that farmers produced were listed for discussion about their importance, the priorities for research to be

undertaken based on their importance and the time by which the research should make an impact were sought to be identified.

The results on priority commodity areas/commodities and researchable areas were identified for different groups of farmers. For crop producers, mixed crop/livestock production was recognized as a very common practice. Important crops considered were cereals (wheat, barley, maize), potato, vegetables and fruit crops, whereas cattle and sheep were important livestock. Cotton was considered as important for small-medium-large farmers. Forage crops were considered as important as animal feed.

Among priority researchable areas for mixed crop/livestock production system were access to inputs (seeds/saplings/breeds, fertilizer, credit, farm machinery, etc.), pest management, productivity increases at whole farm/ production system level, water/soil management, post-harvest processing, access to markets, access to knowledge and favourable policies for agricultural development.

For pastoralists, important researchable issues considered were livelihoods analysis improved technology for animal production, feed and forage supply, breed improvement and insemination, water access, preventive health care, processing and marketing of milk/meat products, organization of animal producers into cooperatives. Also considered important were use, renewal and conservation of rangelands including biodiversity conservation, innovation technologies and effective extension linkages.

For smallholder farmers in mountains, mixed crop/livestock farming was considered important. Access to inputs (seed/saplings/breeds, farm machinery, soft credit), land tenure and erosion, soil conservation, conservation agriculture on slopy lands, post-harvest processing, access to markets, capacity building and extension services.

For forest dwellers, soft and hard timber and non-timber products, rangelands and livestock, forest ecosystem and tourism and favourable forest development policies were considered important commodities. Among researchable issues, reforestation, integrated forest/livestock/fisheries production systems, access to improved seeds/saplings, harvesting, post-harvesting and marketing of non-timber products, indigenous knowledge, land degradation, capacity building and education through an improved extension system were considered important.

Session II Groups

- Investments in agriculture and agricultural research and change in agricultural research and innovation systems including capacity development
- Change in agricultural education, extension and advisory services including information and knowledge sharing through ICT
- Linkages, partnerships and collaboration at national, regional and International levels
- Biodiversity
- Climate change, land and water degradation
- Agro-forestry and afforestation
- Market-oriented, and socio-economic research for agricultural development

The seven group discussions provided good insights into the important researchable issues of different cross-cutting issues. The results of each group discussion were presented in Plenary Session which was followed by general discussion. The information on researchable issues was included in the exercise on the final voting.

Plenary Session

The final Plenary Session of the Workshop was based on voting on the key researchable issues identified during the two working groups using 16 flip charts and a sticker-based voting system

where each participant was given 8 votes to choose farmer categories and themes, and 14 votes to choose from more than 100 researchable issues. These votes were counted and results summarised by the CACAARI Secretariat.

Based on the results of voting on different farmer (producer) categories and themes, the priorities could be summarized as follows:

Category	Priority
Producer	
Crop producers	1
Forest dwellers	2
Pastoralists	3
Horticultural producers	4
Fisher folks	5
Cross-cutting issues	
Improving agricultural extension & advisory system	1
Improving agricultural research and education system	2
Extension, knowledge sharing and ICT use	3
Marketing of agricultural commodities;	4
Climate change	5
Gender/women issues	6
Biodiversity	7
Desertification	8
Land-related policies	9
Rangelands	9

The priorities on researchable issues (top five) under different categories of producers as rated by the participants could be summarised as follows:

Producer	Researchable issue
Crop producers	New improved varieties
	Improved seed
	Farm machinery
	Integrated pest management
	Soil fertility
Horticulture producers	Marketing services/advice
	Post-harvest processing
	New varieties
	Integrated pest management

Pastoralists (Animal producers)	Machinery Formation of cooperatives, private microenterprises Animal feed Improved breeds, insemination service, etc. Processing and marketing Animal health/disease prevention
Smallholders in mountains	Access to inputs (improved seeds/saplings/breeds, small farm machinery, credit) Soil erosion and conservation Conservation agriculture, crop rotation, organic farming Post-harvest processing, marketing Access to knowledge and extension services
Forest dwellers	Forest trees/improved plant varieties Livestock management Rangeland management Marketing of forest products Tourism and recreation

Most important researchable issues in CAC

Based on the voting results and an overall assessment during e-consultation and the F2F consultation, the 17 most important researchable issues, on priority basis, in the CAC region are summarised as follows:

Major area	Researchable issues
Agricultural extension	New type of extension services, farmer advisory services, use of ICT, improving capabilities of extension agents
Agricultural research and education system	Reorientation, greater investment, capacity building including information management technologies, changes in agricultural research management and funding systems
Crop production	Stress-tolerant improved varieties, improved seed, seed systems, integrated pest management, soil fertility, conservation agriculture
Water resources & irrigation management	Soil salinity, irrigation management, crop diversification
Climate change and desertification	Drought management (adaptation & mitigation), rain water harvesting, agro-forestry

Livestock Research	Animal feed, health management and productivity increase in small, mixed farm systems, animal producers cooperatives, milk/meat processing
Horticulture	Especially fruits, vegetables and vinery, marketing, post-harvesting, new varieties, integrated pest management, organic production, improved seed
Mountain agriculture	Access to inputs (seeds/saplings/breeds, farm machinery, credit), soil erosion, conservation, conservation agriculture, crop rotation, organic farming, post-harvest processing, access to markets, extension services
Biodiversity	Conservation of PGR & AGR, documentation, utilization, Gene banks
Seed systems	Seed production systems (public & private), availability of improved seeds of crops (cereals, potato, pulses, fruits, vegetables, forest plants and trees, etc.) and also animals and fisheries
Marketing of agricultural commodities	Linking farmers to markets, market-related information, price information, building market organizations (cooperatives, private companies)
Gender/women-related issues	Learning and education opportunities, capacity building for innovation, farm management, microfinance, access to markets
Rangelands	Degradation management, renewal & conservation, Conservation of biodiversity, water access
Forestry	Reforestation, forest trees/improved plant varieties, livestock and rangeland management, marketing of forest products, tourism & recreation, non-timber products
Agricultural development policies	Investment in agriculture, land tenure, access, ownership and land-related issues, promotion for availability of small farm machinery, marketing policies
Linkages, partnerships,	At national, regional and international levels:

collaboration	Between government, private entrepreneurs, donors and beneficiaries, between MoA and other ministries and research and education, among different counties and their research and educational institutions in common interest areas, with international organizations
Conflict & post-conflict areas	Conflict & post-conflict areas (Georgia, Armenia) Post-civil war (Tajikistan) Farmer displacement (Uzbekistan)

Identifying Appropriate Development Pathways

The results of the review process have provided some very useful information on ARD in Central Asia and the Caucasus. Now, the next step should be to identify appropriate development pathways which could be adopted in different countries of the region to get the desired development. For an example, for improving agricultural extension and advisory system, which was considered as the most important researchable issue for the CAC, would require different steps in the development pathway. This would require: identification of the requirements, need analysis, consideration of the existing models elsewhere or design new models, test implement them through action research, evaluation, advocating their replication and enlargement, and large-scale adoption. For this, new changes in policy, structures such as coordinating/regulating body, linkages, investment including of the private sector, capacity development, new information platforms, etc. The process is depicted below:

Action required	Researchable issue
Identifying requirements	New type of extension services, Farmer advisory services, Use of ICT, Improving capabilities of extension agents
Need analysis	Existing system and needs for the new type
Researching	Existing models elsewhere or design new models Test implementation them through action research Assessment and evaluation Advocate their replication and enlargement Large-scale adoption
Policy changes	National policy (for telecom) New structures such as a coordinating/regulatory body Linkages between research, extension and education Investment including private sector Capacity development New information platforms

In conclusion, the requirements of the TORs for F2F consultation meeting as per the guidelines of the GCARD process were fulfilled. The meeting also served a very useful purpose in identifying the major groups of producers, themes and important researchable issues. Now, the next step would be to identify appropriate development pathways to achieve the desired results.