**Recommendations**

**on enhancing innovation in agropastoral systems in Central Asia**

based on the outputs and outcomes of the online-Discussion on the

“The role of Agricultural Innovation Systems in Central Asia and Caucasus countries and China towards more sustainable food security and nutrition”

The results of the online-discussions (<http://www.fao.org/fsnforum/eca/en/AIS-CAC-China>) call for creating and promoting equal opportunities for participation and transparency among all stakeholders in the planning and implementation of agricultural research and innovation for development. 47 experts from 18 countries participated in discussion and provided their contributions to:

* What are the major challenges faced by Agricultural Innovation Systems to increase their role in improving food security and nutrition?
* What should be the priority areas for Agricultural Innovation Systems to effectively support farmers for improving their livelihood?
* What actions are needed to enhance agricultural research extension services and make them conducive to ensuring food security and improving nutrition?
* What is the current and what should be the future role of agricultural research and education organizations (academia) in the RAS systems?
* What should the partnership modalities be between academia and other stakeholders such as public organizations, farmer organizations and rural communities?
* What are the existing innovative institutions? And what are the major constraints?

Review of the contributions to the online-discussion revealed Following reflections are relevant enhancing innovation in agropastoral systems in Central Asia.

Agricultural Innovation Systems (AIS) in the region, particularly in agropastoral systems, is facing with avenues of challenges, which can be grouped into: socio-economic, institutional and management, research and technological, environmental, production and marketing (value chain), and policy issues.

There is a lack of coordination between different AIS actors, sectors and across countries. The linkage among the key stakeholders (such as the public and private sector, academic and civil societies) within the national agricultural research system in CA countries is very weak, which is reflecting on poor planning, resource and labour distribution, defragmentation and duplication of interventions in the agricultural sector. Existing interdepartmental and inter-sectorial barriers also hinder AIS programs, from planning to implementations. Insufficient linkages constraint an application of innovation approaches for improvement of food security and well-being of population. Functional linkages among agricultural education, research and rural advisory services remain weak. In spite of endowed high quality staffs, agricultural universities have been directed the majority of resources in teaching and researching.0

Moreover, AIS is constrained by additional problems such as ignored consideration of incentives at both individual and organizational level, weak research capability, insufficient training for agricultural producers and farmers and shortage in skilled professionals.

AIS could play a crucial role towards more sustainable food security and nutrition in agro-pastoral systems through an innovative infrastructure that enables interaction between academia and producers. However, AIS does not contribute at its fullest capacity today.

The further measures for strengthening Agricultural Innovation Systems at the national and regional are recommended to enhance agricultural innovations in the agropastoral system:

* Framing national policies, legislative, regulatory and institutions for agricultural innovation systems (AIS) in an integrated approach;
* Identifying farming technology and techniques which are suitable for climatic, socio-economic, cultural environment at the local level;
* Supporting agricultural actors along food chains to apply new technologies
* Promoting new high yield plant varieties resilient to disease and tolerant to draught, salinity, frost; promoting new animal breeds of high productivity and of a strong immune to diseases;
* Supporting modernization and diversification processes in agropastoral production system;
* Strengthening the role of gender, youth and low income population in agricultural innovation human capital development, including health, nutrition, education, and skills;
* Providing support in mitigation and adaptation to climate change;
* Improving data management.

Actions that are needed to enhance agricultural research extension services and make them conducive to ensuring food security and improving nutrition?

* Strengthening human and institutional capacity of AIS actors is required for boosting relevant agricultural knowledge and technologies and its applications:(a) Academia should be proactive and lead the implementation the training programs (including short and medium term training courses, on farm trainings); design curriculum of methods for participatory training; design and implement field experiments; conduct impact assessments; support graduate student research, workshops, farmer field schools, distance learning and other means; (b) universities should support farmers and rural small and medium enterprises in improving their skills, understanding and innovative capacity to practice sustainable agricultural intensification and market oriented activities.
* Enhancing linkages between research, education, and extension through interactive, dynamic and flexible process, and better contact between institutions. It will help bringing knowledge, technologies, and services to rural and agricultural population and improving their capacities to innovate.
* Establishing an agricultural innovation institution: it could serve as platform of knowledge formation and technology transfer where different actors of AIS can benefit from knowledge sharing, coordination and innovations.
* Improving access to finances: adequate funding for improvement of material and technical capacities.
* Marketing products and services provided by agricultural research, education and extension institutions: it will help attracting both public and private investors.
* Establishing of a unified information system: ICT serve as useful tools for development, transfer, application and dissemination of agricultural information and knowledge to increase agricultural productivity and income. However, there is still a communication gap between agricultural research, academia and rural areas. Eventually, massive changes such as ICT fast growth, urbanization and climate change require our knowledge and innovation systems to be far more responsive, flexible and forward thinking than before.
* Empowerment women and youth in agricultural innovations should be considered in development agenda. The participation of women and young people in agricultural innovations is indispensable, given their crucial role in household livelihoods, the socio-economic and cultural environment.

Recommendations to improve the role of institutions in AIS:

**Academia:** Agricultural research and education institutions play an essential role in AIS but it is challenging to institutionalize them with other RAS providers. Although agricultural research and education institutions have a variety of natural merits in AIS – such as to identify key research and capacity issues that are critical to FSN and wellbeing; to define interventions to increase the efficiency and sustainability of agricultural production and use natural resource; to develop and implement options to manage risk and production variability; to promote the use of indigenous knowledge, creativity and ingenuity in conservation and sustainable use of natural resources to improve the productivity and profitability of agricultural production through sustainable intensification, diversification, value-added products and market linkages; to identify the areas that are important to vulnerable populations, women and children livelihoods; to address the challenges faced by marginal farmers; and to develop new models of participatory and inclusive developments interventions and partnerships – they are constrained by fragmented sectors of conflicting interests and a lack of coordination within the AIS system. In addition, agricultural research and education institutions become a primary stakeholders in voicing for the poor and the vulnerable and in providing them with the means and capabilities so that the poor are benefiting from these innovations.

Additionally, the academia’s role in capacity building is paramount. For example, agricultural universities deliver formal and systematic courses and training programs to extension staff who eventually facilitate participatory learning with farmers, especially those vulnerable and disadvantaged groups such as women and youth for changes and innovation. In both CAC and China, it becomes crucial to deliver training to a new generation of agricultural specialists, scientists and service providers who can work with smallholders at the local level. Agricultural universities are important not only because they are developing human resources, but also serve as a source of knowledge and technology. In transition countries where the political views on RAS are volatile, the formation and accumulation of knowledge are relatively better maintained and deposited in universities through established curriculum, trained lectures, and set-up network.

**The Government:** The public sector is playing a central role in developing AIS in CAC countries and China. Nevertheless, in many of transition economies, the government interventions need to be enhanced, including the operationalization and institutionalization of national RAS systems.

To address an important socio-economic challenge such as food security and better nutrition, “the regulatory role of the government in innovative development objectively comes to the forefront; it will ensure positive results only in case of a balanced long-term development strategy”.

Information and communication technologies can help to build up linkages among public and private sectors in new and exciting partnerships that deliver real change.

**Recommendation beyond the topic**

Due to insufficient investments, agricultural research systems are not able to realize its full potential for contributing adequately into AIS. The average share of expenditures on agricultural research e in the gross agricultural output is 0.1% in CAC region, while the average value volume of investments in agricultural research as a percentage of agricultural GDP in developing countries is 0.58%, compared with 2.4% in developed countries. However, the investments in RAS may vary from country to country, we may assume that its value very low. Therefore, further discussions needed how to increase investments to R&D and RAS in the agropastoral systems to unpack its potential to improve food security and nutrition and to increase livelihoods.

*The proposed recommendations, should be highlighted and consulted in upcoming regional event relevant to the CRPs, FSN, AIS, R&D, RAS, engaging diversity of stakeholders.*

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