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Agricultural Extension in Central Asia: Existing Strategies and Future Needs

Jusipbek Kazbekov and Asad Sarwar Qureshi

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IWMI Working Paper 145

**Agricultural Extension in Central Asia: Existing Strategies
and Future Needs**

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and
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Collaborators

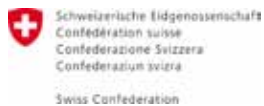


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Acronyms

ACTED	Agency for Technical Cooperation and Development
AD	Agriculture Department (applicable in Kyrgyzstan)
ADB	Asian Development Bank
AgBIC	Agro Business Innovation Centers (applicable in Tajikistan)
AIC	Agricultural Information Center (applicable in Tajikistan)
AICC	Agricultural Information Coordination Center (applicable in Tajikistan)
AIN	Advisory Information Network (applicable in Tajikistan)
AMTP	Alternative Machine Tractor Pools (applicable in Uzbekistan)
APF	Association of Private Farmers (applicable in Uzbekistan)
ASSP	Agricultural Support Services Project (applicable in Kyrgyzstan)
ATAC	Agricultural Training and Advisory Centre (applicable in Tajikistan)
ATC	Advisory Training and Information Center (new name: ZOKI)
AVEP	Agricultural Vocational Education Project (applicable in Kyrgyzstan)
BISA	Basin Irrigation System Authority (applicable in Uzbekistan)
BPP	Business Promotion Project (applicable in Kyrgyzstan)
BWMO	Basin Water Management Organization
CA	Central Asia
CECI	Centre d'étude et de Coopération Internationale
CGIAR	Consultative Group on International Agricultural Research
CIDA	Canadian International Development Agency
DAPI	Directorate for Agrarian Policy and Investments (applicable in Kyrgyzstan)
EBRD	European Bank for Reconstruction and Development
ESP	Extension service providers
FAO	Food and Agriculture Organization of the United Nations
GAA	German Agro Action
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (formerly Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH)
ICARDA	International Center for Agricultural Research in the Dry Areas
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
KAFC	Kyrgyz Agricultural Finance Corporation
KSAP	Kyrgyz Swiss Agricultural Program
LARC	Legal Assistance to Rural Citizens (applicable in Kyrgyzstan)
MAWR	Ministries of Agriculture and Water Resources of Republic of Uzbekistan
MAWRPI	Ministry of Agriculture, Water Resources and Processing Industry of Kyrgyz Republic

MEDA	Mennonite Economic Development Associates (mandated by CIDA for the implementation of the Pro-Poor Agricultural Development project)
MoA	Ministry of Agriculture
MoMWR	Ministry of Melioration and Water Resources of Republic of Tajikistan
MTP	Machinery Tractor Park
NAAS	National Agricultural Advisory Service (applicable in Tajikistan)
NGO	Nongovernmental Organization
PSP	Policy Support Project (applicable in Kyrgyzstan)
RAC	Rural Advisory Center (applicable in Tajikistan)
RADSF	Rural Advisory and Development Service Foundation (applicable in Kyrgyzstan)
RAS	Rural Advisory Services (applicable in Kyrgyzstan)
RBAS	Rural Business Advisory Services (applicable in Uzbekistan)
SANIIRI	Central Asian Research Institute for Irrigation
SDC	Swiss Agency for Development and Cooperation
SENAS	Support to the Establishment of a National Agricultural Advisory Service in Tajikistan
SEP	On-Farm Water Management Project (applicable in Kyrgyzstan)
SIC ICWC	Scientific Information Centre for the Interstate Coordination Water Commission of the Central Asia for Water Coordination
SITAF	Support to the setting up of a structure to provide information, training and advice to farmers and other rural businesses in the Khatlon Region of Tajikistan
SU	WUA support units (applicable in Kyrgyzstan)
TAIC	Training and Advisory Innovation Center (same as ZOKI, applicable in Kyrgyzstan)
TES	Training and Extension System, TES Center, Kyrgyz NGO
ToT	Training of Trainers
UDFB	Union of Dehkan Farms and Businessmen (applicable in Tajikistan)
UNDP	United Nation Development Programme
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
WB	World Bank
WPI	Water Productivity Improvement Project
WRD	Water resources department (applicable in Kyrgyzstan)
WUA	Water User Association
WUG	Water User Group

Summary

This paper provides information on the current status of the agricultural extension systems in Central Asia (CA), with special reference to Kyrgyzstan, Tajikistan and Uzbekistan. The report reviews the existing extension strategies, donor- and state-driven initiatives to revitalize the agricultural extension systems, informal linkages that nongovernmental organizations (NGOs) play in helping a limited number of farmers, and recommendations on ways to further improve the agricultural extension services in CA. The information related to each country was analyzed separately. This is because, after independence, each republic in CA had initiated their agricultural reforms with specific objectives, and have now established their unique agricultural systems that differ contextually. However, due to having the same history and agricultural system that existed during the Soviet times, these republics have many things in common. This paper (a) starts with a discussion of the modern definitions of the agricultural extension system to set the stage for the analysis framework (to establish a prism through which the existing extension systems within CA can be evaluated); (b) gives a historical perspective to the unified agricultural extension system; and (c) discusses the current status of the agricultural extension system. The report also reviews the current institutional set up and related policies that directly affect the existing agricultural extension systems, and identifies the limitations that need to be overcome in order to make improvements to these agricultural extension systems in these countries. The study shows that:

- since independence, countries in CA have undergone an economic transition from being centrally planned economies to market-oriented systems, and this did not include the creation of agricultural extension systems;
- except for some donor activities that were carried out to promote agricultural extension systems in CA, the initiatives were often not coordinated or consolidated;
- the needs of the three countries in CA (considered in this study) for having improved agricultural extension systems are not similar, but are urgent. There is a clear need that formal extension systems should be revitalized, and the key role in achieving this should be played by the state as mediator, supporter and facilitator;
- countries in CA have no national policy framework on the development of agricultural extension systems, which could ensure political and financial commitment from the government and other stakeholders; and
- In order to enhance agricultural extension systems, a national policy framework needs to be developed. This framework needs to indicate the priorities of national agricultural development and a viable organizational structure for implementation of these policies. The framework should also include the mechanism of farmers' involvement to increase their motivation and interest.

INTRODUCTION: CENTRAL ASIAN AGRICULTURE AND EXTENSION SYSTEMS

Agriculture is at the forefront of the development objectives of the republics of CA, Kyrgyzstan, Tajikistan, and Uzbekistan. Since independence in 1991, these three countries have undergone transitions from being centrally planned economies to market-oriented systems. These three countries – that were under the single agricultural policy of the Union of Soviet Socialist Republics (USSR) at one time and had a combined population of 37 million people (Kyrgyzstan – 5 million, Tajikistan – 7 million and Uzbekistan – 25 million) – went through tremendous, heterogeneous agricultural transformations and experienced varying degrees of economic growth.

These countries of CA have some of the largest irrigation schemes in the world, which were constructed during the 1960s. The average rainfall in these countries is 200-600 millimeters (mm) and evapotranspiration rates exceed 1,000 mm, which indicates that additional irrigation is necessary for sustainable crop production. Agriculture provides 20-40% of the gross domestic product (GDP) of these countries, with more than 22 million people directly or indirectly depending on irrigated agriculture (World Bank 2003).

Land reform and farm restructuring was a major component of the transition plan of each country. An extension service of old Soviet systems was incorporated within the former *kolkhoz* (a collective farm of the former USSR) system and supported through the centralized state. The farm had its own agronomists, veterinary experts, construction specialists, mechanical engineers, economists and irrigation engineers. Farmers were bound to follow pre-defined government instructions. The higher education system (universities and subjective technical universities) used to produce higher-level specialists (irrigation engineers, agronomists, biologists, mechanical engineers, etc.). Middle-level professionals were produced by *Technicums* (technical schools) and *Uchilishhe* (vocational institutes). The ministries of Agriculture, and Melioration and Water Resources were having their own specialized design and research institutes to deal with the different aspects of agriculture and irrigation. During the vegetation (weeding) and harvest (cotton picking) periods, all the students were sent to the rural areas to help collective and state farms with routine agricultural work as well as to gain some practical life experience. The complete agricultural production system was designed to spend tremendous amounts of money on large-scale production and higher-scale outputs.

Post-independence (from the Soviet Union) reforms in the agricultural sector in CA varied from country to country:

- In Kyrgyzstan, fragmented and small sizes of lands were under private ownership and they had the freedom to grow crops;
- In Uzbekistan, farming units were under long-term land lease (ownership) agreements, but the state had a quota system for the cultivation of the main crops (wheat and cotton) and fixed prices for these crops remained;
- In Tajikistan, some big collective and cooperative farms remained under private ownership. Although there was no official state quota, farmers were tied down with debts from old dismantled farms and were dependent on futurist companies, which influenced farmers' thinking on cropping patterns.

Nevertheless, every state had one similar problem. Before the reforms, as mentioned above, each *kolkhoz*¹ or *sovkhoz*² had its own specialists (agronomists, hydrotechnicians and head of the *kolkhoz*) with specialized training in agricultural education to manage the complete agricultural process within these big farms. After the reforms, each individual farmer was responsible for managing their piece of land without any special people in the background. In addition, there are other issues related to extension:

- Detachment of research from practice.
- Lack of state support for extension.
- Farmers had no accessibility to donor-driven extension services due to high costs and lack of awareness.
- Findings indicate the requirement of knowledge for ‘new’ farmers.

Agricultural extension in the countries in CA remains a challenge (Qamar 2002; KasWag AgriConsulting Worldwide 2008; EBRD 2008; Nazarov 2008). The creation of suitable extension advisory services in CA was not on the agenda of the agricultural reforms. The focus of the reforms was on the privatization of state collective farms (in Kyrgyzstan, partially in Tajikistan, and long lease periods in Uzbekistan) and the distribution of land amongst the public and hundreds of thousands of private farmers (semi-private in Tajikistan and state-owned but long-leased in Uzbekistan). The newly emerged farmers have different backgrounds (school teachers, doctors, police officers, etc.), have limited knowledge of profitable farming and are in desperate need of technical advice. They also need assistance in agrotechnical measures, marketing, inputs, irrigation, etc. The extension advisory services comprise mostly of those persons who worked as specialists on state farms or elsewhere in very narrow agricultural disciplines without any comprehensive knowledge of farm management. The only extension advisory services that exist at present are those supported by donors and based on projects. These are mostly private companies who are more interested in establishing expensive advisory units rather than helping poor farmers in the rural areas. As a result, agricultural productivity is declining.

During this study, the technical, discussion and country reports gathered from different sources (the Food and Agriculture Organization of the United Nations (FAO), World Bank, national organizations and other agencies working in this field) are reviewed. We have also analyzed the impact of rural development and strengthening of extension services in the late 1970s and 1980s (led by the World Bank (WB), FAO, Asian Development Bank (ADB)) on agricultural sustainability in the developing regions of Asia and Africa. Based on this analysis, this paper draws conclusions and makes recommendations that will help to improve the current agricultural extension systems in CA.

¹*Kolkhoz* - "... a cooperative agricultural enterprise operated on state-owned land by peasants from a number of households who belonged to the collective and who were paid as salaried employees on the basis of quality and quantity of labor contributed." (Source: www.britannica.com/EBchecked/topic/321400/kolkhoz).

²*Sovkhoz* - "state-operated agricultural estate..., titled as Soviet farm..., organized according to industrial principles for specialized large-scale production. Workers were paid wages but might also cultivate personal garden plots. Its form developed from the few private estates taken over in their entirety by the state in the original Soviet expropriations." (Source: www.britannica.com/EBchecked/topic/557139/sovkhoz).

DEFINING AGRICULTURAL EXTENSION

There is no single definition of ‘agricultural extension’ which is universally accepted or which is applicable to all situations. The general concept of extension is a function of providing the required and demand-based knowledge and skills for rural men, women and youth in a non-formal, participatory manner with the objective of enhancing their capacity to undertake farming operations to improve productivity and quality of life (Qamar 2002). Extension is concerned not just with physical and economic achievements but also with the development of the rural people themselves. This involves helping farmers in developing abilities to direct their own future development (Ameur 1994; Axinn and Thorat 1972; Swanson et al. 1990; Umali and Schwartz 1994; Rivera and Alex 2004; Neuchâtel Group 2002).

Over time, agricultural extension has become one of the available means to help alleviate poverty and improve food security, by promoting the transfer and exchange of information that can be converted into functional knowledge to develop enterprises for promoting productivity and generating income (Rivera and Alex 2004). Agricultural information systems for rural development are aimed at linking people and institutions to promote better sharing of agriculture-related technologies and knowledge. According to FAO/WB (Qamar 2002), the system integrates farmers, agricultural educators, researchers and extension workers in order to enable them to harness knowledge and information from various sources to improve livelihoods.

Traditionally, agricultural extension has referred to the work of a professional body of agricultural experts (often government employees), teaching improved methods of farming, demonstrating innovations, and helping farmers to organize and solve their problems. Extension has also served as a link between farmers to transfer the ‘best practices’ of one farmer to another, and as a channel to introduce – and sometimes enforce – agricultural policies. Agricultural extension presently encompasses a wide range of activities (in the public, private, nonprofit and nongovernmental sectors), but the exchange of information continues to be the primary focus of extension activities (Umali and Schwartz 1994).

The ultimate goal of agricultural extension is to increase the agricultural productivity of farmers, especially small-scale farmers. This involves technological modifications at the farm level and this depends on its impact on development and dissemination of improved technologies, and involves sociocultural and behavioral adjustments (Axinn and Thorat 1972; Ameur 1994; Swanson et al. 1990; Rivera and Schram 1987; Umali and Schwartz 1994). All these changes can only be institutionally possible through well-established links between the state, research, extension and private organizations (or NGOs).

Agricultural extension placed in the middle of the huge network of inputs, information and services is often highly inconsistent, particularly in more remote areas, especially in developing countries. Three out of four farmers in Asia have no contact with extension services (Maalouf et al. 1991). Therefore, the main task of the extension services, if organized properly, is to bring together and develop that network. However, the key role of extension services is to link research with farmers in a continuous way. Although it is not the job of extension services to provide inputs (such as fertilizers, seeds and machinery) and services (veterinary and irrigation water), they must make providers of such goods and services aware of farmers’ needs and to ensure that these services are provided properly – advocacy and information function.

Key Actors Involved in Agricultural Extension Services

There is a wide range of suppliers of agricultural extension services: the public sector (represented by ministries/departments of agriculture), NGOs, non-profit organizations (e.g., universities and commodity foundations), international research centers and the private sector. The private sector may include: (i) farmer associations whose membership is organized by locality or commodity; (ii) private production and marketing firms such as input manufacturers and distributors, agro-marketing and processing firms, and trade associations; and (iii) private consulting and media companies (publishing and telecommunication firms). Figure 1 shows the results of the worldwide survey that FAO conducted in 113 countries in 1989 (Swanson et al. 1990). The survey confirms the highly dominant role of the public sector in providing agricultural extension services. Approximately 81% of the extension work around the world is carried out through the Ministry of Agriculture or Department of Agriculture, at the national, state or provincial levels. Globally, some 600,000 extension workers are engaged in the provision of agricultural information to farmers (Maalouf et al. 1991; Swanson et al. 1990), of which 95% is carried out by public extension services (Rivera and Cary 1997).

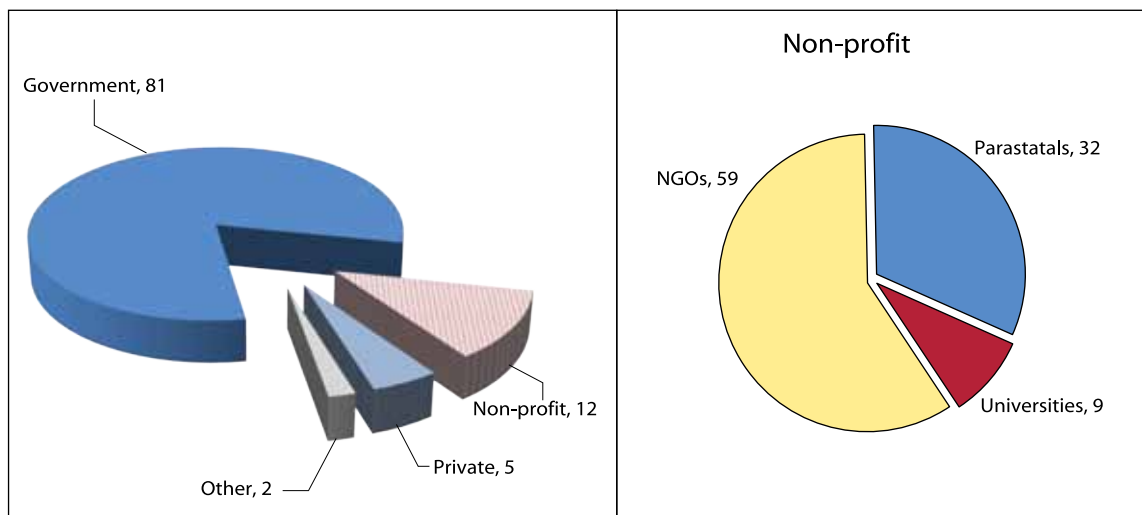


FIGURE 1. Distribution of extension organizations according to the worldwide survey conducted by FAO (Source: Swanson et al. 1990).

Several lessons can be learned from the reviews on the nature and extent of institutional participation in the delivery of extension services across countries. First, private sector extension is generally confined to commercially produced, often high-value commodities. A large bias towards catering to the specialized needs of medium- to large-scale farms also exists. Second, smallholders, if organized into associations, however, can be strong customers as well. Third, fiscal constraints are a pervasive problem in both developed and developing countries. Thus, strategies for (i) streamlining and cost recovery measures, and (ii) promoting the development of private sector extension services, are often necessary and unavoidable. This, however, does not necessarily imply the need for public delivery, because subcontracting to the private sector is also an option. Lastly, considering the limitations of the public sector and the selectiveness of the private sector, the participation of other institutions such as non-profit organizations and NGOs in delivering agricultural extension services will be crucial.

Figure 2 presents the key actors that are involved in agricultural extension services and the channels of delivery (Umali and Schwartz 1994). This generic scheme of major actors involved in agricultural extension is taken as the basis for assessment of the existing strategies in countries in CA: Kyrgyzstan, Tajikistan and Uzbekistan. Interrelational analysis between the actors was beyond the scope of this report. Three case studies are presented separately with special reference to their historical background on extension systems during the Soviet period.

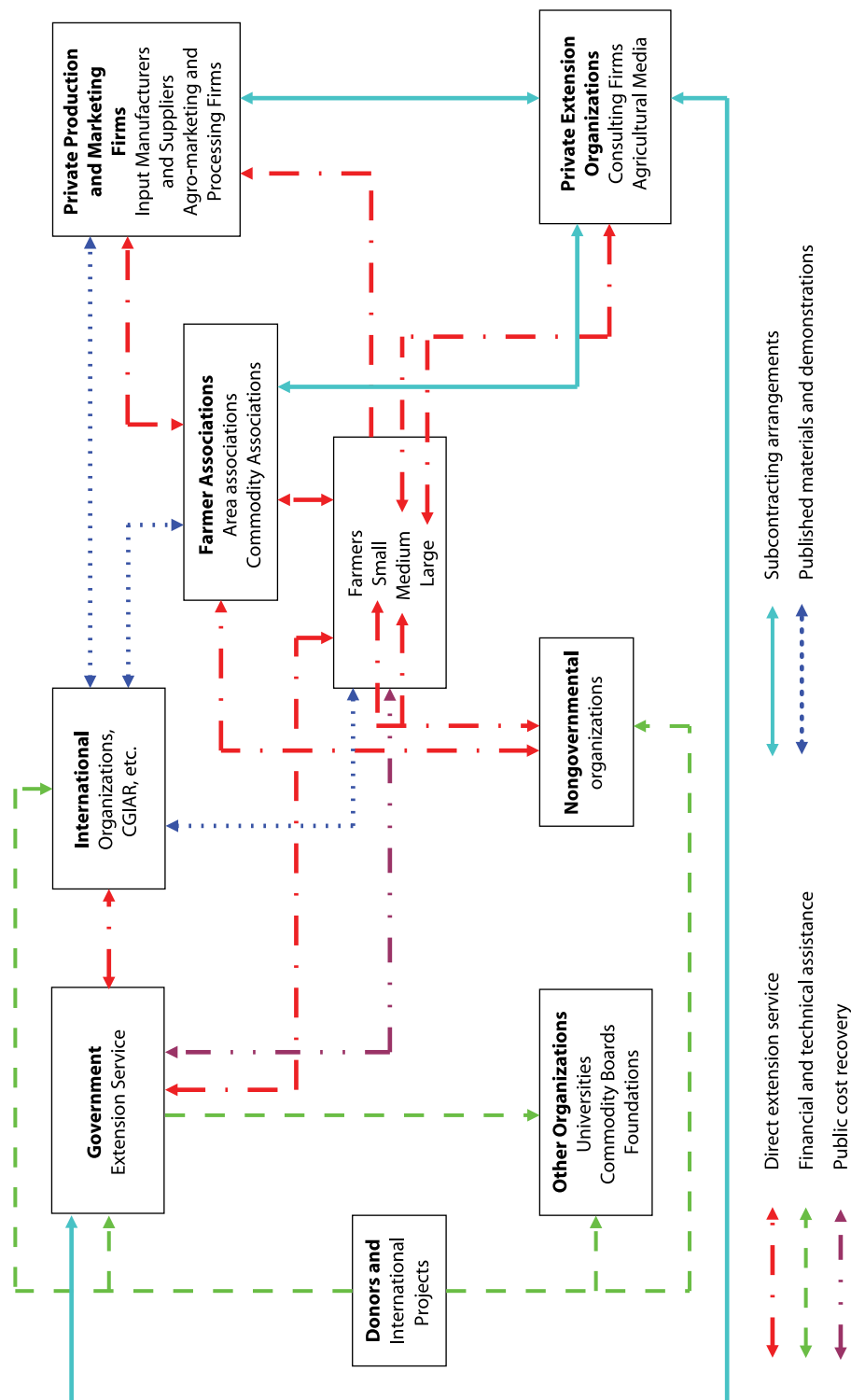


FIGURE 2. Framework for generic assessment of key actors (Source: Umali and Schwartz 1994).

HISTORY OF AGRICULTURAL EXTENSION IN CENTRAL ASIA

Agricultural Extension in the Soviet Union

The Soviet Union had an enormous agricultural research and extension system. The major agriculture-related research institutes were part of the USSR's Ministry of Agriculture under the Agro-Industrial Committee - a governing body of the All-Union Academy of Agricultural Sciences (referred to as VASKhNIL after V. I. Lenin). The research themes covered various aspects of the agricultural production process – plant science, genetic engineering, soil science, irrigation (Morgounov and Zuidema 2001; Pray and Anderson 1997). Regional institutes with a zonal mandate had extension services built in.

In 1929, a number of elite agricultural research institutes were merged into VASKhNIL. In the Soviet era, development of agricultural science reflected societal development. Since society was highly politicized by the Communist Party, the science was politicized as well. VASKhNIL had a dual role in the Soviet agricultural research system. It was both an association of institutes and an association of scientists. Its structure, and that of agricultural research itself, was marked by a constant flux. Over time, however, two distinct organizational patterns emerged. The first pattern, which dominated in the 1960s, was VASKhNIL as a union of a few specialized institutes, with a significant amount of agricultural research being conducted by institutes under the Ministry of Agriculture, outside VASKhNIL's management. The second pattern shows VASKhNIL as a giant organization managing almost all the agricultural research in the USSR with a complex structure of departments and regional branches (see Figure 3).

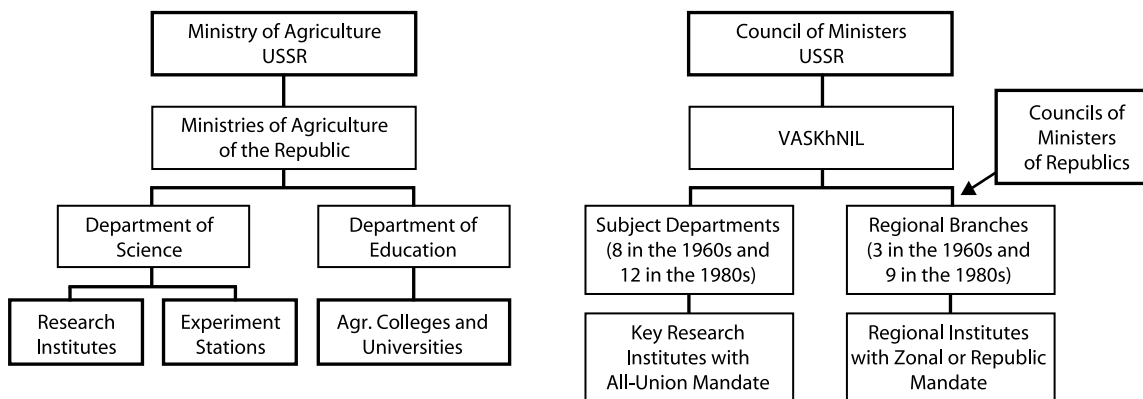


FIGURE 3. Agricultural research structure in the Soviet Union (Source: Morgounov and Zuidema 2001).

Regional institutes with a zonal mandate had extension services built in. For example, the CA regional branch of VASKhNIL was based in Tashkent, Uzbekistan.

Extension services at farm level were incorporated within the former *kolkhoz* system and supported by the centralized state. This was a large-scale production system that helped to increase crop yields. The farm had its own agronomists, veterinary experts, construction specialists, mechanical engineers, economists and irrigation engineers. The farmers were just left to follow their pre-defined instructions. The higher education system (universities and subjective technical universities) used to produce five-year higher-level specialists (irrigation engineers, agronomists, biologists, mechanical engineers, etc.), while specialized educational institutes such as *Technicums* (technical schools) and *Uchilishche* (vocational schools) produced middle-level professionals.

The Ministry of Agriculture and the Ministry of Melioration and Water Resources, which were two separate sectors at that time, had its own specialized design and research institutes which dealt with different aspects of agriculture and irrigation. During vegetation (weeding) and harvesting (cotton picking) periods, all students were sent to villages to help collective and state farms with routine agricultural work and to gain some practical field experience. The Soviet research and extension system proved successful to organize large-scale production systems and increase crop yields. A comparison of the yields obtained from the main crops between 1961 and 1990 are given in Table 1. While wheat yields almost doubled during this period, other crops also recorded significant increases in yields. However, some argue that these yield increases were more related to the increased use of fertilizers and farm machinery rather than research and extension services (Pray and Anderson 1997).

TABLE 1. Yields of major crops in the USSR between 1961 and 1990.
Source: adapted from Shend 1993.

Main crops	1961-1965	1986-1990
Winter wheat	1.49	2.99
Corn	2.28	3.39
Sugar beet	16.3	26.0
Sunflowers	1.13	1.45
Potatoes	9.5	11.8

During the Soviet era, the agriculture industry was developed along with an administrative bureaucratic structure, and an economic policy was defined on a short- and long-term basis. Extension services followed a commodity approach where efforts were concentrated on the technical, administrative and commercial requirements of different crops. Development of the agricultural industry and extension/advisory service systems during the Soviet era in CA (former Turkestan Autonomous Republic) can be divided into six stages:

- First stage (1917-1927)
- Second stage (1928-1932)
- Third stage (1933-1941)
- Fourth stage (1942-1945)
- Fifth stage (1946-1961)
- Sixth stage (1962-1990)

First Stage (1917- 1927)

During this period, the government took actions to nationalize the agricultural lands and irrigation facilities. During the process, agricultural lands were taken from big wealthy farmers, and were allocated to small local farmers (*Dehkans*) and the working class people. Cotton was declared as the major crop for the entire country whereas other crops such as wheat and other consumer goods were imported to the country. Main cotton committees (Boshpakhta Committee) were established to provide facilities for cotton farming, i.e., seeds, credits, agricultural machinery, fertilizers and

requisite agricultural implements, as well as grain and other products equivalent to sown raw cotton. These organizations also provided some agricultural extension services to farmers.

By the end of 1920s, more than 20 demonstration farms were established in the Turkestan Autonomous Republic. A team of 100 agronomists was established to educate farmers on cotton production techniques at more than 250 locations in the Republic. For development of the agricultural industry, three types of agricultural cooperatives were established:

- Agricultural cooperatives mainly engaged in trade, i.e., they acted as intermediaries.
- Agricultural cooperatives acted as a contracting party and also dealt with producers on behalf of the state procurement companies. In addition, they provided recommendations on monitoring of crop development, land treatment and irrigation practices. All the costs of these cooperatives were borne by procurement companies and the government.
- The third type of agricultural cooperative comprised of representatives from the procurement companies who acted as contracting parties to deliver sorted products to the state procurement companies.

These cooperatives were also extending their services by providing knowledge on agronomy, training of mechanization specialists and efficient use of the machinery, and establishment of pilot farms. Agricultural experiment stations were established at field sites where short-term agronomists, technicians and workers were responsible for extension services, part of which was funded by the central budget and the other part by the local budget.

In 1925, the Central Executing Committee (CEC) of Uzbek Soviet Socialist Republic (Uzbekistan) (UzSSR) adopted decrees “On Nationalization of Land and Water Resources” and “Land and Water Reforms” to enhance water resources management (History of Uzbek SSR 1968). As part of these reforms the government initiated the establishment of reclamation associations, which were similar to the present day water user associations (WUA). The major responsibilities of these associations included providing recommendations to the existing *Dehkans* on efficient water use, operation and maintenance of water supply systems, renovation of irrigation networks and development of new lands. These associations were fully funded by the government. Training of water resources management specialists was the responsibility of the Reclamation Engineering Department of Turkestan People’s University and Tashkent Hydraulics Technical College (Aminov 1983).

Second Stage (1928-1932)

During the second stage, collective farms (*kolkhoz*) were established in rural areas through the assembling of lands of small *Dehkan* farms whereas state farms (*sovkhoz*) were established with full support from the government. Seed farming and breeding works were improved, and research centers for seed farming were established. To carry out mechanization services, MTPs (Machine Tractor Parks) were established and improved. Agro-industrial centers were established under the MTPs, and training activities on agronomy and the efficient use of machinery were conducted. At sites, laboratory centers called ‘Yield Rooms’ were organized, where a range of short-term courses were provided to *Dehkans*. A number of research and higher education institutions were also established (Aminov 1983).

In order to improve training of the specialists in agriculture and water resources and to enhance the research in irrigation and drainage systems, the Research Institute of Hydraulic Engineering was transformed into the Central Asian Research Institute for Irrigation (SANIIRI) in 1932. The Tashkent

Institute of Engineers of Irrigation and Agricultural Mechanization (TIEAM) was established by merging two institutions of higher education – the Institute of Irrigation Technicians and Engineers and the Agriculture Mechanization Institute (Aminov 1983).

Third Stage (1933-1941)

During this stage, collectivization reform was completed for the entire country. The agricultural services sector was developed, and the level of machinery supplied and the number of trained technical staff was elevated. This led to improvements in agricultural production. To improve the efficient use of land and water resources and enhance the systems of water supply, water management facilities, pump stations and irrigation facilities were constructed. Agronomists, engineers and hydraulic engineers were recruited by *kolkhozes* and *sovkhozes*, and the training of *Dehkans* was further strengthened. Research institutes expanded their studies in all spheres of agriculture and achieved considerable results.

Recommendations of research institutions were delivered to farmers in the form of brochures and through guidelines of public administration authorities in the agricultural sector, and this had a good impact. Based on the recommendations worked out by research institutions (e.g., SANIIRI), new irrigation and drainage networks were constructed, new lands were developed, and training activities on the efficient use of land and water resources were enhanced.

Fourth Stage (1942-1945)

The fourth stage fell on the period of World War II, which caused changes in the crop production system by drawing food and equipment supply as well as technical specialists towards the Soviet Union Army. Production of wheat crops was extended along with technical crops like hemp and sugar beet.

During this period, crop production decreased due to lack of equipment and fertilizers as well as specialists who had been called up to participate in the war. In addition, soil salinity rates increased, and irrigation and drainage networks deteriorated. Considering this, during the war, political divisions were established under MTPs in order to put into practice the efficient use of resources in the agriculture industry. These MTPs were specialized in guiding the new workers, mainly minor children, women and old men, in the organization of the agriculture industry and efficient use of existing resources (Aminov 1983).

Fifth Stage (1946-1961)

During the fifth stage, attention was diverted towards the improvement of machinery supply and increasing its effectiveness. Improvement of lands - that were in poor ameliorative condition due to the recruitment of machinery and labor for World War II - was carried out. Attempts were made to provide MTPs, *kolkhozes* and *sovkhozes* with machinery and technical specialists.

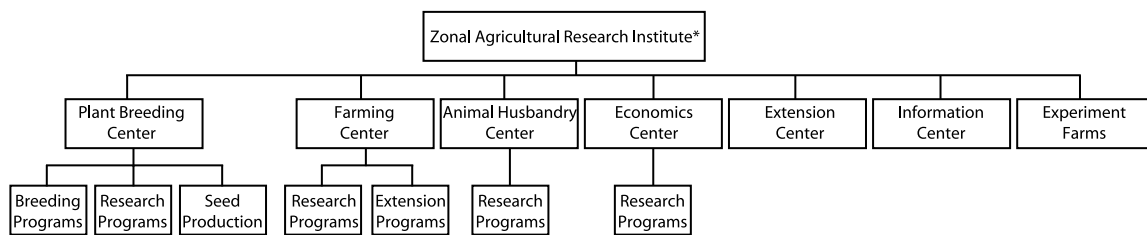
In order to introduce and train the workers in new and advanced technologies, *kolkhozes* and *sovkhozes* recruited new agronomists, engineers, economists and irrigation technicians. Chief specialists were selected from specialists of higher and secondary education, and they were invited to take extension courses. They were supplied with new and scientific literature directly by a number of research and higher education institutes through the regional and district authorities (Aminov 1983).

Sixth Stage (1962-1990)

At the beginning of this period, a number of measures were carried out on the development of new irrigated lands with new irrigation and drainage infrastructure, including the construction of reservoirs. Deserts in the Qarshi, Sherobod and Mirzachul zones were developed. Attention was paid to the provision of chief specialists to the *kolkhozes* and *sovkhozes*, the establishment of divisions through a vertical administration system, and also to the provision of agronomists and agricultural management specialists to the divisions. During the 1970-1980s, a cotton monoculture emerged in Uzbekistan. Emphasis was given to cotton farms, which were further expanded. Due to the necessity for crop rotation, livestock farming and partial areas of horticulture were advanced (Nikonov 1980; Penn 1977).

Specialized livestock and horticultural farms were established in the zones of the foothills and valleys. In order to improve integrated management, they were merged with processing companies into horizontal cooperatives, and agricultural and meat-packing plants were established (Nikonov 1980; Penn 1977). By the end of 1980s, the Former Soviet Union went through economic recessions, and shortcomings in the state administration structure became apparent. There were delays in the payment for the crops produced. The allied republics required using the system of market-oriented relations in making the payment, and this served as the main factor for failure of a system that was not ready for this.

The Soviet Union’s agricultural research and built-in extension system of the former Soviet republics of CA (Kyrgyzstan, Tajikistan and Uzbekistan) was a highly organized, fully funded and overcapitalized agricultural research establishment. The built-in agricultural extension system is presented in Figure 4. The new independent republics inherited a large number of research institutions and a huge complement of research staff. Evolution of their economies and agriculture, however, challenges these countries to reform their technological systems including extension to make it responsive and effective (Morgounov and Zuidema 2001).



- * Characteristics of a typical zonal agricultural research institute
- total personnel: 700 to 1,000
- total scientists: 100 to 200
- experiment farms: 3 to 5

FIGURE 4. Typical structure of a zonal agricultural research institute in the USSR in the 1980s (Source: Morgounov and Zuidema 2001).

PRESENT EXTENSION STRATEGIES IN CENTRAL ASIA

Agricultural Extension Systems in Tajikistan

The main actors in the public sector involved in the agricultural extension services are the Ministry of Agriculture (MoA) and the Ministry of Melioration and Water Resources (MoMWR). The MoA has not invested in the creation of extension advisory services in the country. Agroprom, run by the MoA, has officers in all *oblasts* and *rayons* but their role is mostly supervisory (reporting to *hukumats*), as well as collecting data for statistical purposes (including yield forecasting based on highly unreliable methods). In Tajikistan, four levels of administration exist: national, *oblast* (province), *rayon* (district or *nohiya*) and *kishlak* (village or *jamoat*). At each level, there is an executive body (*hukumat*) and an advisory body (*majlisi*). There are *oblast* (city) and *rayon* level administrations (*hukumats*), as well as village administrations (*jamoats*). The organizational structure of existing agricultural extension systems is presented in Figure 5.

The Association of Dehkan Farms and Businessmen was established in 1996 as a nongovernmental, independent and a self-governed social association. In 2003, the Association was reorganized into the Union of Dehkan Farms and Businessmen (UDFB) of the Republic of Tajikistan. The legal status of this association was again changed in July 2005, when the Union was re-registered as the National Union of Dehkan Farms and Businessmen of the Republic of Tajikistan.

The UDFB was responsible for supporting dehkan farms and business persons for the implementation and improvement of the market infrastructure based on strengthening and coordinating farms and entrepreneurs. It also protects the rights of dehkan farms and businessmen and works towards the improvement of qualifications and establishing links with foreign partners. However, so far this association has only had limited success. A serious detriment to the development of the association is the lack of a functioning board of directors. This was not a specific strategy of the decision makers when creating the management structure of the association. It was a consequence of the inability to communicate with members of the association and have their active involvement in the decision-making processes relating to policy and strategy development.

There are about 90 initiatives related to agricultural extension currently going on in Tajikistan and most of them are independent initiatives by different donors and projects, which are often small and duplicate the work of each other. There is no unified national level initiative to consolidate all the relevant extension services. In June 2008, key donors working in Tajikistan initiated the development of a Joint Country Support Strategy to improve the coordination of farmer services (legal, business and agricultural extension services).

Donors such as the UK Department for International Development (DfID), United States Agency for International Development (USAID), SDC, United Nations Development Programme (UNDP) and FAO are supporting the unified national Legal Aid and Extension Center Network rather than extending financial assistance to individual centers. It is hoped that the pooling of donor resources will allow a unified approach for the provision of farmer services, create a minimum standard of professional services, provide a single set of information materials for farmers, increase the likelihood of leaving behind a sustainable network, and provide a unified approach for monitoring and advocating the rights of farmers with the Government of Tajikistan. However, there is a need to build on what has already been developed over the past 5-7 years rather than creating another parallel system.

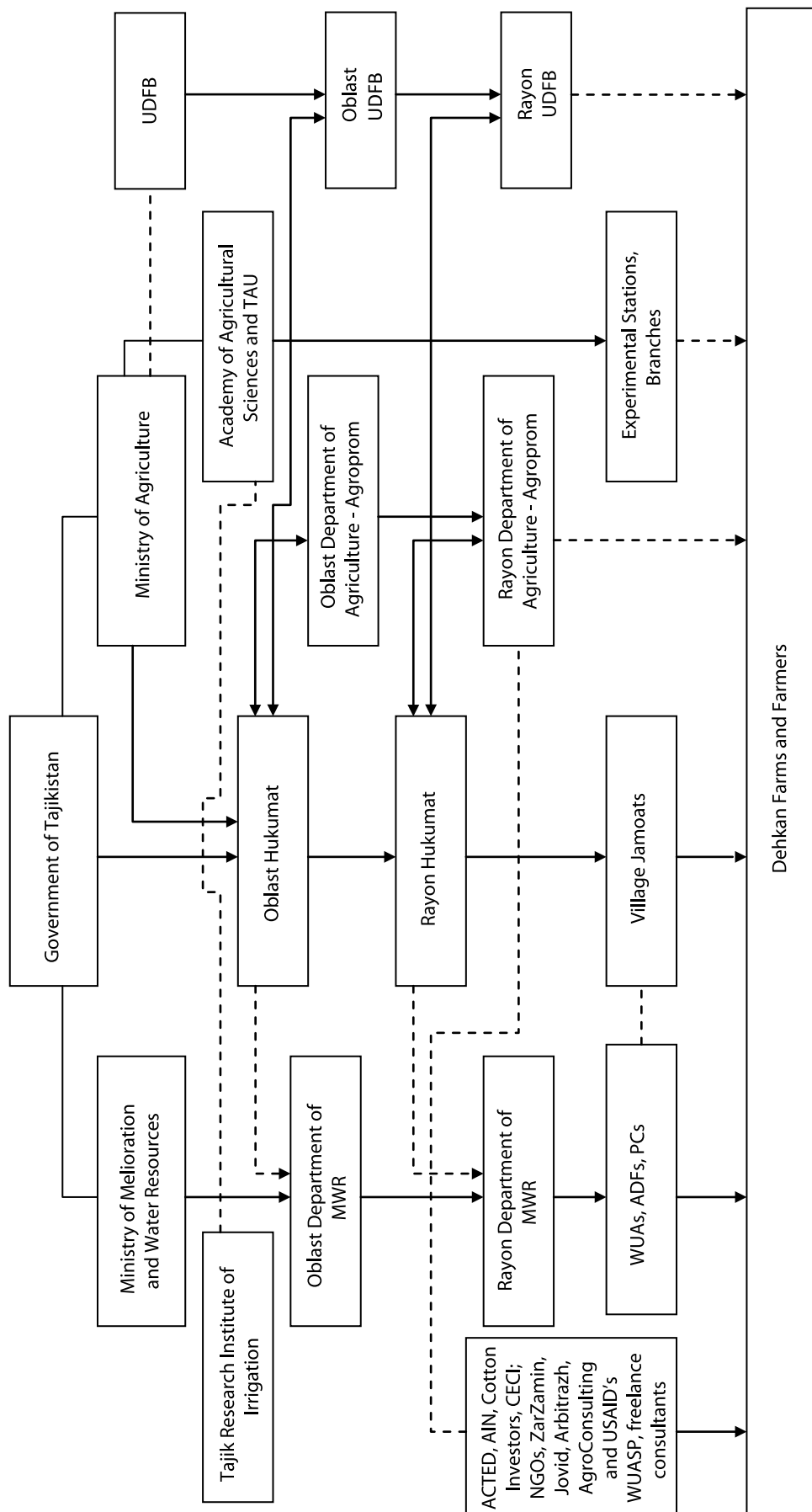


FIGURE 5. Existing agricultural extension linkages in Tajikistan (case from Sogd Province). Source: Rakhmatilloev 2008. Notes: WUASP – Water User Association Support Program; ADF – Association of Dehkan Farms; PCs – production cooperatives; MWR – melioration and water resources; TAU – Tajik State Agrarian University; UDFB – Union of Dehkan Farms and Businessmen.

Over the last few years, several efforts have been made by international organizations to revitalize the state and initiate public sector agricultural extension services. For example:

- In 2004, FAO with MoA established the Agricultural Information Center but this was stopped after funding ended;
- The project, “Support to the setting up of a structure to provide information, training and advice to farmers and other rural businesses in the Khatlon Region of Tajikistan” (SITAF), established a nationwide organization for extension service providers (ESPs), such as the Agricultural Information Coordination Center (AICC), which was meant for the coordination of research and education. Similarly, this too was stopped after funding ended;
- The International Center for Agricultural Research in the Dry Areas (ICARDA) initiated the Information Center with the Academy of Agricultural Sciences. However, this too stopped once funding ended;
- In 2006, the Technical Assistance to the Commonwealth of Independent States (TACIS) program by the European Union (EU) initiated the Rural Advisory Center with six Agricultural Information Centers (AICs), which was based on membership and registered with a NGO, Agricultural Training and Advisory Centre (ATAC); and
- In 2007, TACIS started a new project to support the establishment of the national advisory service in Tajikistan. Their specific objectives included strengthening ATAC and reinitiating Agricultural Information Coordination Centre (AICC), based on the Agroprom of the Sogd Province. NGOs also tried to convince MoA to establish a National Agricultural Advisory Service (NAAS) and support the UDFB of Tajikistan.

According to the project, Support to the Establishment of a National Agricultural Advisory Service (SENAS) in Tajikistan (SENAS 2008), the top priorities for Tajikistan’s agriculture are continuation of land and institutional reforms, resolution of the cotton debt issue, focus on better agricultural productivity, improving agricultural infrastructure and addressing food security issues. The role of the state and the Ministry of Agriculture will be revitalized.

According to EBRD (2008), there are currently about 29 ESPs that are active in Tajikistan, but only 11 have the institutional capability of training farmers. The survey conducted by EBRD shows that half of the 11 ESPs have some previous work experience in farm management and many of them are still dependent on donors for funds. Other weaknesses of these ESPs include limited geographical coverage and duplicating roles. Only two of the ESPs have cotton growing experience: Centre d’étude et de Coopération Internationale (CECI) in Khodjent has good ties with the Integrated Water Resources Management (IWRM) project; and “Znanie” (based in Dushanbe).

Various cotton investors employ agronomists and hydrotechnicians who provide basic training to farmers on how to grow cotton and implement irrigation. In most cases, consultants lack the background in agronomy and irrigation. According to KasWag AgriConsulting Worldwide (2008), some farmers perceive agronomists and hydrotechnicians hired by the cotton investors as checkers rather than extensionists.

Most of the existing extension initiatives in Tajikistan are donor driven and are related to specific projects. Many NGOs involved in local extension activities are also supported through foreign funding. There is no single wider initiative to integrate and coordinate all such activities. As a result, there is a lack of cooperation between these organizations, which often resulted in duplication of activities and there are many times when they are working in the same area.

According to SENAS (2008), there are four organizations that have developed their own extension systems:

- The Agency for Technical Cooperation and Development (ACTED) established an Advisory Information Network (AIN): one in Dushanbe with two sub-offices in Kurgan Tepa and Khodjent. They supported 16 Rural Advisory Information Centers (AIC).
- NGO Jovid, supported by the German Agro Action (GAA) and German Development Service, is based in Chkalovsk and their focus is the foothills and the mountains.
- The Association of Professional Agrobusiness Consultants, ZarZamin (Golden Earth), initiated by Mennonite Economic Development Associates (MEDA) and supported by the Canadian International Development Agency (CIDA), have an *Oblast* office in Khodjent and Agro Business Innovation Centers (AgBIC) in some districts.
- Agriculture Training and Advisory Centre (ATAC) of Kulyab, established by a previous project called SITAF, with a Rural Advisory Center (RAC) in Kulyab and six AICs.

Since 2009, IWMI and SIC ICWC have been implementing a project that focused on the improvement of plot level water productivity without having negative impacts on the environment, such as waterlogging and soil salinization. The project activities were implemented in three countries (Kyrgyzstan, Uzbekistan and Tajikistan) of the Fergana Valley. The country office of the project in the Republic of Tajikistan was located in Khodjent City and was coordinated by the Department of the Ministry of Water Resources of the Sogd Province. The project was implemented with the active collaboration of the four main partners: (a) Sogd Branch of the Tajikgiprovodkhoz Institute, representing the research component; (b) local NGOs such as “Sof” acting as an information processing entity; (c) “Irrigation-Agro Consulting” – responsible water related extension; and (d) “ZarZamin” - training farmers on the agronomic aspects of agriculture. The project has shown the effectiveness of involving numerous partners at different levels to address the needs of farmers in terms of available technologies and their adoption by farmers. It was the first attempt of its kind which has shown remarkable results. The project has a similar implementation structure in Kyrgyzstan and Uzbekistan.

The review showed that some private organizations and local NGOs have recognized the importance of the agricultural extension system while the role of the state is weaker and the institutionally sound agricultural extension system in Tajikistan is still missing. However, there is a need to develop a comprehensive extension system that integrates technical, financial, agronomic and irrigation aspects of crop production in which the main role of policy mainstreaming should be taken by the state.

Agricultural Extension Systems in Kyrgyzstan

Ministry of Agriculture, Water Resources and Processing Industry (MAWRPI)

The key functions of MAWRPI in relation to extension services include policy, technical and financial support for rendering extension services to help farmers increase agricultural production by means of delivering research results, preparing professional staff through education and development of new technologies. In particular, MAWRPI, in close cooperation with existing extension services and research institutes, integrates the development of relevant information and methodical guidelines on innovative methods of crop rotation, irrigation and tillage to farmers and agricultural producers, and provides assistance in extension services to WUAs on legal, accounting and technical issues.

MAWRPI has three wings – agriculture, water and processing industry. The Water Resources Department (WRD) has a strong organizational and hierarchical structure (Basin Water Management Organizations (BWMO) and Rayon Water Management Organizations (WMOs) serving WUAs) and its key and specific task is to organize water use in the national economy based on research, and on an equitable and rational basis. It has 7 (*oblasts*) BWMOs and 40 RWMOs.

The Agriculture Department (AD) has *oblast* and *rayon* structures, but is given a higher role in regional and local governance. It deals with a wide range of agricultural issues compared to the water department, e.g., livestock, crop production, fertilizers, machinery, pest management, etc. For example, the deputy governor of *oblast* and deputy hakim of *rayons* is the head of ADs. This wing also has a Research and Agricultural Development Department, which includes two to three research institutes: irrigation, land management and plant. It has indirect links with the Rural Advisory Services (RAS) and provides occasional trainings for Advisory Training and Information Center (ATC) staff through associated research institutes.

There is the Kyrgyz Agrarian University after Skryabin's name and the Osh Agricultural Institute. They are mostly responsible for education and preparation of professionals to serve in the water and agricultural sectors (engineers, researchers, etc.). However, the reforms in the political structure of the state made these organizations fall under the Ministry of Education whereas previously the educational and research institutes were part of the sectoral agency, MAWRPI. However, informal and methodological links still exist between the ministry and education.

WUA Support Units under MAWRPI

After collapse of the Soviet Union and the disbanding of state farms, on-farm irrigation was a problem. Many republics replaced their production brigades with WUAs. In the Kyrgyz Republic, with World Bank support, the WRD established WUAs to take over on-farm irrigation operation and maintenance (O&M). To ensure these were participatory, the Republic passed a WUA Law in 2002. To date, 451 WUAs have been legally registered under this law. As farmers had no experience with participatory associations, an intensive capacity development program was critical for success. Within the WRD of MAWRPI, the WUA Support Units (SUs) at the central (1), provincial (7) and district (40) levels were formed. International consultants and Central SU staff members provided more than 3,000 days of training for staff members of SUs. In turn, SUs have provided more than 47,000 days of training for WUAs. Interactions with SUs and intensive training have strengthened WUA boards and encouraged member participation. Monitoring data documents increased the efficiency of water delivery, while fees paid by WUA members have increased annually in every province. WUAs have now formed 14 WUA federations responsible for off-farm O&M (Johnson III and Stoutjesdijk 2008).

The World Bank's (WB's) On-Farm Irrigation Project supported the WUA SUs since 1999, with a USD 29 million project with two main components: (1) rehabilitation of on-farm irrigation infrastructure serving a minimum of 170,000 hectares (ha); and (2) development and strengthening of the associated WUAs to ensure the on-farm system is operated properly and maintained. In order to ensure that WUAs accept the responsibility for the on-farm irrigation system they are expected to repay 25% of the rehabilitation costs, spread over 7 years, with interest not to exceed inflation, as well as a four-year grace period. In addition to collecting service fees from their members to cover the costs of O&M of the on-farm irrigation infrastructure and the WUAs share of repayment for rehabilitation, WUAs are expected to collect the irrigation service fee (ISF) that is to be paid to the water service provider.

The team of WUA SUs includes people with expertise in WUA development, training and promotion, water and WUA legislation, financial management, and monitoring and evaluation. The following training materials are developed:

- WUA formation.
- WUA governance.
- WUA leadership.
- ISF establishment.
- WUA financial management.
- Irrigation water allocation principles.
- Irrigation system management.
- Irrigation infrastructure maintenance planning.

Under the Water Productivity Improvement (WPI) project (see section, *Agricultural Extension Systems in Tajikistan*), the WUA SU in the Osh Province acts as an extension agent complementing the RAS activities of the training of farmers in agronomic practices with a special focus on the efficient use of water. For example, in Uzgen, Karasu and Aravan districts of the Osh Province, a number of farmers are sharing water from the tertiary level outlets through selected and trained leaders of water user groups (WUGs). These leaders are introducing a system of water use that provides a platform for the setting up of WUGs. They are also introducing a system of water measurement through hydro-posts (weirs and gates) with methodological support for the transfer of water payment from a hectare-based to incentive-based volumetric system. Other trainings on the efficient use of water are also conducted.

The WUA Support and Regulation Unit and the RAS of the Osh Province work in close connection. Leaders of the outlets, trainers from the WUA Support and Regulation Unit and trainers from the RAS of the Osh Province work together, supplementing each other.

The recent WPI project was able to create a well-functioning partnership system, which links knowledge generators (research) with knowledge processors (information center) and existing extension services, that has good ties and trust amongst farmers. The partnership is based on the innovative cycle which is a system that continuously assesses farmers' needs and elaborates corresponding extension messages with regards to water (under the project) as a complement to the ongoing (without the project) agronomic trainings for farmers, and organizes compilation and dissemination of technologies based on existing local or previous knowledge.

Many donors are active in Kyrgyzstan, and a number of donor-supported initiatives and projects are related to agricultural extension. Several pilot activities, covering a few *rayons/oblasts* of the country, have been carried out in support of family farmers, with emphasis on the provision of technical and business advice, group organization and credit. These include projects by the European Union (EU)/Technical Assistance to the Commonwealth of Independent States (TACIS), Agricultural Training and Advisory Services (ATAS) in 1994 (sort of training and visit (T&V) system) and the Agri-Business Centers (ABC) projects. SDC aid (provided through Helvetas and Caritas) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (formerly Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH) started its advisory project in the *Oblast* of the Osh Province in the spring of 1997. The basic approach to the advisory services has been the same, in that the farm extension advisors visit the villagers on a rotational basis four to five times a week to provide advice. Advisory services and farmer organizations are also provided under the ongoing Sheep Development Project financed by the International Fund for Agricultural Development (IFAD)

and the World Bank. Implementation of this project commenced at the end of 1996. According to the project report, “the project has had an enthusiastic response from the farmers, group formation is progressing and farmers visit successful groups in order to learn from their experiences”.

Two other donor initiatives, also closely related to the Agricultural Support Services Project (ASSP), are UNDP’s field program of lending to joint-liability groups through its Poverty Alleviation Pilot Project and the World Bank’s Rural Finance Project which provides agricultural credit to agribusinesses and smaller farms through the Kyrgyz Agricultural Finance Corporation (KAFC). However, farmers below the poverty line who normally cannot afford collateral need additional support.

Kyrgyz Swiss Agricultural Project (KSAP) and Helvetas

In 1994, the Kyrgyz Swiss Agricultural Project (KSAP) of Helvetas started establishing a rural advisory service in mainly mountainous *rayons* of Kyrgyzstan with the help of Caritas in generating income with small-scale enterprises. The rayons included Kochkor-Jumgal in Naryn *oblast*, and Suzak, Bazar Korgon and Nookan *rayons* in Jalal-Abad *oblast*. At the beginning, each project had its own advisory topics which were linked to credits in most cases. In 1998, the approach was revised in all projects, when Caritas ceased advisory activities and went for an independent credit line. Helvetas discontinued credit and focused on technical assistance, and GIZ institutionalized the link with the American-funded Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA). In 1997, with the support of Helvetas, participatory advisory approaches were started in Kochkor-Jumgal.

Helvetas (Swiss Association for International Cooperation) has been active for 45 years as a development partner of governmental organizations and NGOs in 20 countries, and have been working in the areas of infrastructure in rural areas, sustainable use of natural resources, and education and culture.

Since 2001, Helvetas has been involved in implementing different extension projects:

- the Rural Advisory and Development Service Foundation (RADSF) through KSAP in the three *oblasts* Naryn, Issyk Kul and Jalal-Abad, and with specific activities on a national level in the fields of cattle breeding, support to agro-entrepreneurs and an agricultural coordination unit;
- Legal Assistance to Rural Citizens (LARC) in eight *rayons* of Jalal-Abad and *oblasts* in the Osh Province bordering Uzbekistan;
- Agricultural Vocational Education Project (AVEP) in Naryn, reforming the vocational education of young farmers (men and women); and
- The Business Promotion Project (BPP), providing entrepreneurs with marketing support and training through the start-up and growth phases of their business development, especially community-based tourism in Naryn and Jalal-Abad *oblasts*.

KSAP and LARC were implemented on behalf of SDC, which is also the funding agency for both projects.

RAS

RAS, a NGO initiated by IFAD, WB and SDC to deliver advisory and development services to farmers as part of KSAP, has the following objectives: (a) prepare and implement technical programs

in advisory services; (b) carry out on-farm demonstrations and field trials on farmers' fields at the request of farmers; (c) commission local adaptive research contracts; (d) manage staff in *oblasts* and *rayons* and maintain accounts; (e) liaise with local governments; and (f) disseminate information. RAS is a decentralized organization with branches in *oblasts* and *rayons*. Thus, RAS managers are responsible for the development of annual work plans for their respective *oblasts*, under the overall guidance of the local Oblast Steering Councils (OSCs). The OSCs which comprised of representatives of farmers, NGOs and government agencies from within the *oblast*, play the same pivotal role as the national RAS.

There are some questions with regard to the professional interactions which RAS developed with the local research, NGO and other organizations involved in agricultural production. Actually, the RAS has few links with the Kyrgyz Irrigation Research Institute where RAS uses its staff for its trainings. The linkages with the other research organizations are informal or nonexistent or sometimes occasionally based on specific tasks (non-systematic).

A national level coordination office receives all donor and government (to a lesser degree) funds, and contracts *oblast* and *rayon* advisory services (branches) on an annual basis. They are basically grown up units earlier established by different donor projects. The yearly contracts are based on annual work plans and there is a performance system to measure achievement compared to plans. RAS have introduced the planning process based on the bottom-up principle. RAS regularly upgrades the qualifications of its field staff. RAS maintains the exchange of experience and dissemination of useful innovations by providing training and consultations. Knowledge transfer is mostly done through the demonstration process.

The RAS has 41 *rayon* and 7 *oblast* offices; the ATC office operated on the national level. In each *rayon* office, there are 2 to 4 *rayon* advisors and various specialists on subject matter are working in each *oblast* office. RAS staff are normally selected on a competitive and contract basis. In order to meet the rural people's information and knowledge requirements, the RAS strives to render good quality services, oriented to a number of advisory topics. They cover a wide range of topics such as crop production, livestock management, machinery, marketing, farm economy, dissemination of innovations and knowledge, farm management, tourism, handicrafts, business planning, gender issues, small business projects and group development.

The RAS annual reports indicate some challenges and difficulties in implementing the tasks due to the low salaries of staff compared with other projects. This affects the motivation of advisers, results in outdated office equipment, ever-changing concepts of the RAS with its each new phase, indifferent attitudes of some RAS staff to their work, increased fuel price, increased office rent, outdated devices and vehicles entailed additional expenditure, and there being many obstacles to realize its mandate (wrong selection of farmers on some advisory topics, sharp decrease of budget, uncertainty about the future of RAS activities, political situation with weak support, unchanged level of staff salaries, whereas the living costs and inflation are increasing from year to year, and this results in losing well qualified advisors).

ATC

The ATC was initiated under the KSAP due to non-satisfactory development of the internal potential within the RAS system. The objective of the ATC was, "the overall capacity of the extension staff is improved through a well performing Advisory Training Centre" (ATC 2007). With the purpose of strengthening the RAS (extension) with knowledge management and capacity building, the autonomous ATC unit was formed within the RAS system like any regional RAS. The ATC specialists and contract trainers are working on farm development, business planning, proper use of

plant and livestock production technologies, home scale processing, and marketing, by improving the publication quality devoted to farmers and advisors. Besides, they are also involved in the implementation of the integrated pest management projects.

ATC roles include:

- **Acts as resource center.** ATC collects information, and processes, prepares, publishes and holds dissemination materials such as pocket leaflets, handbooks, books, electronic information, newspapers and journals on various aspects of agriculture such as pest management, crop development, agrotechnical measures and other subjects.
- **Acts as methodological and training center.** The Center provides training of trainers (ToT) on extension to RAS staff in *oblasts* and *rayons*. It develops training materials and methods for the local advisors depending on the demand for these materials. For example, in 2007, it trained 20 specialists from the regional RAS on potato pests and diseases. In total, ATC conducted 64 training activities for 755 participants. In its training activities it involves some specialists from the Kyrgyz Irrigation Research Institute and Kyrgyz State Agrarian University.
- **Provides marketing skills to RAS.** ATC provides trainings and required capacities on marketing issues to the *oblast* RAS, so that the branch organizations are self-sufficient and sustainable in the future when the funding stops.

Recently, the ATC was reestablished as TAIC, which is also participating in the WPI project (led by IWMI and SIC ICWC and supported by SDC) with an information center role to provide extension approach and ToT support to the RAS and WUA Support Units (SU) of the Osh Province.

TES Center

Training and Extension System (TES) is a Kyrgyz NGO specialized in rural advisory services. GIZ and the Osh State University founded TES in 1997. Their goal was to increase people's income from farming with the help of qualitative training and advisory work. It is based on private consultation with freelance field advisors and trainers served by the TES Center.

The focus of TES is on small farms with little to average resource endowment. TES assist farmers in forming interest groups. At the same time, these groups represent a starting point for self-help organizations with different ends such as common marketing and qualification for seasonal loans. TES supports and gives contracts to freelance trainers and field advisors to train and advise farmer groups throughout the year. Training in extension methods and agricultural technologies takes place mostly during the off-season. During the cropping season, TES coach these freelance advisors to better fulfill their roles of supporting farmers. In this way, every year, TES supports more than 50 agricultural advisors, more than 100 farmer groups, and between 1,000 and 1,500 farmers. In return, trainers and advisors pay an annual service fee to TES. Farmers pay a fee for each training that they receive.

TES has four departments (Organizational Development, Farmer School, Technical Advisory Services and Publications), bringing in external specialists, trainers and field advisors wherever possible. TES Center is headed by a management board of three senior staff. The Supervisory Board comprises of the founder (Osh State University), a major client (USAID), two TES staff members, and three freelance trainers and advisors.

From each group (consisting of 5 to 15 members) a leader is elected who receives a contract from TES to act as field advisor during the entire cropping season. This leader receives additional

training (technology and methodology) at TES Center every month or more often, and is expected to carry out practical demonstrations at the group's learning field as well as to monitor the crop of each group member, to organize joint input purchases, work out the delivery schedule with the processor and organize collection or delivery of the group's produce.

The practical demonstrations are about operations which have been discussed at the Center, for example, in the case of tomatoes, seedling production, field establishment, scouting for pests, predator release, working out fertilizer and chemical amounts, and anti-erosion measures in irrigation. The field advisor takes the responsibility on behalf of all farmers on the application and spraying of fertilizer. TES agronomists assess all farmer fields three times during the growing season, and according to these results, a gratuity payment to the field advisor is computed.

Recent developments to consolidate extension

The Policy Support Project (PSP) funded by the SDC was set up in 2007 with the aim of strengthening the capacity of MAWRPI through DAPI, in formulating and implementing agricultural policy by learning experiences and moderating processes. PSP has two key objectives: i) development of rural extension policy jointly with the RAS and KSAP; and ii) PSP assist MAWRPI in the coordination of agricultural projects. There are 61 donor-driven activities related to agriculture existing in Kyrgyzstan: 46 projects, 11 programs, 3 funds and 1 center. The donors are ADB, World Bank, USAID, GIZ, European Commission, UNDP, Swiss Government, Turkish International Cooperation and Development Agency (TIKA), Swedish International Development Cooperation Agency (SIDA) and Japan International Cooperation Agency (JICA). Figure 6 presents the current organizational structure of the main actors involved in agricultural extension in Kyrgyzstan.

Since 2010, Helvetas is implementing the SDC-funded "On-Farm Water Management" Project (SEP³). The aim of the project is to use a demand-driven extension approach by training farmers and local communities on the understanding of water as a limiting and important factor for agricultural crop production. SEP works with different organizations that are better linked with farmers (this may include local NGOs, agricultural extension services, WUAs, cooperatives and private businesses). The main approach is that local partners must submit proposals for their projects (which aim at building capacities of farmers in efficient water use at field level) within a duration of 6-18 months. The project has set up a local technical committee, which comprises the local stakeholders, who decide on the most innovative proposals based on SEP criteria. Only agreed projects are supported by SEP for implementation with guidance and supervision from TAIC. Currently SEP and WPI projects are exchanging its materials, reports and performing cross-project evaluation.

Agricultural Extension Systems in Uzbekistan

The process of reforms in the agricultural sector of the country that started in 1992, went through a number of stages ranging from (a) macroeconomic policy to the level of sustainability, (b) the rate of growth achieved as a result of conducting macroeconomic policy and market reforms by

³SEP means 'Efficient Use of Water' in the Kyrgyz language and SEP is the acronym of the Kyrgyz letters for this.

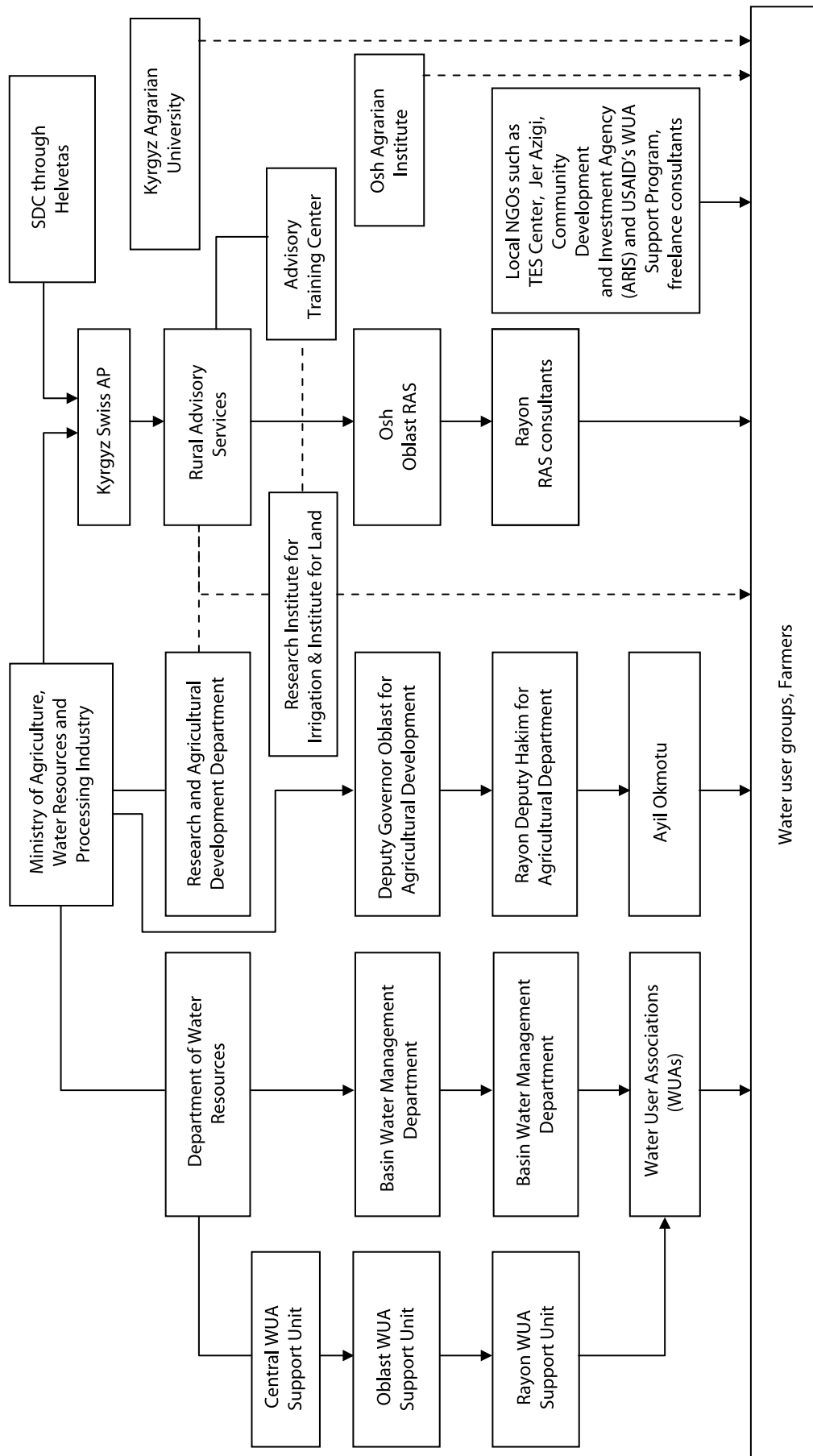


FIGURE 6. Existing agricultural extension systems in Kyrgyzstan (case from the Osh Province). Source: Jooshev and Mityakova 2008. Notes: AP – agricultural program; RAS – rural advisory services; WUA – water user association.

the government, and (c) initially during the reforms, property was denationalized and a pattern of nongovernmental ownership of property emerged.

In the first stage, the nongovernmental sector was made responsible for denationalization and privatization, and production of major agricultural output. Collective farms and collective property were set up instead of state farms and state-owned enterprises.

In the second stage, the collective farms were the staple producer in the agricultural industry; attention was directed towards the establishment of private farms and development of Dehkan farms. The state-owned livestock sector was sold through an auction to private livestock farms. Agricultural cooperatives (*shirkat* farms), private farms and Dehkan farms were selected as the prospective forms of farming on the results of economic experiments carried out at this stage of reforms, and in April 1998, new laws “on Agricultural Cooperatives Farms (*Shirkat*)”, “on Private Farms” and “on *Dehkan* Farms” were adopted.

Reforms associated with gradual liquidation of agricultural enterprises and their transformation to private farms is considered as the third stage of reforms conducted. The first steps were initial liquidation of *shirkat* farms that were operating at an economic risk and continued transformation of *shirkat* farms to private-ownership-based farms as well as formation of various enterprises, in particular, Alternative Machine Tractor Pools (AMTPs), WUAs and agro-firms, serving on their available technology and machinery base.

In line with these agricultural reforms, various forms of advisory services emerged. These advisory services developed during the stage of development of reforms, and were formed progressively and based on various patterns of ownership. Certain spheres were covered based on every type of service formed, and each of them corresponded to render specific services to agricultural enterprises based on universality and privatization principles.

The service sector and advisory services formed during this period are presented below:

- Collective farms were transformed to joint-stock cooperatives (*shirkats*). Here, the administration was democratized for the sake of appearance only; the economic management board and the main specialists were maintained. The existing divisions were named *shirkats*, and thereby the service and training measures were continued as they had been implemented before.
- Measures to transform the *shirkat* farms in bulk to private farms were carried out and tested. WUAs and AMTPs, as well as agricultural input production services, were established.
- A new structure, Association of Private Farmers, was established in the Republic. Its branches in the regions and districts were also formed, and the association was responsible for providing support to private farmers including assisting in the development of production activities.
- The basin water management system was adopted in the water sector. Their task was to organize water resources in the territory in a reasonable way and arrange measures for improvement of irrigated lands.
- The private service sector was developed and started servicing on the basis of legal and information spheres.
- Advisory services were formed to assist in the production and organizational processes through projects operating with financial support from foreign donors, who served the development of the newly-formed spheres, e.g., WUAs and retail markets.
- The system of receiving education and extension in the developed foreign countries was put forth for the enterprises engaged in the agricultural sphere, and qualified specialists

were now invited directly for the specialists working in agriculture. The experiences gained from them were implemented at sites.

- Research institutions started conducting to-government-order research work on requisite projects on a competitive basis only, and the results achieved were submitted to State Science and Technical Committee and thereby forwarded for direct adoption by the related ministries. In addition, research institutions acted on the order of agricultural enterprises.

The next stage was remarkable with the liquidation of *shirkat* farms (which were the largest forms of agricultural farming), their complete transformation to private farms and allocation of lands on a long-term lease to private farms, and the formation of infrastructural facilities serving the newly established private farms on the base of the liquidated private farms. Presently, advisory services to specialized private farms are being developed. Programs for training and retraining farm managers are worked out, and foreign and local specialists are recruited for their training.

During a short period of implementation of reforms, the agricultural service sector developed significantly as shown below:

- Maintenance and transport servicing (MTPs under government control, limited liability AMTPs based on farm property, private MTPs, machine pools of technical and pilot establishments under the control of private farmers).
- Agrochemical services (regional and district divisions of *Uzqishloqkho'jalikimyo*, fertilizer selling posts, pesticide laboratories established as a result of privatization, and reorganization of agrarian and chemical laboratories under former *shirkat* farms, Goskarantin State Inspection, Republican Center for Plant Protection and its branches).
- Reclamation and water management service (Basin Irrigation System Authorities (BISAs), WUAs, private enterprises).
- Construction services.
- Zoological and veterinary services (veterinary divisions under government supply at the districts and veterinary sector related to private sector).
- News and consulting services.
- Logistic support services.
- Agricultural product selection, preparation, recycling and storing services.
- Accounting, financial analysis and audit services.
- Services of research and special programs based on large-scale projects.

There are several reasons for rapid development and diversification of services in the service sector, i.e., the new establishment of such types of farms, small areas of lands, monopoly conditions of service enterprises, their distant location from agricultural producers, weaknesses of the material and technical basis, stress of funds, constraints in credit borrowing, imperfection of leasing relations, and a number of other legal and economic issues.

During the past several years, the government has been trying to find ways for sustainable development of the agricultural sector. In this regard, the Ministry of Agriculture and Water Resources (MAWR) is a responsible organization for the coordination of all agricultural activities including extension service to the farmers in Uzbekistan.

As a part of this, MAWR initiated several reforms in the agricultural sector including (i) the creation of private farms in the territory of old *shirkats*; (ii) establishment of Association of

Private Farmers (APF) with offices in each *oblast* and *rayon*; (iii) introduction of BISAs within inter-farm systems and WUAs for on-farm systems; (iv) creation of Alternative Machine Tractor Pools (AMTP); and (v) formation of agro-firms to assist the dehkhan and private farmers involved in fruit and vegetable production.

Figure 7 depicts the structure of several organizations that provide some elements of agricultural extension services in Uzbekistan. Some of these organizations are government funded, and some are funded by NGOs, universities, farmers' associations, research institutes and others. These organizations are:

- Association of Private Farmers (APF)
- Rural Business Advisory Services (RBAS)
- Agricultural Service Center
- Agro-firms
- BISAs
- Rayon Agriculture and Water Resources Authorities (*Rayselvodkhoz*)
- District polygons initiated by MAWR
- WUAs
- Alternative Machine Tractor Pools (AMTP)
- Academic and research institutes: Uzbeks Agriculture and Production Center, SANIIRI, Tashkent Institute of Irrigation and Melioration (TIIM) and Tashkent State Agrarian University (TSAU).

Despite all efforts, current structural frameworks do not completely meet the needs of farmers. Undefined structural and organizational parameters, lack of stimulation gear and remuneration of labor, and lack of integration of the interests of producers and service providers are some of the problems. In addition to the factors mentioned above, dominating administrative methods of work are not letting the world-renowned technologies and progress in agricultural research to make its way to the farmers' fields.

Development of an agricultural extension service in Uzbekistan is becoming a matter of national importance. However, there is no national policy framework on extension service development, which could ensure political and financial commitment of the government and other stakeholders.

In the development of an effective extension service, a national policy framework is a basic concern, since it should indicate national agricultural development priorities, outline the organizational structures necessary to implement these priorities and the corresponding institutional linkages, and the extent and nature of the commitment required to encourage farmers to act in a manner supportive of national policy.

In addition, there is little incentive among farmers involved in the production of state-ordered crops, cotton and wheat. This is different among the farmers involved in the production of fruits and vegetables, where use of informal extension services is in practice and in high demand.

Since 2009, in Uzbekistan, partners of the WPI project and SANIIRI, as a research organization, got together to search and analyze the existing research materials and generate new knowledge with regards to the efficient use of water. The functions of the Information Centre in the project are carried out by the former provincial experts of the IWRM-Fergana project, who have worked in the project since 2002 based in Andijan BISA. The Syr-Darya-Sokh BISA in Fergana, Naryn-Karadarya BISA in Andijan and Naryn-Syr-Darya BISA in Namangan provinces were selected

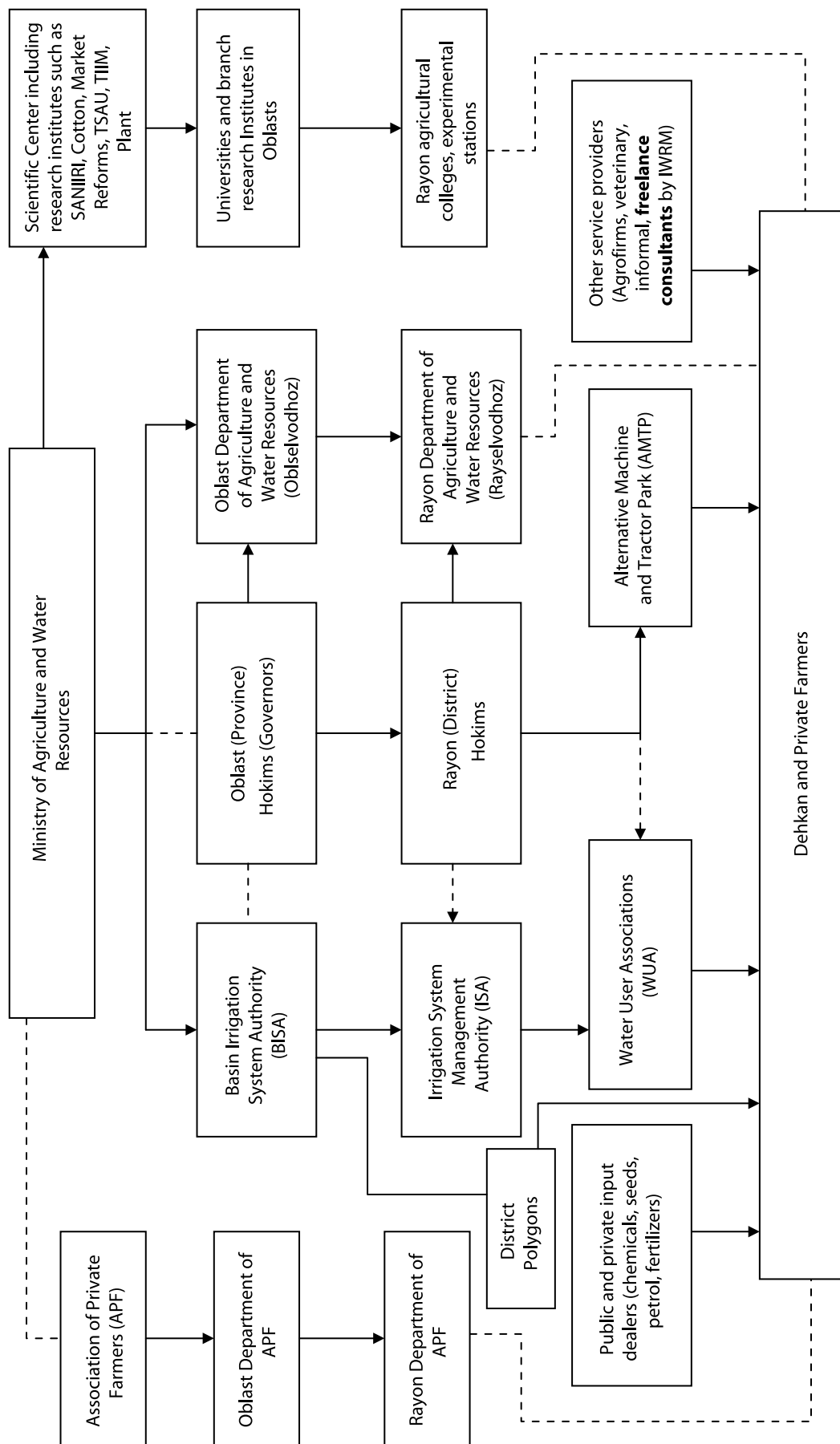


FIGURE 7. Existing agricultural extension systems in Uzbekistan. Source: Nazarov 2008. Notes: SANIIRI – Central Asian Research Institute for Irrigation; TSAU – Tashkent State Agrarian University; TIIM – Tashkent Institute of Irrigation and Melioration.

to play the role of extension agencies by providing training for farmers on effective irrigation technologies. The project considers consultations and training in 13 districts:

- Five districts of Andijan (Bulakbashy, Marhamat, Shahrihan, Pakhtaabad and Oltynkul);
- Five districts of Fergana (Tashlak, Kuva, Altirik, Baghdad and Furkat);
- Three districts of Namangan (Pap, Naryn and Namangan).

Through the training centers of BISA, farmers get training in the farmer field schools of the selected WUAs where BISA trainers and advisers render regular consulting services to about 150 farmers that cover 7,784 hectares. One trainer-adviser is assigned for each demonstration field, who works both at the demonstration field and with all farmers of the selected WUA as well. In WUAs, one expert is selected among the others who work in close cooperation with the farmers and trainer of the demonstration field as well, as the trainer organizes the farmer field school in the WUA.

Each trainer carries out the monitoring of farmers' fields and since the trainer is an expert, this elicits the needs and requirements of farmers and reveals shortcomings and mistakes made by the farmers when irrigation and agro-technical activities are performed. As stated in previous sections of this report, which were dedicated to the analysis of the existing extension systems in Tajikistan and Kyrgyzstan, the WPI project is trying to fill the gap between research and extension and make sure that knowledge of technologies that can help to increase the efficiency of water use reaches the farmers in a simplified form and in an understandable manner. The absence of the extension services in Uzbekistan did not stop the project, which decided to work with existing BISAs as the organizations are closely related to farmers in delivering their water.

POST-INDEPENDENCE CHALLENGES

Tajikistan

Rakhmatilloev (2008) indicates that the following key problems hamper improvements in the performance of Tajikistan's extension services:

- Lack of state financing. Insufficient financial support from the government that is required to provide farmers with extension services, to introduce new technologies that lead to the effective use of resources, to conduct field research at farm level and disseminate positive practices among farmers.
- Organizational insufficiency. There is no single government body to coordinate numerous consulting, donor and state activities in the water and agriculture sector.
- Poor technical facilities and lack of qualified specialists. Lack of modern knowledge and capacity, computers and training equipment; there is a need for new and younger staff, and the retraining of existing personnel.

There is a contrast of agricultural extension service providers – two extremes exist: from one side, there is a strong administrative state organizational structure but with weakened capacities and misled staff with overlapping tasks; and from the other side, numerous good skilled and active NGOs supported by donor-specific projects, very scattered and duplicated with a lack of communication between each other and questioned sustainability.

KasWag AgriConsulting Worldwide (2008) identified the following needs at the Dehkan farm level:

Governance

- Farm financial management (book keeping, accountability, finance procurement, reporting)
- Farm business management (budgeting, cropping activities, input procurement, shareholder participation)
- Extension services

Agronomy

- Crop management (irrigation, pest control, weed control, nutrition)
- Water management (cropping practices, irrigation scheduling/allocation)
Soil fertility (crop rotations, organic matter, green manure, mineral fertilizers)
- Genetic characteristics of cotton (varieties, seed quality, seed increase)
- Extension services

Resources (infrastructure/equipment/finance)

- Input supply (fertilizers, fuel, pest control agents, etc.)
- Water supply and distribution (WUAs, maintenance, rehabilitation, gates, regulators, irrigation scheduling)
- Machinery and equipment (improvements, efficiency, new technology)
- Finance (access to cropping and capital investment finance)

The concept of public extension and the provision of continuous advice to farmers are not widely understood. There is no institutional extension system existing in Tajikistan. The state organizations practice a top-down and order approach when working with farmers.

Research, education and agricultural policies are isolated from each other. The state funding is being decreased. The management of all three aspects is highly centralized and strictly controlled.

The bulk extension is now provided by a number of projects and NGOs. They are geographically focused and based on a subject and have a limited reach. There are some signs of cooperation but this seems to be occurring to a limited extent. Many overlapping and duplications exist.

Kyrgyzstan

KSAP (2007) indicate the following issues with the existing rural extension services in Kyrgyzstan:

- Insufficient financing of agricultural extension services by the Government of the Kyrgyz Republic. At present, extension services are mainly funded by donor organizations. This cannot last forever and by 2011 the funding can be terminated.
- Weak coordination of agricultural extension service activities by MAWRPI. Actually no one subdivision of MAWRPI work in this area.
- Inadequate level of knowledge in the application of new agricultural technologies, economic issues and marketing.
- Weak interrelationships between extension services and the scientific-research and educational institutions, and also with production and processing organizations.

- Insufficient number of trained extension staff.
- The vision of MAWRPI for further development of rural extension services does not coincide with that of the RAS.
- The attitude of MAWRPI towards state allocation of funds for financing rural extension services is not clear.
- National authorities are not ready to consider extension services as a priority of the agrarian policy.
- High turnover of senior management of the Ministry constrains promotion of the extension policy.

The survey conducted by Jooshev and Mityakova (2008) indicates the following knowledge requirements of farmers:

- Agro-technical measures (tillage, planting time, crop cultivation, inter-row cultivation, layout and crop rotation).
- Irrigation techniques (irrigation terms and irrigation depths, how to receive water, where, when and how to apply), farmer rights and relations with WUA, how much to pay for water, how to determine the volume of water received, measurement of water flow in *aryk* (small irrigation canal), measuring devices, water losses, how to determine water flow in a furrow and how to identify furrow length, determination of dependence between water penetration of soil, slope, and types of crops.
- Marketing service (what crop is profitable for planting in the current year, what seeds are fruitful, where and how much seeds may be bought).
- Application of fertilizers and chemical protection of plants.
- Introduction of new irrigation technology (sprinkling irrigation, drop irrigation, etc.).
- Basic economic knowledge on drawing up of business plans, marketing, estimation of efficiency of capital investments, estimation of actual first cost of output, its price, estimation of efficiency and choice of the optimal development directions of agricultural production.
- Legal regulations of land and water use, organization of farms, acquaintance of farmers with their rights and obligations to the state, taxation rules and payments of taxes.
- Opportunities and rules of attraction of investors, drawing up of credits and mortgages, establishment of the credit unions.

Uzbekistan

Nazarov (2008) concludes that in Uzbekistan there is no organization that could fulfill the functions of an agricultural extension system, but there are organizations providing elements of extension services. In addition, Nazarov (2008) identified the major gaps in infrastructure, institutional arrangement and availability of extension materials.

To identify gaps, a survey was conducted among 198 farmers located in 8 *rayons* of 5 *oblasts* of Uzbekistan (Nazarov 2008). The survey results showed the following:

- Of the survey participants, 93% indicated that they use services in the agronomy area (agro-technology, pest control and others), 89% indicated using the advisory service in on-

farm water resources management, 84% indicated using the advisory services in economic aspects, and 75% indicated using advisory services in legal aspects. The least used services were cattle breeding (3%), veterinary services (20%) and information advisory services (20%).

- With regards to questions related to on-farm water management and water productivity, the priorities of survey participants were (i) land reclamation (83%); (ii) water distribution and water measurement equipment, structures and installation (77%); (iii) crop water requirements and irrigation management (water savings) (65%); (iv) types of advanced irrigation technologies (drip, sprinkler) and their implementation (31%); and (v) others (8%).
- Answering the question, “*Are you ready to pay for advisory services that meet your needs?*”, 78% of survey participants agreed to pay if a high quality and efficient service was provided, 6% indicated that they were already paying for these services, and 16% indicated that “free was better, even if it was not satisfactory”.
- Answering the question, “*What types of services need to be developed?*”, 24% of survey participants indicated agronomy (agro-technology, pest control and others), 17% indicated economics (accounting, business plan development), 24% indicated on-farm water management, and 21% indicated that there was ‘no need’ for development of services. A reason for this could be that many farmers are not familiar with extension services and some are afraid that they would have to pay for the services.
- Answering the question, “*What is the best way to extend the knowledge about advanced technologies in agriculture to the dehqan and private farmers?*”, 43% of survey participants indicated that the best way was to establish demonstration fields and conduct demonstration activities, 38% have chosen the provision of different training programs and seminars, 12% chose books and brochures, and only 7% have chosen the use of mass media (newspapers, journals, radio, TV) as the best way to extend agricultural knowledge.

The major gaps in infrastructure that were identified are as shown below:

- Lack of financial resources
- Lack of physical facilities (transportation, office equipment, communication facilities, audio-visual aids)
- Lack of technical specialists
- Inappropriate management structure
- Influence of local authorities
- Lack of farmers’ knowledge and incentive for extension services

The major gaps in institutional arrangements are as shown below:

- Lack of government commitment
- Lack of correspondence between state functions and routine activities
- Lack of coordination among extension organizations that are causing service duplications
- Low capacity

The major gaps in availability of extension materials include the following:

- Too technical
- Not farmer friendly
- Inappropriate languages
- Not location specific

POLICY IMPLICATIONS TO IMPROVE AGRICULTURAL EXTENSION IN CENTRAL ASIA

There is no single blueprint recommendation that can be blindly adapted to any region's case. The case of CA is unique and has contrasting changes since its independence from the Soviets. Each region has selected, and is experiencing, its own way of transition. Therefore, this section is attempting to generalize and recommend some general concepts but with more careful consideration of local conditions and after cautious review of existing extension systems with detailed analysis.

Farrington (1994) suggested the following functions for extension:

- Diagnosis of farmers' socioeconomic and agroecological conditions, and their opportunities and constraints.
- Message transfer through direct contact between extension agent and farmer or indirect contact involving intermediaries such as 'contact farmers' or voluntary organizations, through training courses and mass media. Messages may comprise advice, awareness creation, skill development and education.
- Feedback to researchers on farmers' reactions to new technology in order to refine the future research agenda.
- Development of linkages with researchers, government planners, NGOs, farmers' organizations, banks and the private commercial sector. In remote areas, extension agents have taken on a number of these functions directly.
- Monitoring of the extension system and evaluation of its performance at farm level.

Six principles suggested by Neuchâtel Group (2002) form the common framework for agricultural extension:

- A sound agricultural policy is indispensable.
- Extension consists of 'facilitation' as much if not more than 'technology transfer'.
- Producers are clients, sponsors and stakeholders, rather than beneficiaries of agricultural extension.
- Market demands create an impetus for a new relationship between farmers and private suppliers of goods and services.
- New perspectives are needed regarding public funding and private actors.
- Pluralism and decentralized activities require coordination and dialogue between actors.

With regard to agricultural research and its link to extension, the recommendations are as follows: extension messages should be based on research conducted in the agro-climatic zone for which they

are intended. This obviously implies the location of research stations in all agro-climatic zones. Even recommendations emerging from such research stations and meant for the specific agro-climatic zone, will require further adaptation to suit varying local field conditions. This is particularly true of recommendations for improved soil management, watershed management, fertilizer application, etc. Research trials near farmers' fields should simulate what takes place on the fields. This entails more emphasis on factors other than technological ones, such as farmers' resource endowments, risk situations, sociological realities and the combined effect of these on farmers' adoption of recommended practices. It calls for increased awareness of the importance of the farming systems approach, particularly at the zonal level and below. However, even changing the current emphasis on the cultivation of single crops and drawing more attention to research on growing a combination of crops, is not easily achieved and requires a number of organizational changes. Research on farming systems is even more difficult to make operational and calls for a high degree of expertise at local research stations. Above all, an effective extension system is needed that is capable of diagnosing field problems and transmitting them to the research establishment. Cernea et al. (1985) recommends the following:

- Agricultural extension requires effective organization and management tailored to suit specific situations.
- Agricultural extension requires site-specific methodologies and suitable technologies.
- Agricultural extension must be relevant and responsive.
- Farmer participation is fundamental for sustainable extension.

It is easy to define the broad recommendations for institutional change that is needed to reform agricultural extension to meet the changing demands. From this review, it is obvious that current prescriptions include decentralization, pluralism, privatization, cost recovery and involvement of farmers as a key player. History and recent developments around the world illustrates that it must be driven by learning about what works and what does not, and by the nature of local circumstances and context. An analogous approach proposed by the Consultative Group on International Agricultural Research (CGIAR) is known as the institutional learning and change initiative, which is trying to adopt agricultural research to address recent challenges and improve its effectiveness (CGIAR: www.cgiar.org/impact/global/index.html). These types of approaches stem from the realization that improving the performance and capacity of a system concerns reflection, learning and incremental changes. If extension policy is to pursue such an approach, what practical steps could CA republics take?

- A first step would be to undertake a deep institutional analysis of historical and current experiences of implementing different extension approaches. This should focus on successes and failures and should be undertaken in a constructive manner to devise ways by which these approaches could be modified, bottlenecks removed and institutional arrangements amended. It was obvious during this study that there are very limited studies and analysis of the extension sector, and these are usually not used in extension policy development and planning. This approach, of course, will require a capacity development of local expertise for analyzing complex systems such as extension, which is lacking at the country and sub-country level. Without this capacity countries will remain dependent on international experts to suggest country strategies, models and blueprints.
- The next step is to set up pilot projects as experiments in agricultural extension (which already started in Tajikistan and Kyrgyzstan, and to some extent in Uzbekistan with donor assistance). While this is not new, such experiments should be coupled with local capacities and institutions (research, state, education, farmer organizations and local NGOs), and they should be involved

from the beginning to draw principles of promoting innovation in rural areas. The initiative can then be replicated with some location-specific modifications. While all these are in the process, the wider discussion of the policy framework and strategies (a few recommendations and examples of which are stated above) can be initiated in parallel, but what is most important is the interest from the state because the government should be the initiator of these reforms.

- Realizing the fact that technical and financial support from the government is a key factor for sustainability of agricultural extension services, it is recommended that associated departments of the Ministry of Agriculture or other relevant state agencies should be the main actor to play the role of agricultural extension service provider in CA. This is important for the sustainability and continuity, but the state should be the reform carrier to decentralize the extension.
- Any external assistance should strengthen the institutional capacity of the state agricultural departments by assisting in developing working relations with all the relevant state organizations (research institutes, academia, state water departments (in our case they are *oblvodkhoz*es), BISAs, BWMOs with its coupled district-level subordination units, input dealers, banks, etc.); development projects (funded through the EU, WB, ADB, SDC, UNDP); NGOs that are supported by the agricultural projects and have relevant advisory experience (UDFB, ZarZamin, CECI and ACTED in Tajikistan; RAS, ATC, Jer-Azigi in Kyrgyzstan; and Association of Private Farms in Uzbekistan); producers; and private companies that are involved in agricultural extension.
- The consolidation activities should facilitate the cooperation between the organizations mentioned through consensus building, bridging and dialogue roundtables to develop single strategy on agricultural extension while the major, leading and coordinating role should be given to the state agroproms.
- The initiatives to support extension should facilitate and assist Agricultural Departments to establish working and effective linkages with local National Agricultural Research and Extension Systems (NARES) for long-term and sustainable cooperation. The programs to assist agricultural extension should develop and transfer recommendations on better ways, approaches and methodology (specifics) for provision of extension services to farmers with regard to on-farm water management through adult training, Participatory Rural Appraisal/Assessment (PRA) methods, needs assessment, and how to monitor and evaluate extension activities.
- The support programs should facilitate the good working relations and policy uptake of results at a higher level – the MoA through the Agriculture Department for wider dissemination of positive experiences of a comprehensive and sustainable system of agricultural extension by provincial agroproms in the case of the Sogd Province.
- The support program should assist and call other players active in developing and supporting agricultural extension to provide innovative capacity and approaches, which should lead the way for farmer participation in diagnosis, testing and dissemination of new knowledge and technologies.
- Any state and external joint initiatives to establish extension should participate and support other initiatives to establish national level umbrella institutions or systems (these projects are SENAS in Tajikistan and Policy Support Project by KSAP in Kyrgyzstan), with an appropriate policy framework, sustainability issues (cost recovery) and the possible (new) roles of state agroprom systems (coordination) should be discussed with the appropriate ministries (or relevant departments) and initiating parties based on project experience.

CONCLUSION

This study reviews the existing agricultural extension systems in three countries in CA, i.e., Tajikistan, Kyrgyzstan and Uzbekistan. The study shows that after the disintegration of the Soviet Union, agricultural extension services in these three countries have been destroyed completely, resulting in a decline in agricultural productivity. This is especially true for small farmers who cannot afford to hire the services of expensive private extension advisory companies. As most of the newly emerging farmers are ignorant of farming practices and crop production mechanisms, there is an urgent need to establish formal extension systems in CA in order to ensure future food security.

The fragmented efforts of establishing extension services by internationally funded projects are filling the gap to some extent but are not sufficient for all farmers in the area. This is because these efforts are restricted to specific areas and usually have specific objectives due to their financial limitations. The extension services provided by KSAP, RAS and ATC (ZOKI) initiatives by WB and SDC, the SENAS program by EU to streamline fragmented extension in Tajikistan and WB's Rural Enterprise Support Project (RESP) in Uzbekistan are doing a reasonably good job. However, these services need to be coordinated with the state-owned extension service organizations.

The analysis of current organizational structures showed that all three countries have the necessary institutions, such as the association of farmers in Tajikistan and Uzbekistan or agricultural research and education coordination departments in Kyrgyzstan, Tajikistan and Uzbekistan. Any new initiatives to establish formal extension systems should be revitalized within the existing institutional framework and should be based on existing structures. For this purpose, existing institutes should be further strengthened, reformed and their roles should be redefined. Creation of new institutions will be complex as they will need much more capital and effort to ensure long-term sustainability. To ensure ownership, the state should play the role of mediator and facilitator for the proposed changes. These reforms should integrate the ongoing processes of social, political and economic changes in the countries in CA.

This study reveals that countries in CA have no national policy framework for the development of agricultural extension services, which could ensure the political and financial commitment of the government and other stakeholders. Unless appropriate national extension systems are established in CA through institutional reforms, backed by national policies outlined within the context of comparative agricultural advantage of different countries within the region, these countries would not be able to exploit their full potential in agriculture (Qamar 2002; KasWag AgriConsulting Worldwide 2008; EBRD 2008; Nazarov 2008).

To have effective extension in place, a national policy framework is a fundamental concern, since it should indicate national agricultural development priorities, outline the organizational structures necessary to implement these priorities and the corresponding institutional linkages, and the extent and nature of the commitment to encourage farmers to act in a manner supportive of national policy.

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