

Conservation of fruit tree diversity in Central Asia: Policy options and challenges

*Edited by Isabel Lapeña, Muhabbat Turdieva, Isabel López Noriega
and Wagdi George Ayad*



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**Conservation of fruit tree diversity
in Central Asia:
An analysis of policy options
and challenges**

*Lapeña Isabel, Turdieva Muhabbat
and López Noriega Isabel*

Introduction

The five independent republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan cover a vast territory in Central Asia, almost 4 million hectares, which is just a little smaller than the whole of Western Europe. Very different ecoregions are represented in this territory: grassland plains (steppes), riparian forests (tugai), boreal forests (taiga), wetlands, snowfields and deserts. The variety of ecosystems in these countries contributes to the unique and extremely valuable diversity of local horticultural and fruit crops.

The region has a population of approximately 60 million people, of which about 60% live in rural areas. Agriculture contributes about 30% of the region's economy and gives employment to between 40% and 70% of the population. Wheat and cotton are the major agricultural commodities. The region has a vast area of rangelands (260 million hectares) much of which is used for livestock production. Arable land, on the other hand, is quite limited, particularly in the mountainous countries of Kyrgyzstan and Tajikistan and in the densely populated regions of Uzbekistan (Samarkand and Khorezm Provinces and the Fergana Valley). Because of its importance, agriculture is a major user of natural resources, particularly water. Irrigation is extremely wasteful because the distribution infrastructure is old and poorly maintained. Soil erosion and salinization are the most important challenges for agriculture production.

Central Asia is one of the most important centres of origin for temperate fruit species, and enjoys very rich specific and intraspecific diversity of fruit trees. Apple (*Malus* spp.), apricot (*Prunus armeniaca*), peach (*Prunus persica*), pear (*Pyrus communis*), plum (*Prunus domestica*), grape (*Vitis vinifera*), almond (*Prunus amygdalus*), pistachio (*Pistacia vera*), pomegranate (*Punica granatum*), and fig (*Ficus carica*) are among the best known crops cultivated in the region, where the diverse and extreme natural and climatic conditions have helped farmers produce varieties adaptable to drought and resistant to a number of environmental stress factors.

For millennia, farmers have benefited from the natural crossing between crops and their wild relatives, breeding beneficial traits into the crops to enable them to successfully counter environmental changes so reducing crop vulnerability on farm. Contemporary breeders are increasingly searching the gene pool of crop relatives worldwide for desirable traits. This results in Central Asia being of critical importance, since it is home to extensive forests containing wild relatives of many fruit species including apple (*Malus* spp.), pear (*Pyrus* spp.), plum (*Prunus* spp.), almond (*Amygdalus* spp.), pomegranate (*Punica granatum*) and grape (*Vitis* sp.). The management of crop diversity by traditional farmers to cope with biotic and abiotic stresses and to produce fruit varieties with palatable traits has resulted in a wide range of genetically different varieties of these species. Both farmers' traditional varieties (or 'landraces') and wild relatives serve as the world's repositories of fruit tree genetic diversity and represent a vital source of genes that can ensure current and future food security.

Not only do Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan share a common wealth of genetic reserves of wild fruit species, they also share similar traditional farming systems and the same recent historical, economic and political legacy. These countries are rooted in a similar legislative framework regarding land reforms and cropping patterns, with implications for the conservation of agricultural biodiversity. Major changes in rural economies, after the break-up of the former Soviet Union in 1991, have contributed to exacerbating some of the threats to such agricultural diversity.

From 2005 to 2010, the United Nations Environment Programme (UNEP) with the Global Environmental Fund (GEF) supported a project coordinated by Bioversity International, whose aim was to understand “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*”. The project analyzed existent legislation and policies in the five republics to identify gaps and provide options to policymakers for strengthening legal and policy frameworks that support the conservation of horticultural and wild fruit species genetic diversity.

The Central Asian countries focused their study on legislation and policies related to three thematic areas: 1) enhancing conservation of crop wild relatives, 2) supporting farmers’ management of local diversity of fruit species for their conservation and continued evolution *in situ*, and 3) recognizing and protecting farmers’ rights. For this purpose, national partners reviewed existing legislation on protected areas, forest management, endangered species, land reform and farm development, among other issues that critically affect *in situ* and on farm conservation. Partners’ reviews resulted in reports which summarized the content of existing legal frameworks and pointed out gaps with regard to the conservation of fruit crop diversity. Having identified existing gaps, policy and legislation proposals were elaborated. As a consequence, actors at all levels have gained a better understanding of the importance of traditional, diversity-based agricultural systems, and more recognition has been given to farmers and communities regarding *in situ* and on farm agricultural biodiversity conservation.

The results of the project evidence that the conservation and sustainable use of wild relatives and landraces in Central Asia must rely on different and complementary approaches. Policy measures that can be adopted range from the classic protection of ecosystems using the designation of natural protected areas where certain human activities are forbidden, monitored and penalized, to supportive schemes that provide incentives for farmers to conserve and sustainably use wild relatives and landraces.

In this introduction, we first summarize the factors that threaten local diversity of fruit and horticultural crops in the five countries concerned, including both wild species and landraces. And then we outline the measures that can be adopted to develop and implement policy and legislative frameworks that better serve conservation goals. We present policy actions that have been proposed in the context of the project, several of which are currently being tested.

Policy options for the conservation of wild fruit species in Central Asia

Threats to the diversity of wild fruit species

Historically, the protection of wild fruit species in Central Asian countries has taken place through the development of laws and regulations on forest and habitat conservation. Ancient nut and fruit forests are home to ancestors of domestic fruit crops and are important reserves of wild genetic diversity. This type of forest is concentrated mainly in mountain areas, which are the areas where forest degradation is most severe. During the last few decades, loss of fruit and nut forests has been conspicuous, with rates that indicate that they have been diminished to half their original size. The impact of forest degradation on tree species is evidenced by the Red List of Endangered Trees in Central Asia, which includes 44 threatened tree species, many of them wild relatives of globally important fruit crops (Eastwood *et al.* 2009: 9).

Various factors have contributed to such loss. In the first place, local populations in Central Asia are heavily dependent on forests, which provide them with firewood, timber and food (nuts, fruit, mushrooms and honey). They use wild fruit and nut species as food, but also for their medicinal properties, in handicrafts and to dye handmade products.

The reliance on nut and fruit forests increased during the transition period towards a market economy after the break-up of the former Soviet Union in 1991 due to the economic decline and poverty suffered by rural communities. During this period, the harvesting of berries, fruits and nuts from forests increased considerably, both for subsistence purposes, and for national and international trade with, for example, China and Turkey (Eastwood *et al.* 2009). The informal sector dominates the collection and trade of fruits and nuts from the wild. People are allowed to collect them freely in most of the countries, and only in some exceptional cases is the payment of a fee required. This informality deepens the current overexploitation of natural resources.

Although logging is illegal in the majority of the indigenous forests in Central Asia, rural communities have traditionally cut down trees for various uses, including firewood and construction. The use of wood for burning has been affected by an increased demand on the part of local populations. Except in Turkmenistan (which has immense natural gas reserves that the government distributes for free or at low prices), wood fuel is still important for a large proportion of the populations that live in rural areas and do not have access to fossil fuels. In Tajikistan, for example, more than 80% of rural households rely on wood fuel as their main source of cooking energy (FAO 2006: 38).

Uncontrolled grazing has also been identified as an important threat to the region's unique fruit and nut forests. This problem has been intensified since independence with

the conversion from collective farming of cattle to private ownership. In Turkmenistan, for example, it is estimated that pistachio forests, which are the second largest type of forest in the country (with 78,000 ha), have suffered deforestation largely because of improper cattle grazing, which impedes the regeneration of the wild fruit trees.

Other factors threatening forests and their indigenous biodiversity are fires, expansion of settlements and agriculture, collection of rootstocks for grafting and the spread of invasive species from country houses (*dachas*). In Tajikistan, for example, there are around 2,375 alien flora species. (United Nations 2004: 121).

All these factors have had a great impact on forest diversity in Central Asia. For example, in Uzbekistan, Nikolai *et al.* indicate in the national report that in one sole decade (1991-1999), the number of rare and disappearing species doubled.

The situation is exacerbated by the lack of institutional capacity to protect forests and regulate their management effectively. As pointed out by reports from each country involved in the project, the most important deficiencies regarding the protection of wild fruit species are: decision-makers' lack of understanding of the role of crop wild relatives in agricultural development, and of their economic importance *per se*; failure to include wild fruit species in the state lists of valuable species that require special conservation; lack of information and inventories; low awareness among local populations about the importance and value of these species for the development of horticulture; poor scientific understanding of the problems affecting wild fruit species conservation; and inexistent financial support for this important goal.

Specialty protected natural areas for wild fruit species: Recent advances and challenges

Current approaches to forest management in the region are rooted in the Soviet system, which means that most of the forests were primarily designated for conservation purposes rather than for exploitation activities. During the Soviet period, Central Asian countries were supplied with wood from Siberia and other parts from the central and northern parts of the former Soviet Union. Commercial logging is still prohibited and forest management is primarily focused on provision of environmental services (e.g. protection of watersheds), recreation and wildlife management (FAO 2006: 13). Accordingly, project countries have focused their interventions on gradually expanding natural reserves over forest areas where fruit and nut trees grow.

Protected areas located in centres of crop diversity are especially valuable for conserving crop diversity. Although it is only recently that they have been used for the protection of landraces and wild relatives, protected areas have been found to counteract habitat fragmentation caused by agricultural intensification (Stolton *et al.* 2006). Thus, as the expansion and intensification of agriculture reduces opportunities for fruit wild relatives to survive in the broader landscape, the role of protected areas gains importance.

In the five countries of Central Asia, there has been a great expansion of protected territories since independence, reaching four to six percent of their total land area. The system of protected areas has been largely inherited from the former Soviet system. There are three most important protected area types in Central Asia: *zapovednik* reserves (strictly protected reserves), national nature parks, and *zakazniks* (sanctuaries or special purpose reserves). The highest level of protection is granted to the *zapovedniks*, or strictly protected national reserves (IUCN Category I), which are set aside to preserve ecosystems and their representative fauna and flora; only scientific research is allowed. National nature parks (IUCN Category II) are established in order to protect natural objects and complexes of ecological, cultural and aesthetic importance and use them for conservation, recreation, scientific or cultural purposes. They have differentiated regimes of protection and land use, which is provided by dividing the reserve territory into functional zones. The *zakazniks* or special purpose reserves and natural monuments (IUCN Category III) allow for a much greater variety of land use, including agriculture. In all cases, the protection applies to habitats and plant communities, rather than certain plant species. In recent years, most countries in Central Asia have adapted their protected area systems to the IUCN categories and have incorporated new instruments of protection such as buffer zones and transboundary natural protected areas, which have helped harmonize them with international regulations.

Networks of protected areas with different protection levels have been established to conserve the natural habitats of distinct fruit and nut forests, especially those under threat:

- In Kazakhstan, four state nature reserves with approximately 594,000 ha that belong to IUCN Category I, 348,756 ha assigned to national parks (IUCN Category II) and 200,000 ha belonging to IUCN Category III are the home of important apple and apricot forests.
- Great attention has been paid to walnut forests in Kyrgyzstan, which are considered to be the largest remaining areas of this particular forest type worldwide. They have received protection, together with a large range of fruit trees and wild species (e.g. pistachio, sea-buckthorn, pear, grapevine, cherry) within nine state nature reserves, seven national parks, state forests and botanical wildlife reserves, which comprise about 412,132 ha belonging to IUCN Category I; 235,646 ha to IUCN Category II and 41,341 ha to Category III.
- In Tajikistan, the Tajik National Natural Park covers 2.5 million ha of protected habitats where peach, sweet cherry, walnut, hawthorn and sour cherry grow. In this country, a total of 82,548 ha belonging to IUCN Category I, 2,503,000 ha to Category II and 459,325 ha to Category III are protected territories of relevance for the protection of wild fruit and nut species.
- Turkmenistan has eight state nature reserves or *zapovedniks* with about 785,424 ha as well as 976,646 ha of wildlife reserves that are the home to the country's important pistachio forests and of apple, walnut, Turcoman pear (*Pyrus turcomanica*), and Afghan fig (*Ficus afghanistanica*), among others.

- Uzbekistan has six state reserves that belong to IUCN Category I, with approximately 192,000 ha, and 2,400 ha that come under IUCN Category II for the conservation of Bukhara almond (*Agmygdalus bucharica*), Sievers apple (*Malus sieversii*), hawthorn, pistachio and walnut, among others.

Countries have also established UNESCO Biosphere Reserves which aim to conserve cultural values and traditional farming systems and ensure that certain landraces continue to be valuable for local communities. Some examples are: Sary Chelek Biosphere Reserve (23,868 ha) in Kyrgyzstan, Mount Chatkal Biosphere Reserve (35,255 ha) in Uzbekistan and the Repetek State Biosphere Reserve (34,600 ha) in Turkmenistan.

In general, countries have made efforts to consolidate national legal frameworks by gradually adjusting laws adopted during the Soviet Union, developing new strategies for the conservation and use of biodiversity and ratifying multilateral environmental conventions. However, there is a wide gap between the drafting of laws and their enforcement, due to a lack of regulations that translate the laws into concrete mandates and responsibilities and mainstream their implementation into other sectors outside the environmental sector. This situation is accompanied by a lack of monitoring and liability regimes.

Additionally, contradictions and gaps in existing environment and forest regulatory provisions and lack of institutional coordination create conflicts at different scales: among different levels of government, and between village dwellers and local authorities. Mandates and responsibilities for natural reserves are scattered across ministries, agencies and committees of nature conservation, forestry, fish and game, thereby diminishing the efficiency of scarce human and financial resources. At the same time, it is the central government which confers protected area status, but local authorities which are responsible for their management; the sharing of competencies between the two levels of government remains unclear.

In some countries, like Kazakhstan, as part of their responsibilities in land use planning, local executive agencies play an important role in identifying land plots for the establishment or expansion of protected areas of national significance. However, this role is negatively affected by a lack of integrity, competence and appropriate procedures.

In their Land Codes¹, countries have included territories that are subject to special protection in the list of state property sites not subject to privatization. Most forests are public lands and part of state reserves. However, forest management is being privatized. Forest land is leased to private enterprises and timber management is put in private hands. This practice often runs against environmental objectives.

¹ Land Codes refer to a main piece of legislation that comprehensively regulates land tenure and ownership within a country.

A lack of funding remains the main constraint to more successful implementation of environmental protection strategies. Most of the time, conservation laws in Central Asia follow a top-down design with government-managed protected areas and minimal participation by forest dwellers or rural communities. This command-and-control approach has proved to be inadequate when the state directs limited resources to monitoring and controlling the conservation of the sites.

Their very presence in a protected area affords some degree of protection – albeit fortuitous – to wild fruit crops, but only if the area is effectively managed and conserved. Conservation of wild fruit crops in Central Asian countries requires a major transformation from hands-off or passive protection to active conservation, in which positive actions promote the maintenance of the natural ecosystems that contain targeted taxa.

Current national proposals aimed at ameliorating wild fruit species conservation in the future entail the declaration of new protected areas, the extension of existing ones, and the upgrading of existent areas to more stringent protection categories accompanied by further restriction of human activities. However, most protected areas have not been set up with conservation of particular species in mind and the fortuitous presence of certain species in a protected area is not sufficient to constitute an adequate conservation plan. In this respect, country reports agree that the role of protected areas in conserving fruit crop genetic diversity could be greatly increased by creating genetic reserves within these areas to protect target species; a better understanding of the issue within institutions in charge of protected areas management; wild fruit crop relative specific management plans; and the creation of inventories that would allow monitoring of the genetic variability and genetic erosion of the species concerned.

Future actions for the conservation of crop wild relatives and landraces should include the development of national strategies. This implies evaluating current protected areas in terms of how they conserve crop genetic diversity and in terms of the need to expand and strengthen networks of protected areas. Strategies for the conservation of certain genetic reserves outside the limits of specially protected territories are also critical for fruit and nut genetic conservation. Inventories of biosphere reserves and other protected areas are also important to determine which wild relatives and fruit species are already included in protected spaces. In Kyrgyzstan, the *State Cadastre of Specially Protected Natural Areas*, created through the recently approved 2011 *Law on Specially Protected Areas*, goes in this direction.

Policies are required to ensure that local communities are adequately motivated through incentives and benefits to secure the successful conservation of resources in conservation sites. As an example, engagement of local communities in forest management, particularly to confront the problem of overgrazing, can be achieved through agreements with flock owners on grazing rights, stocking levels, and grazing periods with respect to forests and forest lands (Babu and Tashmatov 2000: 79).

These kinds of alliances become crucial in areas outside protected areas which house unique varieties of wild relatives and threatened species and where anthropogenic pressure is very high.

The GEF project “*In situ*/On farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia” contributed to identifying wild fruit species biodiversity as a priority for conservation policies. In some countries, such priority has translated into the expansion of certain protected areas to protect fruit genetic diversity and in the identification of places outside protected areas where local communities play a major role in maintaining genetic material of agricultural value. In this sense, a proposal has been presented to the *Oliy Majlis* (Parliament) in Uzbekistan that foresees the extension of the coverage of a number of protected area territories and the creation of three new nature reserves of importance for the conservation of wild fruit crops. In Kyrgyzstan a proposal has been elaborated to create the state natural parks of Khan-Tengri, Sary Zhaz, Avletim Ata and Alay, with an area of 609,900 ha in total, where wild fruit species such as sea-buckthorn, walnut, currant, apple and cherry plum, among others, will be protected. A proposal to establish protected areas for the conservation of wild fruit species, including a national natural park Tarbagatai (100,000 ha), has also been elaborated in Kazakhstan.

The project has also contributed to the completion of proposals that seek to integrate genetic diversity conservation in forest management practices regulated by national forest codes, in particular in relation to nut and fruit forest genetic resources. This is the case of the contributions to the new edition of the *Forest Code of Turkmenistan*, the proposals made to the *Concept of Forestry Development in Uzbekistan until 2030* and the draft of the new *Forest Code of the Republic of Uzbekistan*. The Uzbekistan proposal emphasizes that particular attention should be paid to the conservation of biodiversity in the State Forestry Reserve, so that no logging is allowed if it adversely affects the wild relatives of cultivated plants such as walnut and pistachio or threatened species. Accordingly, future research should concentrate on wild fruit species located in forest reserve territories, to assess their situation and prepare proposals for the designation of protected areas. To this end, more expert scientific engagement in natural reserve management is considered necessary.

Crop wild relatives in the national lists of most valuable and endangered species

Most of the five Central Asian countries do not have fully developed legislation on the conservation and use of flora and fail to accurately determine the protection of individual species. In brief, there is no specific legal recognition of particular wild fruit species requiring conservation. The main efforts for protection of fruit and nut trees have been channelled through general *Lists of High Value Tree and Shrub Species* that are included within *Forest Codes*. This instrument grants special conservation status to species categorized as “valuable” so that they may not be subject to felling.

Information on the status of fruit and nut tree species and their genetic diversity is still inadequate. While some formal knowledge on resources exists, it is outdated and dispersed. An integrated approach among key stakeholders (scientific institutes, government agencies, forest dwellers and farmers) is required for more effective interventions to conserve fruit and nut species.

Emerging conservation actions in this area include the adoption and development of laws and regulations on flora that help to create a framework for plant diversity conservation. Furthermore, the need for unified biodiversity data and inventories of crop wild relatives that can serve as a baseline for action is being stressed by countries as a main line of action. It is important to gain knowledge about the location and status of these species through inventories and maps to provide critical baseline data for fruit crop wild relative conservation and planning. Other proposals refer to the diagnostic of rare and endangered plant species, plant communities and ecological systems, the criteria and procedures to define such status, and the control and regulation of alien species.

The project has contributed proposals for strengthening the protection of wild fruit forest species in the draft laws *On Flora* in Kazakhstan and Turkmenistan and the elaboration of a draft *On Conservation of Genetic Resources of Cultivated Plants and Their Sustainable Use* to the Parliament of Tajikistan. Additionally, a proposal is being made to update and include new species, such as Kyrgyz apple, Sogdian cherry plum (*Prunus sodgiana*) and sea-buckthorn (*Hippophae* L.), in the *List of High Value Tree and Shrub Species* of Kyrgyzstan. With the same objective, Uzbekistan has developed the *List of High Value Tree Species* with the addition of ancestors of many cultivated varieties to be included in the new *Forest Code*, which includes wild apple, pear, apricot, almond, walnut, grapevine, pomegranate, pistachio, fig, cherry plum and hawthorn (*Crataegus*).

All five countries have adopted lists of endangered species to receive special attention in establishing priority systems for conservation. In most cases, there exists an overlap between the former, national *Red Data Books*, which were state documents established in the former Soviet Republics for documenting rare and endangered species, and subsequent *IUCN Red Lists*, the latter normally being stricter. As a general rule, these kinds of instruments support conservation only when they are accompanied by action plans for the recovery of the species, and when they are continuously updated. Community involvement is essential in the conservation and management of threatened species which are of economic and social value, such as fruit and nut species or medicinal plants.

In Kyrgyzstan, the *Red Data Book* includes nine fruit species. There are several initiatives for the restoration of nut-tree forests in the Jalal Abad region and, to this end, the recognition of usufruct rights and community management of forestry species. In this country, specific restoration policies, such as a 5-year moratorium imposed on walnut wood logging, have had a perverse, indirect impact on the felling of undergrowth

trees (apple, cherry plum, maple and other associated species of the second and third forest layers), which have been cut down by local populations for fuel. This situation is being addressed by the new *National Action Plan for the Development of Forest Ecosystems for 2011-2014*. Tajikistan too has developed a specific *State Programme on Medicinal Plants for the Period 2005-2014* that promotes a rational use of wild flora, and a programme on restoration and the further development of horticulture and viticulture, for 2005-2010.

Countries have liability regimes in relation to overexploitation of threatened species, illegal poaching and violation of rules for the protection of flora, illegal felling of trees and bushes, and destruction or damage of forests and protected areas. Kazakhstan already expressly includes this type of conduct in the *Criminal Code* of 1997. Tajikistan modified the *Forest Code* in 2008 to include liability in relation to violations of forestry legislation. The Turkmenistan *Criminal Code* of 1997 provides a list of penalties for illegal exploitation of flora and Uzbekistan includes administrative and criminal liability in the case of damage to flora in natural protected areas under the 2004 *Law on Protected Natural Areas*.

Emerging actions as a result of the project include Tajikistan's proposals to the Committee for Rare and Endangered Animal and Plant Species to include wild species of grapes, pomegranate and cherry plum in the second edition of the *Red Data Book*. In addition, recognition of the genetic erosion of wild apple and apricot populations has led to species restoration programmes of Sievers apple (*Malus sieversii*) and the apricot in Kazakhstan.

A common feature in conservation policies is the need to raise awareness among decision-makers and other stakeholders about the importance of agricultural biodiversity. This calls for greater efforts to create awareness among stakeholders of the concept and importance of *in situ* conservation of wild species of economic value and of their great relevance for local food security.

Agricultural policy changes and their impact on fruit crop diversity

Threats to local diversity of fruit and horticultural crops

A distinctive characteristic of Central Asian countries is that, as centres of origin with a high diversity of temperate fruit species, there is no exact demarcation between wild and cultivated species. Traditions of fruit selection and cultivation in garden plots go back millennia in Central Asian countries and are closely linked to ethnic and cultural identification. In Tajikistan, for example, most of the cultivated forms and varieties of

fruit trees are derived from about 30% of wild species (e.g. walnut and pistachio have been cultivated following long-time use of their wild forms; selection of the best forms among wild populations of wild pear in the Pamir region allowed them to be grown on small farms).

Horticulture and viticulture play an important role in providing rural populations with food and well-being. The diversity of local fruits is a source of tolerance and resistance to diseases, pests, cold and drought, functioning as a safety net for farmers under extreme environmental conditions. However, recent uprooting of ancient orchards of apricot, apple, pear, sweet cherry, mulberry, as well as grape vines, bred over many centuries of traditional selection, has led to a significant loss of genetic resources of fruit crops.

During Soviet times, much of the area dedicated to fruit crops had to be abandoned to make way for cotton production. New, difficult socio-economic conditions emerged during the transition to a market economy and a lack of know-how concerning orchard management was common in the turnaround of the status of rural populations from state-owned-farm labourers to independent farmers. This situation increased the abandonment of areas where fruit crops were cultivated. Orchards and vineyards that had been under state nursery supervision during the Soviet era became highly degraded because of weak capacity for maintenance by individual farmers. The same process took place with fruit orchards in households, due to a great deficit of energy and a lack of financial resources for purchasing agricultural inputs such as fertilizers and pesticides.

More recently, under the new conditions of the market economy, traditional, diversity-based systems are being substituted by modern cultivars and hybrid varieties, partly due to state policies that privilege modernization of agricultural production and promote the cultivation of a few crops demanded by the market. Farmers are losing interest in maintaining genetically-diverse traditional varieties and fewer farmers are cultivating landraces. This erodes the genetic base and puts at risk food security at the local level. Additionally, increasing migration to cities hinders the transmission of traditional knowledge between generations and decreases the labour available for orchard management. Common problems associated with modern varieties are that they are poorly adapted to local conditions, that their performance relies on the use of additional production inputs, and that disease-free planting material is insufficiently available. Dramatic climate changes highlight the need to avoid overdependence on modern varieties and to broaden the genetic base of fruit and horticultural crops for better adaptation to environmental changes in Central Asia.

In line with this, national experts are calling for urgent measures for an increased presence of local varieties in national markets. The Uzbek Research Institute of Plant Industry notes that local varieties dominated the range of fruit crops found across the country several years ago, but by 2004, local varieties represented only 5% of apple varieties, 12% of pear, 14% of sweet cherry, 38% of grapevine and 50% of apricot

(Uzbekistan Country Report on the *State of Plant Genetic Resources for Food and Agriculture* 2004).

On farm fruit genetic resource conservation is impossible without local communities' or farmers' involvement. Farmers' decisions on what to conserve and exploit cannot be understood outside the social and economic context where they are adopted. In this scenario, farmers' preferred options with regard to plant diversity can easily conflict with top-down policy decisions and regulations that do not build upon farmers' socio-economic circumstances and do not support their capacity to access and employ diversity on their lands. Issues related to land tenure, availability of planting material, freedom to farm, farmers' management capacities, and local institutions and markets for diversity-rich products need to be taken into consideration when designing policy interventions oriented towards on farm conservation and the management of plant diversity on farm.

The dramatic changes that have taken place in the five republics' agricultural production systems during the last decades have greatly influenced individual farmers' freedom and capacity to cultivate different types of crops and varieties, particularly those changes related to: 1) land tenure schemes; 2) policies on support to preferential crops; and 3) public agricultural research. In the following section, we will analyze how these elements have contributed to creating new opportunities and challenges for the conservation and expansion of fruit crop diversity in the five countries.

Land reform

After independence in the 1990s, the five Central Asian countries, which became members of the Commonwealth of Independent States (CIS)², underwent a series of transitions from centrally planned economies to market-oriented systems. In general, agricultural reforms shifted to a focus on property rights reform, the individualization of agricultural production and the creation of adequate market institutions. The agricultural policy reforms have not progressed equally in the five countries, each of which has pursued different degrees and types of reforms. While Kazakhstan and Kyrgyzstan pursued liberalization policies designed to transform their systems of production, Tajikistan, Turkmenistan and Uzbekistan have maintained their centralized structures with gradual changes responding to national food security needs and to international markets.

During the Soviet era, a dual farming structure characterized the agricultural production system, where collective state farms coexisted with small household plots and *dacha*

² The Commonwealth of Independent States (CIS) was created in December 1991. At present the CIS unites Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and Ukraine.

gardens. Collective state farms were taxed by the state procurement systems and subsidized through pricing of inputs, and at the same time were in charge of providing social services in the rural areas. They produced most commercially traded output, while household plots were largely subsistence-oriented and sold only the surplus output that remained after satisfying the family's need for food (Spoor 2007).

After the 1990s, the process of individualization of land tenure took place to the detriment of state collective farms. Individualization of land tenure does not equate to privatization of land ownership. Kazakhstan and Kyrgyzstan are the only countries that recognize private ownership of agricultural land³; while in Tajikistan and Uzbekistan all land remains state-owned and it is transferred to farmers in the form of use rights, normally on a long-term basis (e.g. 30 to 50-year contracts in Uzbekistan). Turkmenistan recognizes private property, but virtually all land is owned by the state and given to farmers in the form of use rights.

Land reform is still in transition in the Central Asian countries and continues to transform agriculture. The agricultural landscape is still defined by the old classification into corporate and individual farms; but now the individual sector includes two distinct components: the traditional household plots or *dacha* gardens carried over from the Soviet period and the new emergent peasant farms (Lerman and Sedik 2009c).

Individualization of land has resulted in a substantial enlargement of household plots through additional land allocation⁴ and the emergence of a new legal organizational form named *dekhkan* and *fermer* enterprises in Tajikistan and Uzbekistan; *daykan* enterprises in Turkmenistan and *krestyan* enterprises in Kazakhstan and Kyrgyzstan, which all are generally referred as *dekhkan* enterprises or peasant (farming) enterprises, which are created as independent entities outside the existing collectivist framework. These *dekhkan* enterprises have legal status, are larger than household plots and have a more clear commercial orientation.

This restructuring of land has resulted in agricultural production being shared by different types of production units in the five countries. In Tajikistan (with a 74% rural population), the agricultural sector comprises a total of 30,000 farmer households, 14 *dekhkan* farms, 18 state farms and 2,578 other forms of agricultural enterprises. The size of *dekhkan* farms ranges from 0.5 to 50 ha of irrigated land and 100-200 ha in non-irrigated lands (Bobodzhanova 2012, in Alpas *et al.* 2012). In Turkmenistan, the organization of *daykan* property is done through 497 *daykan* associations where 83% of irrigated lands have been distributed among 395,700 renters. In Uzbekistan, the 319,200 ha that belonged

3 In Kyrgyzstan, the right to acquire land is subject to being a resident in the rural area for at least two years. In Kazakhstan farmers have the choice of buying land from the state or renting it under a long-term (49-year) or a short-term (5-year) lease. The problem here is that the land market has reached high prices that farmers cannot afford.

4 In Tajikistan, household plots reached a 5.8% share of total agricultural land in the year 2007, from only 1% during the Soviet period, showing the significant increase in arable land family holdings (Lerman and Sedik 2008).

to 219 cooperatives specializing in fruit and vegetable agriculture and viticulture were allocated to 199 private agricultural farms in 2006. Currently 80% of the production of vegetables and fruits in Uzbekistan is under private holdings.

Another important feature has been the adoption of leasing arrangements – retaining local authority control – which can enlarge the size of household plots and *dekhkan* enterprises through the dissolution of state farms. Nowadays, in Kyrgyzstan, where almost 80% of total land is individually owned or operated, *krestyan* enterprises have nearly 20% of leased land in their total holdings and household plots lease 11% of the land they farm (Figures for 2009) (Lerman and Sedik 2009a).

Together with land reform, the five countries have gone through a process of adjusting the whole production system to the new farmer-led model. Irrigation schemes, machinery, access to credit, input supplies, storage services and marketing processes were all designed for large, corporate farming. The privatization of land was not coordinated with a corresponding privatization of machinery and other means of production. Linkages between the new farms and agricultural research stations weakened considerably due to the disappearance of most of the agricultural extension services following the Soviet collapse. This situation resulted in the new individual farmers being faced with a number of difficulties that still persist, such as a lack of adequate infrastructure and technologies, financial support and market channels. Decentralization of irrigation infrastructures and water management is a particularly urgent need in all five republics. Irrigation structures inherited from the Soviet era are still designed for large holdings and are managed centrally. They have proved to be inappropriate for reaching individual farms. Water user associations have been created to address this issue, but frequently smallholders are poorly represented in the associations' decision-making bodies (Aminova and Abdullayev 2009).

Despite these challenges, the new paradigm has contributed greatly to agricultural recovery with a remarkable impact on productivity growth. In the year 2007, individual farms contributed 88% to the Gross Agricultural Product in Central Asia, in contrast to a shrunken contribution to GAP of 12% from state enterprises (Lerman and Sedik 2009c: 6).

Changes in cropping patterns

The dismantling of central planning has entailed important changes in cropping patterns. During Soviet times, overspecialization of one “strategic crop” (i.e. cotton) was dominant in Turkmenistan, Uzbekistan and Tajikistan, and to a lesser extent in Kazakhstan and Kyrgyzstan. After the break-up of the Soviet Union, public investment followed an economic policy of self-sufficiency in grains, maintaining export potential for cotton products. Despite being one of the major suppliers of fresh and processed fruits and vegetables in Central Asia, Uzbekistan still uses 40% and 30% of its cultivated area for cotton and wheat production respectively, most of it in irrigated

areas. In Turkmenistan, 42% of the cultivated area is dedicated to cotton and 49% to wheat, in contrast with pre-Soviet times, in which melon was the primary crop in the country, with more than 400 varieties. In other countries, such as Tajikistan and Kyrgyzstan, land distribution has resulted in a more evident loss of control by the government concerning the mix of crops produced, with an important increase in the area planted with vegetables and fruit, particularly potatoes and melon, to the detriment of cotton (Lerman and Sedik 2008, 2009a).

Following the transfer of decision-making power from the state to farmers, individual farms have played an important role in diversifying agricultural production, which contributes to food security in all the republics. In Uzbekistan, for example, the harvest of melons and other fruit rose considerably during the period 1995-2006 (by 57.6% and 96.3%, respectively) (Musaev *et al.* 2010: 34).

In general, the fruit and vegetable subsector has always been the most independent agricultural sector, with its own dynamic in the open market in all the five countries. During the communist decades, when land allocation followed the privileging of wheat and cotton production⁵, home gardens were the only space that allowed farmers to exercise their autonomy, thanks to stable land tenure and ownership rights over these small plots of land. As documented in several studies, secure land tenure provides farmers with more incentives to make investments in their own land and favours natural resource conservation (Pinstrup-Andersen *et al.* 2000; Oram 2000). If farmers are not sure that they will benefit from improvements on their land in the future, they may avoid long-term investments such as crop diversification. Home gardens were crucial for overcoming poverty and economic collapse after independence⁶ (Lee *et al.* 2003).

Most farmers in the five republics own the land used for the garden, and they use it to plant different crops and varieties for their own consumption and also to increase their economic options. Home gardens, therefore, became authentic reservoirs of fruit and nut genetic diversity, centres of experimentation and innovation, the principal source of fruit and horticultural crops and essential components of livelihood strategies in the countries. In Tajikistan, for example, home gardens provide an estimated 50% of total household income. Home gardens, in some countries, represent the only land on which farmers can rely. They are still the only space where individual initiative is allowed and traditional agricultural practices and inherited varieties are maintained free from state planning (Watson and Eyzaguirre 2002). Therefore, their importance for agricultural biodiversity conservation and livelihood strategies is remarkable.

5 By the end of the Soviet era, land allocated to winter wheat production was increased almost five times, largely at the expense of areas dedicated to fruit and vegetable crops in Turkmenistan. Fruit and vegetables remain in the domain of home gardens and household plots as in the past (Adaptation Fund, 2011).

6 As an example, by the end of the Soviet era, as much as one third of food sold in markets was from home gardens in Tajikistan (Rowe, 2009).

Additional individualization of land through *dekhkan* enterprises and enlargement of household plots implied the transference of decision-making power from the state to farmers, placing farmers in a better position to explore and exploit diverse crop production. Currently, households have plots of an average area of 1 ha, which they can operate independently, selling the products in the market. Even in countries such as Tajikistan and Uzbekistan, with strong state control over cropping patterns, household plots have been kept out of state production orders, which stipulate which crops to produce, in which market to sell and at what price. In Turkmenistan, almost 100% of fruit and vegetable production is generated privately by independent farmers and leaseholders (Adaptation Fund 2011). With regard to *dekhkan* enterprises, land tenancy and use rights are secured by specific legislation, which issues a certificate in favour of the head of the *dekhkan* farm. The legislation establishes a set of rights and responsibilities through which the autonomy of the farmer is guaranteed and, in some cases, interference from authorities is expressly prohibited⁷. However, farmers' decisions on the species and varieties to be planted in *dekhkan* lands are highly influenced by government policies on preferential crops. Kazakhstan's strategy for national food security promotes the cultivation of planting materials of perennial fruit and berry plants and grapes. In 2006-2007, a total of 4,804 farm units, ranging from less than 1 ha to over 50 ha, were dedicated to perennial fruit berry plantations and vineyards. But local varieties of fruit crops are found almost exclusively in farm units that are less than 1 ha in size and are mainly dedicated to self-subsistence production. These represent 36% of the total; the remaining 64% are mostly devoted to modern certified varieties for commercial exploitation. In Kyrgyzstan, on the other hand, fruit crops are not included in governmental food security policies and therefore do not enjoy preferential treatment under subsidized seed dissemination programmes. This has influenced farmers to cultivate fruit crops in home gardens and to dedicate *dekhkan* farms to cereals, legumes and other crops more closely linked to food security at the national level. Despite this, the significance of *dekhkan* enterprises cannot be overstated with regard to conservation of local varieties in the future. In Uzbekistan, for example, *dekhkan* enterprises produced 59% of fruits and vegetables and 37% of grapes in the year 2000 (Khusanov 2000).

It could be surmised that land reform and the transformation of farming structures have influenced in a positive way farm-level decision-making regarding cropping patterns. However, a pervasive system of government interventions often prevents the freedom to farm in practice. There still exists a command-and-control institutional structure that, in some cases, directly locks farmers into a rigid cotton or wheat cropping pattern (normally on the best irrigated land), depriving them of freedom of choice on

7 For example, the Law of the Republic of Tajikistan on *Dekhkan* Farms of the year 2002 establishes: "Article 5. *Dekhkan* Farm as a Form of Economics (...). The *dekhkan* farm shall independently determine the structure and mode of production taking into consideration its own interests; it can be engaged in any kind of activity unless it is prohibited by the legislation of the Republic of Tajikistan. Organs of government shall not interfere with the economic activities of the *dekhkan* farm except on the grounds prescribed by the law".

their farms. Indirectly, the government practice of reserving access to water and other production inputs for wheat or cotton cultivation drives farmers toward a specific crop system. Consequently, after independence, competition for the different inputs and infrastructures is neither between actors (state-individual), nor dependent on the type of land ownership involved (state, household, *dekhkan*), but among different forms of production, where the crop that is being cultivated is the determinant factor (Veldwisch and Spoor 2008).

Cotton and wheat involve a form of production that has a specific, rational, economic base and socio-political importance. This creates a dividing line in resource distribution in countries such as Tajikistan, Turkmenistan and Uzbekistan. Pervasive state intervention takes place through detailed plans for cotton deliveries and acreages, the timing of sowing and harvesting and output prices. In return, it is accompanied by a supporting scheme of water quotas and subsidies for energy and fertilizers. Even with more land available for fruit production, water control does not permit farmers to take advantage of it to change their crop patterns. State water quotas are imposed in a hierarchical process created to favour farms under state production quotas for cotton, and to hamper other forms of production. In this system, small land owners who cultivate crops such as rice, vegetables and fruit are under-represented and do not even have a presence in water user associations. It should also be noted that, in some countries, as is the case in Uzbekistan, the allocation of land to rural families has taken place in a context of decreasing irrigated area per capita, leading to more displacement and a more conflictive situation.

Increased water demand because of population growth and intensified agriculture production coexists with a neglected irrigation infrastructure, unfair water allocation, land salinization and the shrinkage of the area irrigated. Smallholder water users are vulnerable as they depend on agriculture for their survival and have to compete for water allocation and irrigated land with privileged elites and favoured forms of production (Aminova and Abdullayev 2009; Thurman 2001). Water tensions arise between emerging forms of private production and state controlled production. This competition for diminishing water resources also creates and exacerbates cross-border conflicts among the five countries in Central Asia, (Kuehnast and Dudwick 2008).

National reports produced in the context of the project “*In situ/on farm Conservation and Use of Agricultural Biodiversity in Central Asia*” have underlined the impact of this situation on fruit production and, in particular, the strict correlation between water access and fruit genetic diversity. The report from Turkmenistan identifies water deficit as the main factor leading to home gardens being the main space for fruit crop cultivation (with an average of 0.2 ha) and highlights the small production areas dedicated to pomegranate, apple and watermelon plantations due to this reason. Poor and badly maintained irrigation systems and shortage of irrigation water are the main constraint on farmers’ activities for conservation of local varieties according

to Uzbekistan national experts. Rowe (2009) describes a similar state of affairs in Tajikistan⁸.

Energy, fertilizers and other input subsidies, only foreseen for cotton and wheat production, are a further, significant barrier to the development of an alternative cropping pattern. In Kazakhstan, for example, economic subsidies granted to a list of priority crops mainly address the needs of large agriculture producers of grains and are inaccessible to small farmers. In 2009, financial support was established for perennial plantations of fruit and berry plants and grapes, but only for varieties registered in the National Register of Breeding Achievements and under strict requirements (i.e. minimum of 5 ha, drip irrigation system, fruit frame installation, and sustainable production technical assessment), which excludes small farms where ancestral varieties are cultivated using low-input, traditional practices. Restoration of old orchards and vineyards inherited by farmers from collective Soviet farms is equally absent from these subsidy policies.

The combined effect of these policies is to push farmers to adopt low-risk crop patterns. Organizational structures contribute to this situation by perpetuating the command-and-control culture that characterized Soviet times. Local authorities have taken the place of centralized government in terms of control of water resources and land management, and tend to be influenced by local power networks to promote cotton production or favour large corporations. This distorts farmers' confidence to decide what to plant, with a detrimental impact on fruit crop diversity. However, when farmers do grow fruit and nuts they enjoy almost complete autonomy over their plots, which positively influences diversity, in contrast to local authorities' detailed control over cotton management (Lee *et al.* 2003).

Disappearance of public research services

During the Soviet era, farmers were labourers on collective farms and agronomists, supported by centrally planning research services, were in charge of disseminating

8 Rowe (2009:696-697) describes the following situation in Tajikistan: "...kitchen gardens were irrigated prior to the fall of the Soviet Union by petrol-powered pumps; however, after independence, the Tajik government could no longer afford the petrol, which has caused serious hardship since now families can only use land to which they transport water, sometimes at great distances, severely limiting crop selection" and "...most, but not all, households have fruit trees and grapevines or full access to fruit trees on the cooperative if adjacent land was too low or unirrigated. The benefit of having as many fruit trees as possible is self-evident as they provide food as well as preserves for the winter, create a shady environment and provide a limited amount of cooking fuel from pruning. In the central part of the valley the number of fruit trees in kitchen gardens ranged from two to 25, and along the periphery from four to as many as 100 (on a local administrator's plot in the village of Selbur), depending on access to water. The trees usually include hormoh (large persimmons), apples, pears, plums, apricots, peaches, cherries, and generally walnuts. Apples, hormoh, and walnuts are preferred by households because they come in late after most other produce and can be kept into the cold period when there is little to no fresh produce available. Grapevines also are prized not only for their fruit but also for their shade".

technologies (including plant varieties) and agronomic practices to them. Unfortunately, in many cases, post-independence lack of funding led to the disappearance of these services that could have helped new farmers. An absence of specialized knowledge and a lack of access to academic advisory services on fruit growing and grafting were the reality for these new farmers. This created a particularly disadvantaged position for those who wanted to dedicate their efforts to fruit crop production. This has been recognized by partners of the project as one of the main causes for the poor management and abandonment of fruit orchards. The development of innovative methods for transmitting technical information and knowledge effectively from research organizations to the new production units is essential for fruit diversity conservation in the future.

As there is a considerable scope for fruit and vegetable revenues in the five countries, further incentives for new fruit orchards and the development of nurseries are needed. The main issues highlighted by countries for supporting on farm conservation of fruit genetic resources in the future refer to: provision of agricultural machinery and equipment for processing fruit and vegetable production; microcredit to allow farmers to improve irrigation drainage systems and mechanization; and promotion of cooperatives or farmer associations that would place custodian farmers in a better position in the market. Public investment is urgently needed in transport, storage facilities and post-harvest processes to make this opportunity a reality.

Farmers' rights to access, exchange and use diverse planting material: Seed legislation and intellectual property regimes

To conserve fruit crop genetic diversity there is not only a need to focus on policy and institutional aspects to ensure farmers' access to improved seedling material, but also to adequately ensure farmers' rights to save, exchange, reuse and sell seeds.

Two relevant international treaties dealing with the conservation of biological diversity (including agricultural diversity) and the traditional knowledge associated with its use have been ratified by all five republics: the *Convention on Biological Diversity* (1993)⁹

9 The objectives of the Convention on Biological Diversity are “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding” (Art. 1).

and the *UNESCO Convention for the Safeguarding of Intangible Cultural Heritage* (2003)¹⁰. Kyrgyzstan has also ratified the *International Treaty on Plant Genetic Resources for Food and Agriculture* (2004)¹¹. However, excluding some exceptional cases, the five countries have not adopted significant measures to protect farmers' ancestral knowledge and practices from disappearing and from misappropriation. Nor have they amended laws that may impede farmers' role as custodians and generators of crop diversity by denying their contributions to countries' crop genetic heritage and hindering the exchange of their seed and planting material.

Seed laws

To manage their fruit orchards, farmers in Central Asia rely on multiple sources of planting material and related information: their own stock, neighbours, family, local markets or public research institutions, among others. This diversity of sources of planting material and related knowledge enriches fruit crop genetic diversity in farmers' fields and guarantees farmers' autonomy to choose (Van Dusen *et al.* 2006).

Laws on variety registration and seed certification, plant quarantine laws, and breeder achievement protection laws conform to the legal framework that enables and promotes the "formal seed system" in these countries. In order for plant varieties to

10 The main objective of the UNESCO Convention is to safeguard the intangible cultural heritage, which is defined as "the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artifacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity" (Art. 2).

11 The objectives of the *International Treaty on Plant Genetic Resources for Food and Agriculture* are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use. The Treaty recognises the contributions of farmers in conserving, improving and making available plant genetic resources for sustainable agriculture and food security, and calls for its member countries to establish measures oriented to ensure farmers' rights. In particular, Article 9, on Farmers' Rights, states:

9.1 *The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world.*

9.2 *The Contracting Parties agree that the responsibility for realizing Farmers' Rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. In accordance with their needs and priorities, each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers' Rights, including:*

(a) *protection of traditional knowledge relevant to plant genetic resources for food and agriculture*

(b) *the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture*

(c) *the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture*

9.3 *Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate".*

qualify for registration and release for commercialization, countries in Central Asia have established certification systems. Any variety to be released is tested to check that it complies with the requirements of being distinct, uniform and stable, and also that it has agronomic value. Complementary obligations on seed certification aim at ensuring that seed in the market meets quality standards and, in particular, that they produce plants with characteristics identical in every way to those registered in the National Register for a given variety. Fruit varieties grown in home gardens do not always respond to these legal requirements, in particular the stability conditions, which ensure that the variety reproduces the same characteristics each time the grower uses it. Stability and uniformity are frequently not found in landraces, which are valued by farmers because of their capacity to evolve in dynamic interaction with the environment and in this way adapt to local environmental conditions. As seed laws are not suited to landraces and varieties produced by farmers, seed of such varieties are left outside formal distribution channels. Seed laws tend not to be enforced in practice, so the sale and exchange of non-registered planting material among farmers and in small local markets is not penalized. The main problem is that such informal sources of seed often do not guarantee the necessary quality. This whole situation works against farmers. As seed producers, they cannot benefit from the official recognition of their varieties, and as seed consumers they cannot obtain certified quality seed of the varieties they prefer. It also works against formal organizations, which could produce and disseminate quality seed of the highest demand farmer varieties at a broader scale.

The capacity of formal organizations to provide planting material of fruit and horticultural crops differs from country to country. Nursery farming is highly developed in Uzbekistan to guarantee farmers' access to diversified planting material and to support farmers' self-reliance. Almost all fruit farms and forestry institutions in the country run their own nurseries. The Shreder Institute is considered the most reliable and best source of seed by all levels of agricultural workers (Dennis *et al.* 2003:11). Apart from the public institutes, more than 100 commercial nurseries are involved in growing seedlings of fruit crops and grapes within farm and forestry enterprises in the country. In Kazakhstan, where there is more control over fruit varieties offered in the market, farmers are obliged to order seedling material from nursery enterprises. The government provides support in maintaining a network of fruit nursery farms and issues certificates for the production and sale of planting materials of fruit crops and grapes. Records on nursery farms and mother-stock plantations are documented and controlled and, as a result, variety and quarantine certificates are officially issued. The *State Register of Commercial Varieties* includes 66 apple varieties, (including eight local and 42 ancient varieties), 7 pear, 5 apricot and 27 grape varieties, as well as 27 clone varieties of wild apple and 16 clone varieties of wild apricot. If local varieties are not included in the Register, farmers are allowed to grow them only in their own plots.

Intellectual property rights: Plant variety protection

Varieties in the National Registers can be protected under intellectual property regimes that provide certification of ownership to those breeders that have developed new varieties. It is claimed that granting intellectual property rights over new plant varieties (plant variety protection) fosters the development of new technological solutions in the field of agriculture. The breeders' monopoly over their new varieties also facilitates introduction of the varieties into national markets and ensures that breeders continue breeding effectively. Overall, it is assumed that it provides incentives to the private sector to make investments in the plant breeding sector. However, as a general rule, plant variety protection systems fail to recognize traditional farming systems' contribution to plant breeding and, at the same time, traditional farmers generally lack the capacity and economic resources to use plant variety protection schemes to protect their varieties.

Strict regulation is being established for the protection of "breeders' achievements" in all five countries: Kyrgyzstan, Tajikistan and Uzbekistan are members of the International Union for the Protection of New Varieties of Plants (UPOV), and have ratified its 1991 Act; Kazakhstan and Turkmenistan do not belong to UPOV, but their legislations follow a similar model.

The *UPOV Convention*, particularly its 1991 version, responds to the interests of industrial farming and recognises distinctiveness, uniformity, stability and novelty as criteria for plant variety protection. To accomplish these requirements, the variety is tested through a costly process. Once it has been approved, a breeder's certificate is issued, conferring on the variety owner the exclusive right to reproduce and commercialize the variety. The owner's permission is required for "producing and reproducing, offering for sale, selling or marketing, exporting, importing, and stocking for any of these purposes the propagating materials" of the protected variety (UPOV 1991, Art. 14).

Exceptions to this exclusive right are only permitted in the case of personal use with non-commercial purposes, experimental purposes and for use as an initial resource for breeding of other varieties. This means that planting material of the protected variety is only for free use of farmers in the case of private and non-commercial utilization (consumption), but under no circumstances is exchange allowed among farmers or through local fairs.

In relation to farmers' rights to save seed and reuse the material obtained for the following season, Uzbekistan and Kazakhstan laws on breeding achievement restrict this possibility to a 2-year period. Following the 1999 *Law of the Republic of Kazakhstan on the Protection of Breeding Achievements*, only "the use of the plant material obtained from peasant (small farm) cultivation in the users' own enterprise for a period of two years as seeds for cultivation of the variety on the territory of the enterprise" (Art. 25) is allowed. The 2002 *Law of the Republic of Uzbekistan on*

Breeding Achievement also states that “use by an enterprise or farm of variety seeds and breeding material, obtained from a patent owner, for reproduction for a 2-year period on the territory of this enterprise or farm” is allowed (Art. 31).

In contrast, no legal regime exists for the protection of local traditional varieties and agronomic practices, or of farmers’ rights to receive part of the benefits obtained from using farmers’ varieties for breeding and commercialization purposes. Central Asian farmers have contributed to agricultural biodiversity conservation as guardians and custodians of plant genetic resources over millennia and, as breeders, have developed varieties that are crucial for agricultural biodiversity and food security. Thus, legal frameworks should aim at enabling farmers to obtain legal recognition and ownership over their varieties and knowledge.

Empowering Central Asian farmers in sustainable management of fruit crop diversity on farm: From best practices to policies

Any initiative that seeks to support farmers with agricultural biodiversity management in Central Asia has to take into consideration that for half a century agriculture production in this region was in the hands of labourers rather than farmers. The labourers were members of a production chain in a centralized economy, and not innovators contributing autonomously to crops’ evolutionary process through their creativity and selection. By the time the five Central Asian countries became independent during the second half of 1991, traditional knowledge of the varieties and farmer practices that sustained agriculture before collective farms and monocropping had been lost. Loss of the farmer as an entrepreneur and dynamic entity, absence of farming knowledge, lack of technical and research documents or guides on fruit crop diversity, weak extension services and poor public support for the cultivation of fruit crops were the starting points for work on promoting local fruit crop diversity on farm.

To write a new history, farmers, experts and national authorities together had to start to comprehend the value of the uniqueness of fruit crop landraces and the importance of their conservation on farm to local livelihoods, national economies and, more recently, to respond to water shortages and climate change.

Although Central Asia is a centre of origin and diversity for the fruit crops that are part of the identity and culture of the populations, they have not found a proper space in agricultural sector regulations nor in biodiversity conservation strategies. Therefore, the importance cannot be overstated of the project “*In situ*/On farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central

Asia” in enabling national authorities to view their national legislation under a new perspective of genetic diversity and farmers’ rights, and supporting them to identify gaps and elaborate normative proposals.

As a result, the main initiatives under this project have focused on: 1) modifying different aspects of national legislation linked to fruit diversity conservation and implementation of farmers’ rights at the national level-long term lease land for *dekhkan* farms, land tax exemptions for dedicating land to the cultivation of local or old varieties of fruit crops and grapevine, financial support for the cultivation of local landraces, obligations regarding farmers’ responsibilities in conservation); and 2) developing draft legislation on plant genetic resource conservation and the recognition and implementation of farmers’ rights over plant genetic resources.

The notion of farmers as breeders has been promoted through proposals to certify farmer-bred varieties by State Variety Testing Commissions prior to release and patenting. In Uzbekistan, as a result of the project, joint research among farmers and scientists produced new breeding achievements. A proposal has been made to register these new varieties and to make them available in demonstration plots during the two years of the variety protection. Economic benefits arising from the exploitation of the variety will be shared among scientists and farmers according to previous agreements between them. Under this scheme, farmers are allowed to grow seedlings of their varieties for sale. Similarly, in Tajikistan, one variety of apricot and one variety of grapevine developed by farmers have been submitted to the Tajikistan State Variety Testing Commission for plant variety protection.

A register of local varieties and traditional knowledge has been developed in the framework of the implementation of farmers’ rights in all five countries. Rosters of local varieties of fruit crops and custodian farmers have been developed and presented to national authorities in the agricultural sector for them to take into account in research, development and policymaking.

The project has contributed to increased knowledge about levels and distribution of fruit species genetic diversity and the value that this diversity has for sustainable agriculture and ecosystem health. A catalogue of farmers’ achievements regarding *in situ*/on farm conservation of local varieties of wild and domesticated fruit species and a database with the names and contact details of custodian farmers have been prepared to gain support among research institutes and Ministries of Agriculture.

Promising wild forms and landraces have been identified in all Central Asian countries for future breeding and development: A total of 28 walnut (*Juglans regia*), 19 pistachio (*Pistacia vera*), 27 apple (*Malus sieversii*), 11 cherry plum (*Prunus cerasifera*) and 16 apricot (*Prunus armeniaca*) wild forms and 160 grapevine, 145 apple, 143 apricot, 32 pear, 26 pomegranate and 15 mulberry landraces have been characterized as promising and presented to national researchers and authorities. Further steps will be to publish descriptors of local varieties so that they can be exchanged together

with the register of varieties and work on demonstration plots with threatened local varieties.

Accessibility and exchange are the cornerstones of farmers' rights over plant genetic resources. Nurseries and demonstration plots have been established to enhance farmers' access to diversified germplasm and to increase the understanding of local varieties and management practices among farmers. Existing nurseries have been improved to reproduce the best local varieties of fruit crops and the best forms of wild species. Countries have developed 54 nurseries providing 800,000 saplings annually. In addition, 65 demonstration plots have been established with local varieties of fruit crops and promising forms of wild fruit species in selected agroecological zones. Farmers' capacities have been strengthened in fruit tree and vineyard management practices and nursery maintenance. Furthermore, a network of nurseries and demonstration plots will be established and will help to further monitor dissemination of fruit species genetic diversity. Governments will need to adopt, through participatory means, regulatory measures to monitor, and at the same time guarantee, farmers' access to forest genetic material for breeding.

Capacity building has been aimed to facilitate sustainable use and to add value to horticulture products. Several training programmes have been organized for the protection of orchards and vineyards from pests and diseases and for the processing and marketing of certain local varieties in Tajikistan and Uzbekistan.

The consolidation of this system of local varieties and custodian farmer registries, together with a network of nurseries and demonstration plots, is expected to enhance access to and exchange of seed, saplings and rootstocks among farmers, forest dwellers and scientists. Representation of fruit diversity and traditional farming practices in legal frameworks and policymaking at national Ministries of Agriculture and Environment will help to further institutionalize plant genetic conservation and influence policymaking.

One critical aspect has been the need to connect farmers' conservation strategies to extension services. Establishing linkages between local communities developing agricultural biodiversity and formal research and extension systems is essential for increasing the benefits of diversity to improve rural populations' welfare. With these new bonds, extension services gain knowledge of needs at grassroots level and farmers can benefit more directly from new developments and information. Five regional training centres have been created that will promote exchange of expertise among farmers, forest dwellers, researchers and policymakers (socio-economic studies in Kazakhstan, walnut genetic resources in Kyrgyzstan, apricot in Tajikistan, pomegranate in Turkmenistan and molecular markers in Uzbekistan), together with eight national training centres that will contribute to increasing awareness and building capacity.

Associations endow individual farmers with a better negotiating position and with market power, which may have the effect of diversifying planting while reducing

risks. There is a need to develop cooperation among farmers at national level related to practical aspects such as the use of machinery, transport, processing and sale of products, and maintenance of irrigation systems. Accordingly, the project has contributed to the creation and legal recognition of farmers' associations and communities with regard to fruit crop production. In Kyrgyzstan, two fruit crop farmer associations have been established in Issyk-kul and Jalal-abad Provinces and their statutes have been adopted and registered at the Ministry of Justice of the Kyrgyz Republic. In Tajikistan, farmers' associations for growing fruit crops in Istravshan District in Sughd Province and in Rasht District have been promoted among local communities. In Kazakhstan, an association of horticulture farmers, bringing together 51 farmers, has been established in Chunja village, Uygur District, Almaty Province, and was officially registered in December 2010. The association helps horticulture farmers to lobby for their interests in getting access to land, water and seeds, and help in marketing their products. In Uzbekistan, the Republican Farmers' Association was already established in 2005 by Presidential Decree; its participation has been essential in the project activities, round table discussions and meetings that have taken place between the project team and the farmers in the project sites. As a result, an Innovation Centre was newly established within the Republican Farmers' Association, and formally recognized by government Decree No. 916 of 15 July 2008, who has as main functions the support of on farm maintenance of fruit crop biodiversity through marketing of local crops products, training of farmers, development and dissemination of technical guidelines and manuals on innovative technologies on production of crops, among other initiatives.

Farmers' fairs, social networks and socio-cultural exchange practices are also of critical importance with regard to fruit crop diversity and the promotion and conservation of their related traditional knowledge. As a result of the project, diversity fairs were organized annually in the five countries, where saplings of local fruit varieties and promising forms of wild fruit and wild nut species were presented and exchanged. The purpose of the fairs was not only to disseminate planting material of local fruit crop varieties but also to increase knowledge and raise awareness among national government representatives and local communities in relation to the relevance of the conservation and sustainable use of the indigenous agricultural biodiversity of fruit crops, to value the important role that custodian farmers play in their countries, and to establish effective collaboration among farmers and development agencies.

Saplings of local varieties of fruit crops were distributed among the farmers and custodian farmers were able to demonstrate their fruit crop products before representatives of State Committees of Environment and Forestry, rural consultancy services, farmers and local communities. As a result of this exchange, custodian farmers were asked by development agencies to provide them with planting materials of local varieties of fruit crops for them to disseminate and to establish commercial orchards. Finally, fruit crop festivals such as the Apple Fest in Kazakhstan and the Apricot Flower Fest in Kyrgyzstan have been celebrated annually to raise awareness and promote national identity with local fruit crop diversity.

A website (<http://centralasia.bioversity.asia>) has been established to improve communication among stakeholders and to disseminate and create awareness of Central Asia as a centre of origin of fruit crops and a centre of wild fruit species diversity. This website brings together information from national partners on the status of crop wild relatives and identifies interventions and national plans for agricultural biodiversity conservation.

Finally, there is an increasing need to re-establish the importance of local varieties of crops and locally developed food production systems. The value of such approaches is likely to increase as the need for adaptation to climate change becomes better recognised. Climate observations show that the air temperature is steadily increasing in Central Asia; precipitation will become more variable, with increased frequency and intensity of drought and flood spells. As a result, significant decreases in water supply and agricultural production are expected. Initial steps have been taken concerning more diverse cropping patterns with the ultimate goal of sustainable agriculture and food security. In this new setting of agrarian adaptations, wild fruit species and landraces acquire clear leadership in Central Asia.

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**National Policies
on Agricultural Biodiversity
Conservation**



KAZAKHSTAN LEGISLATION ON CONSERVATION OF WILD FRUIT SPECIES IN PROTECTED AREAS AND FOREST LANDS

Chekalin Sergey and Nurmuratuly Tleu

Introduction

Since gaining sovereignty in 1991, the Republic of Kazakhstan has been actively engaged in international cooperation with regard to various legal issues including law enforcement.

In 1994, Kazakhstan ratified the Convention on Biological Diversity and the UNESCO Convention Concerning the Protection of the World Cultural Heritage, and in 1999 the country acceded to the Convention on the International Trade in Endangered Species of Wild Fauna and Flora. Kazakhstan has ratified a total of 20 conventions and international treaties directed at conservation of the natural environment as well as certain components of biological diversity.

In 1994 Kazakhstan developed the *National Program for Rational Use of Natural Resources* and in 1999 the *National Strategy and Action Plan for Conservation and Balanced Use of Biological Diversity*. In accordance with the priorities of the Convention on Biological Diversity, Kazakhstan has chosen *in situ* conservation of biodiversity components as its main approach, especially through the creation of protected natural areas (SPNA) around their habitats. This has been formalized in legal documents of the republic that ensure enforcement of international commitments and national priorities.

Legislation in the area of nature conservation in Kazakhstan was developed in two stages – the first stage (the 1990s) and the adjustment stage (first decade of the 21st century). *Land, Forest, Water, Criminal Codes* and the *Code of Administrative Offences*, and *On Taxes and Other Mandatory Payments to the Budget* and other laws were developed in the first stage. The Laws of the Republic of Kazakhstan *On Protection and Use of Historic and Cultural Heritage*, *On Environmental Protection*, *On Environmental Impact Assessment*, and *On Specially Protected Natural Areas* were also adopted during this stage.

New editions of the *Forest, Land and Water Codes* were adopted in 2003, while new editions of the laws *On Specially Protected Natural Areas*, and *Sustainable Development Concept of Kazakhstan* were endorsed in 2006. The *Ecological Code* of

the Republic of Kazakhstan, which summarized legal documents of Kazakhstan in the field of nature protection and environmental management, was adopted in 2007. As a result of adoption of the *Ecological Code*, the Laws of the Republic of Kazakhstan *On Environmental Impact Assessment* and *On Protection of the Atmospheric Air* ceased to be in force. The Law of the Republic of Kazakhstan *On Amendments to Some Legal Documents of the Republic of Kazakhstan on SPNA Issues* (2008) has ensured further coordination of the nature conservation law.

Accordingly, the principal legal instruments of the Republic of Kazakhstan that are currently in force in relation to the conservation of fruit crop wild relatives include the following:

- *Law on Environmental Protection*, 1997
- *Forest Code*, 2003
- *Land Code*, 2003
- *Water Code*, 2003
- *Law on Specially Protected Natural Areas*, 2006
- *Concept of Sustainable Development*, 2006
- *Ecological Code*, 2006
- *Law on Amendments to Some Legal Documents of the Republic of Kazakhstan on SPNA Issues*, 2008.

The Forest Code (2003), which regulates public relations on ownership, use, management of forest resources, and establishes legal frameworks of protection, conservation, regeneration, raising of ecological and resource potential of the forest reserve and its sustainable management, has great importance for the conservation of wild relatives of fruit crops. Regulation of forest legal relations was implemented on the premise that forests are one of the most important components of the biosphere, and have a global environmental, social and economic importance. The whole forest reserve is owned by the state.

The flora of Kazakhstan is rich in both specific and intraspecific diversity of fruit crops. Among them the most widely distributed are apple, apricot and pear, which still grow in natural conditions. The *State Register of Breeding Achievements*, accepted for use in the Republic of Kazakhstan, includes 27 clone-varieties of wild apple and 16 clone-varieties of apricot.

The system of specially protected natural areas (SPNA)

The majority of natural habitats of rare fruit species agricultural biodiversity in Kazakhstan has the status of Specially Protected Natural Areas (Table). Over the years of sovereignty, apple and apricot habitats have been expanded in the Ile-Alatau National Natural Park and the Dzhungar National Nature Park has been established (450,000 ha). These national natural parks are home to Niedzwetski apple (*Malus niedzwetzkyana*), Sievers apple (*Malus sieversii*), common apricot (*Armeniaca*

vulgaris), wild grapes (*Vitis vinifera*) among others; they have been created for the protection of wild fruit forest ecosystems, natural habitats of companion species of agricultural biodiversity and conservation of viable populations. Protection status and regimes apply to communities or systems of plant communities rather than to a certain species. Thus, protection measures apply to habitats and their vital biotic and abiotic components, such as the restoration of the natural genetic structure of natural populations of Sievers apple and common apricot. Genetic erosion of natural apple and apricot populations emphasizes priority of measures aimed at restoration of the genetic structure of populations of these species under protection.

Fruit agricultural biodiversity under state protection in Kazakhstan includes Yanchevski current (*Ribes janczewskii*), Niedzwetski apple (*Malus niedzwetzkyana*), Sievers apple (*Malus sieversii*), and common apricot (*Armeniaca vulgaris*) as well as wild grapes (*Vitis vinifera*). The protection status of these crops has been codified in the *Resolution No. 1034 of the Government of the Republic of Kazakhstan On Approving the List of Rare and Endangered Animal and Plant Species* of 31 October 2006. The aforementioned species grow in two areas of Kazakhstan: in the southeast (the Almaty Province) and in the south (Zhambyl and South Kazakhstan Provinces).

The framework concerning conservation of biodiversity and SPNA is stipulated in the *Ecological Code of the Republic of Kazakhstan* (2007). Articles 7-9 of the Code are of fundamental importance with regard to the issues in question:

Article 7. Units of Natural Environment Protection

1. land, subsoil resources, surface and ground water; atmospheric air; forests and other vegetation; fauna, gene pool of living organisms; natural ecological systems, climate, and the Earth's ozone layer are subject to protection from destruction, damage, pollution and other harmful impact;
2. specially protected Natural Areas and items of the National Natural Reserves Fund are subject to special protection.

Article 8. The National Natural Reserves Fund

1. the National Natural Reserves Fund includes all environmental sites under state protection that have special ecological, scientific, historical and cultural and recreational values as natural benchmarks, unique objects of their kind, objects of research, education, enlightenment, education, tourism, and recreation;
2. the sites of the National Natural Reserves Fund are established according to the *Law of the Republic of Kazakhstan On Specially Protected Natural Areas*;
3. protection of the National Natural Reserves Fund is ensured through establishment of Specially Protected Natural Areas as well as setting bans and restrictions in relation to the use of natural sites that have extrinsic ecological, scientific, historical, cultural, and recreational value.

Specialy Protected Natural Areas (SPNA) in Almaty, Zhambyl and Southern Kazakhstan Provinces

Region	Preserved area	National parks	Natural monuments	Wildlife sanctuaries	Other types of SPNAs
Almaty	1. Almaty 2. Alakol	1. Ile-Alatau 2. Charyn 3. Altyn-Emel 4. Dzhungar-Alatau	4	7	Ili Botanical Gardens The Main Botanical Gardens * Zhusandali Area
Zhambyl	Aksu-Dzhabagly*	-	-	3	* Zhusandali Conservation Area
Southern Kazakhstan	1. Aksu-Dzhabagly* 2. Karatau	Sayram-Ugam	-	5	Arys and Karatau (single reserved area) Southern Kazakhstan Reserved Area
TOTAL	4	5	4	15	Reserved areas - 3 Botanical Gardens - 2

* SPNAs are located in the area of two regions.

Article 9. An Specially protected Natural Area

1. an Specially protected Natural Area is represented by a parcel of land, with water bodies and the air space above, along with natural complexes and sites of the National Natural Reserves Fund, for which the special protection regime has been established;
2. types of Specially Protected Natural Areas, establishment procedures, preservation regimes, and specific features of organizational activities of individual types of specially protected natural areas are stipulated in the Law of Republic of Kazakhstan *On Specially Protected Natural Areas*.

In accordance with the *Law of the Republic of Kazakhstan On Specially Protected Natural Areas* (2006) the main types of protected areas include national reserves, state national nature parks, nature reserves, wildlife sanctuaries, natural monuments, and preserved areas. These objects may have a status of both national and local importance. Objectives, functions and modes of protection of these facilities are stipulated in the law at issue:

- state nature reserves, state national nature parks, state nature reserves, and state regional nature parks have a status of legal entities and are created as government agencies;

- state zoological parks, public botanical gardens and intergovernmental arboreta have a status of legal entities and are established as government agencies;
- state natural monuments, state nature sanctuaries and state preserved areas do not have a legal status and are under state protection.

As of December 31, 2011 the *List of Protected Areas of National Importance* includes 114 sites, including 10 natural reserves, 12 national parks, 4 state nature refugiums, 5 botanical gardens, 26 natural monuments, 57 natural wildlife preserves and 5 sanctuary areas. The protected areas of national importance keep State Passports and all relevant data are recorded in the State Registry which was started in 2001. The number of protected areas of local importance today is practically incalculable and their inventory is non-existent.

Adoption of the *Law of 2006 On Specially Protected Natural Areas* in the new edition has resolved a significant portion of problems. There is an ongoing update of the relevant set of bylaws. At the same time, there are some inconsistencies of certain laws and regulations that require alignment and uniform interpretation. There is a whole layer of “white spots” in the legislation with regard to the management and activities of SPNAs that should be adjusted by the system of new legal instruments as promptly as possible.

Challenges and ways of enhancing SPNA legal framework

Legal norms for liabilities to be imposed for damage to protected natural objects have been developed and introduced. The *Code of the Republic of Kazakhstan On Administrative Offences* (2001) sets forth the basics and principles of administrative liability, types of administrative acts and types of penalties imposed for committing them, as well as procedures for imposing administrative penalties for violations. Chapter 13 of the Code provides a list of administrative offenses, such as encroachment on property, including objects in protected areas (Articles 121-126). Chapter 19 outlines administrative offences in the field with regard to protection of the environment and natural resources (Articles 240-306).

One type of administrative offence under Article 297 of the Code recognizes the violation of the SPNA protection mode: “... Violation of the state nature reserves, state national parks, state natural parks, natural monuments, national wildlife refuges and other protected areas or other actions that may lead to a reduction in the number of or impair the habitat of plants and animals is punishable by imposing fines amounting to ten monthly calculation indices (MCI) on citizens, for officials up to twenty, and for legal entities up to one hundred. Giving illegal instructions or illegal resolutions for violation of the environmental protection regime of protected areas is subject to a fine on officials in the amount of twenty-five MCI.”

The Code provides for the right to consideration of administrative offences on the part of government agencies and certain categories of officials. These categories do not,

however, include officers of protected areas (reserves, national parks). It is assumed that certain special bylaws will be assigned to them as state inspectors of nature conservation with the corresponding administrative rights.

The *Criminal Code of the Republic of Kazakhstan* (1997) provides for criminal liability for violation of environmental requirements in production and use of potential environmentally dangerous biological substances (Article 278), illegal procurement of aquatic animals and plants; illegal hunting (Article 287); violation of rules for the protection of fauna (Article 288); illegal handling of rare and endangered species of plants and animals (Article 289); illegal procurement, purchase, and sale as well as the elimination of rare and endangered plant and animal species listed in the Red Book of the Republic of Republic of Kazakhstan or their habitats (Article 290), illegal felling of trees and bushes (Article 291), destruction or damage of forests (Article 292); violation of the regime of protected areas (Article 293).

The *Law of the Republic of Kazakhstan On Taxes and Other Mandatory Payments to the Budget* (2001) sets forth types, rates, and procedures for payment of taxes and tax-like payments. In particular, the law outlines principal provisions for the land tax for the use of especially protected territories. According to Article 123 of the Law, the land of SPNAs as well as lands under conservation in line with the Decision of the Government of the Republic of Kazakhstan (for example, those that are reserved for the establishment of SPNAs) are not subject to taxation. Nature reserves, national parks, arboreta, and zoological parks, and botanical gardens are exempt from payment of the land tax. In this case, all the above-mentioned legal persons are not exempt from payment of the land tax, if it is provided for use or rented.

The *Land Code of the Republic of Kazakhstan* (2003) provides for legal relationships in the area of land resource use and conservation including SPNA lands. A special category of land was created “SPNA lands, lands of sanatorium, recreation, and historical and cultural designation”.

The competence of the Government in terms of SPNA land includes “...granting and withdrawal of land plots from lands of all categories in relation to the establishment and expansion of SPNA of national significance, implementation of international obligations...” and “...approval of the procedure of assigning lands to SPNA and reserved land of reserved land for these territories, as well as the list of SPNA territories of national and international significance”.

The competence of Local Executive Agencies in some SPNA lands include “...reserving land for establishment of SPNA” and “...granting and withdrawal of land plots from lands of all categories in relation to the establishment and expansion of SPNA of national significance, implementation of international obligations...” (the latter except for cases related to the establishment and expansion of SPNA of national significance within the competence of the Government).

According to Presidential Decree No. 422 of 28 July 2000, specially protected national territories have been included on the list of state property sites that are not subject to privatization. It should be pointed out, however, that there is a certain degree of inconsistency in this provision concerning the status of certain types of SPNAs. Notably, the *Law of the Republic of Kazakhstan On SPNAs* states that "...state natural wildlife reserves shall be established on land plots without their withdrawal from owners and users of the land plots..." In other words, if a wildlife reserve establishment has been declared on a proprietor's land (without buyout of the land plot to make it state property), then the above-mentioned provision shall not be effective. This is also the case for natural monuments, reserved areas and a number of nature reserves, which needs to be resolved at the legislative level.

The *Concept of SPNA Development and Placement in the Republic of Kazakhstan until 2030*, approved by Government Decree No. 1692 of the Republic of Kazakhstan of 10 November 2000, has been developed. The following are the key objectives of this Concept:

- preservation of the integrity of natural ecosystems, reference and unique natural complexes and other sites of natural heritage;
- restoration of disturbed natural complexes and sites;
- development and application of scientific methods for conservation of natural systems under the conditions of intended use of protected areas;
- organization of a network of protected areas;
- implementation of state regulation of protected areas;
- creation of conditions for regulated tourism and recreation in natural conditions, further development of tourism and recreation considering the type of SPNA, its functional zones, socio-economic factors and interests of local people; and
- environmental education of the population.

The above laws and regulations can and should be considered as a legal framework for biodiversity conservation - including fruit agricultural biodiversity - in Kazakhstan. However, there are still a number of unresolved problems. These include:

- failure to provide protection of flora and fauna species beyond SPNA;
- no mechanisms of community involvement in decision-making (management) in the area of SPNAs have been developed. The activities of SPNA are structured without taking into account the need for broad awareness-raising activities regarding biodiversity consideration and the need for gaining benefits from this activity for local populations;
- the ongoing financial reform fails to encourage self-financing at nature protection agencies, since their use and spending mechanism on the territory of SPNAs suggests a turnover of cash funds through the budget. This mechanism does not allow for a flexible and timely response to the needs of SPNAs;
- there is still an open issue of funding SPNAs that do not have a status of legal entities (reserved areas, wildlife sanctuaries, and natural monuments). Their maintenance expenses lie with the forest and flora conservation agencies and fail to meet actual conservation needs; and

- state natural reserves and state national natural parts have no right of involving academic and research organizations for research, which resulted in a decrease in the level of research on their territories.

Resolution of these issues as well as clarification of conservation regimes for fruit agricultural biodiversity are pressing tasks for both today and tomorrow.

Fruit and nut species under protection

The *Red Data Book* of plants in Kazakhstan was published in 1981 (Red Data Book of Kazakh SSR Rare Endangered Species of Animals and Plants, Part 2. Plants, Alma-Ata, 1981). It provides for protection of 300 plant species by the government. According to current understanding, there should be at least 400 such species.

The fruit agricultural biodiversity of Kazakhstan includes no species with an “endangered” status. In relation to a decrease in the number and habitat of species and varieties, the government assumed protection of Yanchevski currant (*Ribes janczewskii*), Niedzwetski apple (*Malus niedzwetzkyana*), Sievers apple (*Malus sieversii*), and common apricot (*Armeniaca vulgaris*), as well as wild grapes (*Vitis vinifera*). Protection status has been confirmed in the Government Resolution of the Republic of Kazakhstan No. 1034 *On Approving of the List of Rare and Endangered Species of Animals and Plants* of 31 October 2006. The above species grow in two regions of Kazakhstan: in the southeast (Almaty Region) and in the south (Zhambyl and South Kazakhstan Regions).

Conclusions

Under current conditions, developed and effective laws of Republic of Kazakhstan and regulating/normative acts ensure the conservation and use of wild relatives of fruit crops. The main direction of activities on biodiversity conservation is the normal functioning of existing Specially Protected Natural Areas and reserves, as well as expansion of their territories, where economic activity is prohibited and only natural environmental factors are active. Strict maintenance of provisions of active laws, particularly the *Forest Code of Republic of Kazakhstan*, will ensure the conservation of wild relatives of fruit crops.

Recommendations

Within the UNEP-GEF project “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*” coordinated by Bioversity International the national project team in Kazakhstan developed the

National Methodology of Assessment and Conservation of Agrobiodiversity of Kazakhstan's Mountain Fruit Forests which states the following:

- currently, the Law of the Republic of Kazakhstan *On Specially Protected Natural Areas* (2006) sets reservation conditions within genetic reserves, which disallows not only “corrections” in the genetic structure of a species under protection, but also any “control” of alien species. It will be impossible to implement the most important activities for restoring the genetic structure (including new forest crops) and for protecting from alien species in the mode of nature protection at most gene reserves. There is a clear need to adjust the law to bring the nature conservation mode of genetic reserves into compliance with the strategy and methodology for the conservation of agricultural biodiversity;
- so far there is no special Law *On Flora* in Kazakhstan, but a Law *On Fauna* has been adopted. Adoption of the Law *On Flora* should create a legislative framework for plant diversity conservation in Kazakhstan in the following aspects:
 - organization and management of control over the status of flora objects and their scientific rationale;
 - state conservation status of rare and endangered plant species, plant communities and ecological systems, and procedures for establishing such status, measures and regimes for the protection of objects with a certain status and mechanisms for their implementation;
 - control and regulation of alien species;
 - conservation of plant genetic resources; and
 - requirements for flora conservation during various types of economic activities.

There is also a need for:

- development and adoption of Laws *On the Conservation and Use of Flora*, *On the Conservation and Reproduction of Endangered Species* and *On the Conservation of Genetic Resources*;
- stronger coordination between conservation, law enforcement, and customs agencies aimed at interception of export and streamlining a domestic turnover of species listed in Annexes I and II of CITES convention for local flora and fauna species. Inclusion of Kazakh rare and endangered species on the IUCN List;
- bringing provisions of criminal legislation in compliance in terms of scale of damage caused to biological diversity and SPNA;
- development and implementation of economic incentives for activities aimed at conservation of biological diversity, establishment of new forms of SPNA that are privately owned;
- development of an effective payment system for the use of SPNA.

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KYRGYZSTAN LEGISLATION ON AGRICULTURAL BIODIVERSITY CONSERVATION

Koychumanov Baktybek and Sharsheev Bulan

Introduction

The Kyrgyz Republic, a mountainous country located in the center of the Eurasian continent on the high mountain massif of Tien Shan and Pamir-Alai, has a total area of 199,9 thousand square kilometers (5.3% forests, 4.4% water, 53.9% agricultural land, 36.4% other land). Almost 90% of the territory is located above 1,500 meters above sea level. The length of the country from north to south is 453.9 km (39 ° 15 ' - 43 ° 15' north latitude), from west to east 925 km (69 ° 15 ' - 80 ° 15' east longitude).

Rivers of Kyrgyzstan belong to inland Central Asian basins: Aral, Tarim, Issyk-Kul, and Balkhash. The total yearly runoff is about 50,000 km³. The wellbeing of Central Asian people depends almost entirely on rivers originating in high mountains, and the well-being of rivers depends entirely on conservation of natural ecosystems in zone of formation of their runoff.

The relative abundance of biodiversity here is possible because of the high mountain systems of the Tien Shan and Pamir-Alai that rise to the height of up to 7,000 meters above sea level, and accompanying accumulation of moisture from the upper layers of the atmosphere. High mountains seem islands of biodiversity in the middle of monotonous plains. The nature of the country's biodiversity reflects the high altitudes of a considerable part of the territory, where mountain and alpine species prevail.

The Kyrgyz Republic is thus home to a rich diversity of biological resources – both species and ecosystems. Despite its small size, the Kyrgyz Republic possesses about 1% of all known species on only 0.13% of the earth's surface. Kyrgyzstan is home to 574 species of terrestrial and aquatic vertebrate animals, to more than 10,000 invertebrates and about 4,000 species of higher plants. The structure of lower plants is poorly studied.

The state of many species of flora and fauna causes concern. Fifty-seven species of birds, 23 species of mammals, two species of amphibians, eight species of reptiles, seven species of fish, 18 species of arthropods, as well as 87 species of higher plants and fungi are threatened with extinction and included in the list of threatened and

endangered species awaiting inclusion in the *Red Data Book of the Kyrgyz Republic*, approved by Government Decision No. 170 of 28 April 2005 (with amendments and additions to No. 471 of 25 July, 2009).

In general, the Republic has favorable natural conditions, but gradually increasing anthropogenic impact on the environment makes it difficult to conserve many plant species. Significant damage to their populations and their habitats was caused by eliminating tree and shrub vegetation through plowing land and desiccating bodies of water.

There is no natural ecosystem left which is not affected by human influence. Foothill plain steppes, riparian forest (tugai) and wetland complexes in the Chuy Valley, dry steppe, semi desert, and desert ecosystems have virtually disappeared in the Ferghana zone. Ecosystems downstream of rivers were degraded due to contamination and withdrawal of water for irrigation. In steppe, desert and semi-desert ecosystems of the foothill plains and intermountain valleys, riparian tree and shrub vegetation are exposed to heavy grazing damage. This process was intensified close to populated areas after the passage from raising cattle on collective farms to private ownership.

It is necessary to highlight with special attention the effects of continued desertification and climate change from the effects of other environmental factors affecting the state of agricultural biodiversity. Both of them have resulted in biological communities reduced to the danger of extinction. Existence of life on steep mountain slopes requires an average 1.5 to 2 times more energy expenditure than under similar climatic conditions on the plain. A considerable part of the area is under snow cover for almost half the year. The continental climate is represented in a sharp fluctuation of daily and seasonal temperatures and sharp changes in precipitation.

Anthropogenic activities aggravate the action of negative environmental factors. The felling of trees and shrubs, collection of medicinal and aesthetically attractive plants, unsystematic grazing and haymaking are supplemented by indirect impacts on the environment by pollution, habitat destruction through the creation of arable land, roads, human settlements, mining companies, reservoirs, etc. The resulting fragmentation of natural habitats, leads to the reduction in the number of species and in their rate of reproduction. Many of them are close to extinction. Disappearance of forest areas, where at least half of the country's species diversity is concentrated, is especially dangerous. Walnut, pistachio and almond forests are sources of the rich genetic heritage of ancestral forms of cultivated varieties of walnut, apple, pear, grape, alycha, almond and pistachio, which are necessary for breeding new varieties.

Current legal instruments of the Kyrgyz Republic govern a wide range of legal relations pertaining to the conservation of biological diversity. In particular, they set standards and requirements for the conservation of nature in the process of economic or other activities, determine types of environmental violations, liabilities and procedures of assigning responsibility as well as the procedures for using natural resources,

the norms and quotas of seizure. They also provide for protective and restorative measures. They set the grounds for the conservation and restoration of the most important complexes of plant and animal species, ecosystems and landscapes to the status of natural sustainable reproduction, sustaining and restoring viable populations of species in their natural habitats (*in situ*) and conservation of biodiversity components outside their natural habitats (*ex situ*).

The legislation on preservation of the environment consists of more than 200 normative legal certificates. The basic normative framework on environmental preservation is the Law of the Kyrgyz Republic No. 53 *On Environmental Protection* of 16 June 1999 (in the edition of Kyrgyz Republic Laws No. 22 of 4 February 2002, No. 101 of 11 June 2003, and No. 113 of 11 August 2004).

This Law covers a broad spectrum of questions, specifying that natural resources can be used according to the established norms and ecological standards, a lawful mode for establishing especially protected zones, a rule and procedures on the use of natural resources, and methods of work during states of emergency. Natural resources can be used according to the established restrictions and ecological standards. Ecological standards include: an admissible level of concentration of polluting substances in the air, water, ground and subsoil; admissible levels of sewage, emissions and radiation; rules on the use of chemicals in agriculture; admissible concentrations of chemical and biological substances in consumer goods. The Law forbids the use of toxic chemicals which do not decay, and the importation of radioactive waste and materials for warehousing, accommodations and transit.

The Law states the principles for environmental preservation that create a conceptual basis for the protection of the constitutional rights of every person to a favorable and healthy environment. These principles of preservation of the environment give priority to measures aimed at guaranteeing human rights in the ecological sphere, concerning principles of essential development and the complex approach to regulating ecological and economic actions, transparency in decision-making and involvement of non-governmental organizations in ecological actions.

Specially protected natural areas

On 28 May 1994 the Kyrgyz Republic passed the *Law Concerning Specially Protected Natural Areas*, which legislates the protection and use of specially protected natural areas (SPNA), with a view toward preservation of unique natural complexes.

Since the adoption of the above-mentioned *Law of the Kyrgyz Republic Concerning Specially Protected Natural Areas* in 1994, Kyrgyzstan joined a number of Global Environmental Conventions: *Convention on the Protection of World Cultural and Natural Heritage* (1995), *Convention on Biological Diversity* (1996), *Convention to Combat Desertification* (1995), *Convention on Environmental Impact Assessment in a*

Transboundary Context (2001), *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus)* (2001), *Convention on Wetlands (Ramsar)* (2002), *UN Framework Convention on Climate Change* (2000), *Convention on International Trade in Endangered Species (CITES)* (2006).

Considering the commitment of the Kyrgyz Republic to international conventions, it was necessary to develop a new edition of the mentioned law. The new *Law of the Kyrgyz Republic On Specially Protected Natural Areas* was adopted by the *Jogorku Kenesh* of the Kyrgyz Republic on 21 April 2011, and was signed by the President of the Kyrgyz Republic on 4 May 2011. This law regulates relations in the area of organization and management, protection and use, and control of specially protected natural areas with the purpose of maintaining typical and unique natural complexes and objects, natural formations, gene pools of flora and fauna, the study of natural processes in then biosphere and control of changes in their condition.

It can be noted that this law regulates a wide range of legal relations connected to SPNA and biodiversity conservation, in particular, it:

- defines the legal state of SPNA and the procedure for their formation;
- defines the procedure for the use of natural recourses in SPNA;
- defines standards and requirements for protection of the environment during the implementation of economic activities;
- orders categories of SPNA, which are close to the categorization system of the International Union for Conservation of Nature (IUCN);
- includes regulations on the development of ecological tourism in specially protected natural areas;
- consolidates concepts of zoning of specially protected natural areas and of the regulation of resulting zones;
- lays down norms for the participation and encouragement of local people, local communities and non-governmental organizations in the processes of planning, organization and functioning of SPNAs for ensuring information transparency, accessibility and awareness;
- introduces a new section on transboundary protected natural areas, their regimes, as well as ecological corridors; and
- defines the principles of international cooperation in the area of biodiversity conservation and development of SPNA networks and other issues.

New concepts were introduced in the new law such as: “specially protected natural areas network”, whose main aim is to create an integrated and functionally connected protected natural areas. Categories of specially protected natural areas are also well defined:

1. state nature preserves;
2. state nature parks;
3. wild preserves;
4. nature monuments;
5. botanical gardens, zoological parks and dendrological specimens;

6. biosphere reserves and / or reserves; and
7. transboundary specially protected natural areas.

Different zones have been established in order to ensure a proper regime for protection of specially protected natural areas, in particular the main or protected (core zone) as well as buffer and other zones. In this law it is noted that specially protected natural areas can be used for ecological tourism, to attract local communities and local people to the sustainable functioning of specially protected natural areas and to familiarize them with natural and historically-cultural attractions of the area.

The establishment and operation of environmental excursion routes, tourist trails, the arrangement of touristic facilities, museums and exhibitions in the open air on specially allocated sites, is permitted, depending on the specified zone as determined by the specially authorized state body for environment protection.

The concept of “State cadastre of specially protected natural areas” is introduced, which includes information about the category, purpose, geographic location, borders, security regime of the area, as well as its biological, ecological, educational, scientific, economic, historical and cultural value. The aim is to assess the state of the nature reserve fund, to determine the prospects for development of a network of given areas, to improve the efficiency of state control over compliance with the regime, as well as to register given areas in planning socio-economic development of regions.

For the first time zoning of *state natural reserves* is being introduced so that different regimes of protection and use are allocated within the territory of state nature reserves: core, buffer and protection zones.

The Law states that the core zone is area in which the whole natural complex is strictly protected, monitoring of ecological systems state are conducted and scientific and other activities do not disturb the natural development of natural resources. The core zone is at least 75 percent of the total area of the state natural reserve. Any economic or other activity disturbing the natural development of natural processes or threatening adverse effects on natural complexes and objects are prohibited in this core zone.

The law defines the regulation of buffer zones of state nature reserves, which usually surround the core zone and are used for scientific research, traditional activities with extensive forms of management, including regulated use of agricultural lands, and the organization of eco-tourism. In buffer zones it is prohibited to:

- establish new settlements;
- provide territories for hunting and allocation of hunting bases;
- construct, allocate and exploit manufacturing entities;
- explore and exploit mineral resources;
- fell trees;
- import (acclimatize) new plant and animal species; and

- carry out actions that change the hydrological regime of the reserve's core and other activities that can have an impact on the ecosystem as a whole.

According to the regime established for the protection zone of state nature preserve, it is noted that these zones are established to reduce the impact on the entire natural complex of the results of economic activities of local communities living close to its territory. In the protection zone of state natural reserves it is allowed to carry out main economic activities that do not affect the state of natural resources. Furthermore, in protection zones of state natural reserves it is prohibited to:

- collect endangered medicinal plants, fruits, berries;
- hunt or trap animals, destroy nests, burrows and other shelters and homes of wild animals as well as collect eggs of birds and reptiles;
- introduce wild animals; and
- carry out other activities that result in reduction of natural, scientific, cultural and aesthetic significance of state nature preserves.

It is especially stipulated in the regulations for the protection of *state natural parks* that different regimes of special protection should be established with consideration of the natural, historical, cultural and other characteristics of the parks. The following aspects are considered in the regulation of state natural parks:

- reserve regime;
- ecological stabilization;
- touristic and recreational activities; and
- limited economic activities.

In terms of regimes determined for state natural preserves, in zones of environmental stabilization, a regime of protection with prohibition of economic and recreational activities except controlled eco-tourism activities and activities on restoring damaged natural complexes and objects - is to be established.

In zones of touristic and recreational activities, a regime of protection, ensuring the conservation of natural complexes and objects is established, where regulated tourist and recreational use (except hunting) is allowed, including organization of tourist routes, trails, bivouac sites, and observation areas with consideration of recreational loads regulation.

For the objective of administrative and economic regulation of zones of limited economic activity, those activities necessary for ensuring the protection and functioning of public nature parks, servicing their visitors (including organization of amateur (sport) hunting and fishing) can be carried out, as well as the construction and operation of recreational centers, hotels, campgrounds, museums and other objects of tourist service facilities.

On the territory of the state natural parks it is prohibited to engage in any activity that creates a threat of adverse impact on protected natural complexes and objects, in particular:

- actions that result in changing the hydrological regime;
- construction and operation of industrial and other facilities not connected with activities of state natural parks;
- development of mineral resources;
- tree felling;
- importation (acclimatization) of new species of wild animals and plants; and
- other activities that result in reduction of the natural, scientific, cultural and aesthetic significance of the state natural park.

Missions and regimes of *botanical gardens, dendrological and zoological parks* were formed with the purpose of biodiversity conservation and enrichment of flora and fauna under the Decision of the Government of the Kyrgyz Republic on the introduction of specially authorized state bodies in areas of environmental protection on the basis of scientific justification by the Academy of Sciences of the Kyrgyz Republic. Territories of botanical gardens, dendrological and zoological parks are intended only for their specific purposes. Land plots are transferred for permanent use to the scientific research or educational institutions in charge of botanical gardens, dendrological and zoological parks. The main objectives of botanical gardens, dendrological and zoological parks include:

- *in vitro* conservation of collections of living plants, wild animals (especially rare and endangered species) of local and foreign flora and fauna, having great scientific and cultural-educational value;
- the conducting of scientific-research; and
- the conducting of training-educational, scientific-educational work in the field of plant growing, zoology and nature protection.

On the territory of these botanical gardens, dendrological and zoological parks any activity not related to performance of their tasks, and resulting in disturbing the conservation of flora and fauna is prohibited.

The 2011 Law of Kyrgyz Republic *Concerning Specially Protected Natural Areas* contains a special chapter on *Biosphere territories and reserves*, which represent plots of terrestrial and aquatic ecological systems, or combinations of these ecosystems, ensuring a stable balance of biological and landscape diversity, economic development and protection of appropriate cultural values. The Biosphere Reserves are established with the aim of:

- conservation, restoration and use of natural areas with a rich cultural and natural heritage;
- supporting long-term, sustainable economic and social development of the region, including recreational use, with consideration of conservation and restoration of natural resources; and

- conducting long-term environmental control, monitoring and scientific research, as well as environmental education and training.

A Biosphere territory or reserve is formed by the Decision of Government of Kyrgyz Republic following the proposal by a specially authorized state body in the area of environmental protection on the basis of relevant scientific justification and technical design.

In addition, the law contains a chapter on *transboundary and specially protected natural areas of international importance*, which notes that these areas are established within the framework of international treaties signed by the Kyrgyz Republic. These areas are organized with the aim of maintaining the overall ecological balance of the biosphere and of biodiversity conservation of endangered flora and fauna included in the *Red Book of the Kyrgyz Republic* and neighboring countries, executing commitments of the Kyrgyz Republic under international treaties. Transboundary and specially protected natural areas of international importance are intended for fulfillment of following tasks:

- implementing international cooperation in the area of protection and use of territories and objects of nature reserves funds within the framework of bilateral and multilateral treaties;
- development and implementation of international scientific and technical programs, directed to conservation of the natural reserve fund;
- exchange of scientific information;
- establishment of reserves, natural parks and other entities of the natural reserve fund on adjacent areas;
- organization of joint training of scientific specialists; and
- ecological, educational and other activities.

Issues of conservation and access to genetic resources are not directly specified in the legislation of Kyrgyz Republic, but it should be noted that in the *Environmental Code of the Kyrgyz Republic* (adopted on 15 January 2009 by Parliament in its IV convocation, but not signed and sent by the President for improvement) these issues are regulated by Chapter 24 “Access to genetic resources”. At present, considerable attention is given from state governing bodies to SPNA and the biodiversity conservation sector. The laws in force in the Kyrgyz Republic — *On Environmental Protection, On Specially Protected Natural Areas* and *On Biosphere Territories in the Kyrgyz Republic*, as well as resulting subordinate regulating acts of legislation, regulate relations in this area, create a framework for conservation and regeneration of complexes of the most important species of flora and fauna, ecosystems and landscapes with natural sustainable reproduction, maintenance and regeneration of viable populations of species in their natural environment (*in situ*) and conservation of components of biological diversity outside of their natural habitats (*ex situ*), define the parameters for expansion of the SPNA area.

It should be noted that in the Concept of Ecological Security of the Kyrgyz Republic, measures of biodiversity conservation are consolidated: the development of a national biodiversity strategy'; expansion of SPNA areas up to 10%; creation of an ecological network, which includes various categories of SPNA in different ecosystems, protecting 60-65% of species listed in the *Red Book of Kyrgyz Republic*; assessment and inventory of biodiversity objects.

The State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic (State Agency) has developed a new draft *Biodiversity Conservation Strategy and Action Plan on Biodiversity Conservation for the period 2011-2025*, which is currently in the process of clearance through the ministries and administrative departments of Kyrgyz Republic. *The Action Plan on Biodiversity Conservation for the period 2011-2025*, with the aim of covering diversity of wild relatives of fruit crops, includes activities on the creation of state preserves and state national parks, activities on in situ and ex situ biodiversity conservation and several others.

The state preserves "Sarkent" and State Natural National Park "Surmatash" were established in 2009, The Provisional Government of the Republic issued a decree approving the establishment of the state preserves "Dashman" and State Natural National Park "Avletim" in 2010. Unsolved issues of financing the designated SPNAs, due to the difficult state of government budget, do not allow them to function properly.

Framework for fruit and nut species protection and use

The first edition of the *Red Book of Kyrgyzstan* was published in 1985. It listed 65 kinds of higher plants, including the following fruits: 1) Knorring hawthorn; 2) Kachgarik barberry; 3) Usunakmatik grape; 4) ordinary pomegranate; 5) Korjinsky pear; 6) Central Asian pear; 7) fig; 8) Petunnikov almond; 9) Prunoaflatunia; 10) Persian mountain ash; 11) Turkestani mountain ash; 12) Yanchevsky currant (the leucocarpous form); and 13) Nedzvedsky apple. On 28 April 2005 the Governmental Order of the Kyrgyz Republic approved the new list, including 83 kinds of higher plants. The second updated edition of the *Red Book of the Kyrgyz Republic* was published in 2007 with a total of 527 pages. The following fruit crop cultivars were taken from the old Red Book list for various reasons: 1) fig; 2) Yanchevsky currant; 3) Turkestani mountain ash; 4) Prunoaflatunia; 5) ordinary pomegranate. A species of apple Seiversi was added. Currently, there are nine kinds of fruit crops included in the Kyrgyz Red Book (2006).

The *Forest Code No. 66 of the Kyrgyz Republic* of 8 July 1999 regulates the legal basis of protection and use of forest resources, including trees and plants. According to the *Forest Code*, forests have a nature-conservation status and commercial felling of trees is prohibited there. In accordance with the *Forest Code*, there are state, municipal and private forests. However, at present there are only state forests. In

accordance with Article 11 of the *Constitution of the Kyrgyz Republic*, approved by General Referendum of 27 June 2010, “Natural resources, water, minerals and forests are the exclusive property of the Kyrgyz Republic”, hence some of provisions of the *Forest Code* are subject to revision.

For conservation of the unique relic walnut and juniper forests, stabilization of the ecological situation law of Kyrgyz Republic (2007) prohibited the felling of trees, transportation, purchasing and selling, procurement and use, export and import of high-value (walnut and juniper) wood species in Kyrgyz Republic for a period of five years. In connection with the introduction of such a moratorium on felling of high valuable species in nut-bearing forests for fuel and other needs, people turned to cutting down undergrowth (apple, plum, alycha, maple and other related species of the second and third level). At present the issue of restoration of forest environment in nut-bearing forests of the Jalal-Abad region is being developed.

Article 57-1 of the *Forest Code* defines the list of high value tree species, which includes walnut (*Juglans regia*), Turkestan juniper (*Juniperus turkestanica*), Zeravshan juniper (*Juniperus seravschanica*), hemispherical juniper (*Juniperus semiglobosa*), pistachio (*Pistacia vera*), almond (*Amygdalus* sp.), and (with the active support of the UNEP-GEF project “*In situ/on farm conservation and use of agro-biodiversity (horticultural crops and wild fruit species) in Central Asia*”) coordinated by Bioversity International Kyrgyz apple (*Malus kirghisorum*) and sea buckthorn (*Hippophae rhamnoides*). It should be noted that within the framework of realization of this regional project, work was conducted on research and analysis of the regulatory framework, and invaluable experience was gained and high-level consultations, including international specialists on relevant areas, were held. As a result of this acquired knowledge and experience, there was an active participation in the development of the *Environmental Code of the Kyrgyz Republic*, the draft *Biodiversity Conservation Strategy* for the period 2011-2025, the draft *National Action Plan* for 2011-2014 and a number of other draft legislative acts.

The 2001 *Law of the Kyrgyz Republic On Protection and Use of Flora* regulates relations connected with protection and use of flora. This law provides regulations for use of flora (for livestock farming, beekeeping, harvesting, collecting, receiving, processing and sell of wild medicinal, technical and food raw materials), the procedures for recovery of damages, among others. There are no specific provisions for the regulation of wild relatives of fruit crops. Also the issue of access to genetic resources is not taken up.

According to regulations of the *Land Code of the Kyrgyz Republic*, the *Land Fund*, in accordance with its use target, is divided into following categories:

- agricultural lands (irrigated arable land, rainfed arable land, perennial stands, hayfields and pastures);
- settlement lands (cities, towns and villages);
- industrial, transportation, communication, defense and other purpose lands;
- specially protected natural area lands;

- forest reserve lands;
- water reserve lands; and
- reserve lands.

From the listed land reserves: agricultural, specially protected natural areas, forest, water reserve and reserve lands could be used effectively for the development of farming, dealing with conservation and multiplication of wild relatives of fruit crops.

Conclusions

In the country's environmental legislation there is no specific regulation aimed at conservation of genetic resources, although it does have regulations that provide indirect conservation of genetic resources. For example, it prevents SPNAs from introducing alien species, provides for obtainment of special permits for introduction of new species, the conservation of endemic species through creation of SPNAs, and others.

Legal documents provide no clear regulation on issues concerning access and benefit sharing in the process of using agricultural biodiversity. Specific legislation has been adopted for the protection of flora and the *Forest Code* allows for the implementation of concrete measures to promote fruit and nut species conservation.

Recommendations

It is important to develop sub-legislative acts (instructions, regulations, rules, etc.) for the effective and practical application of legal norms as laid out in formal legislative acts.

For instance, zoning regulations for the territories of state reserves is envisaged in the new edition of the *Law of the Republic of Kyrgyzstan On Specially Protected Natural Areas*, but these zoning regulations have not yet been developed. A system of buffer zones of state natural reserve has been defined; these are usually bordering on core zones and are used for scientific research, traditional types of activity with extensive economic aspects, including regulated use of agricultural holdings, implementation of ecological tourism, but there is no rule for using the territory use for stated purposes.

It should be noted that in recent years, with the increase in heads of livestock held by the population living near specially protected natural areas (SPNA), the need for pastures for cattle grazing and hayfields for storage of feed for winter has increased several times, but the norms on use of buffer zones and protected zones are absent, which creates difficulties for rational and effective solutions to the issues involved in providing the population with pastures and hayfields. Research should also be implemented on the development of norms for use of vegetation in buffer and protected zones of SPNA in collaboration with the National Academy of Sciences of the Republic of Kyrgyzstan.

In order to create a normative and legal basis for the conservation and use of fruit crops and wild fruit species, instructions and regulations should be developed to define the resources of wild fruit species, calculate and evaluate their numbers and value for the processing sector as well as for possible attraction of investments for their preservation, collection and processing of the harvest from wild fruit species growing in forests as well as in buffer and protected zones of SPNA.

The development of normative and legal acts with the aim of supporting the conservation and sustainable use of wild fruit species will increase the investment potential of this sector.

The improvement and rational, sustainable use of plant resources in buffer and protected zones of SPNA and in forests will lead to the identification of the methods not only for the protection of wild fruit species but also for helping to solve the issue of providing the local populations with plant products that are of importance for their livelihoods.

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TAJIKISTAN LEGISLATIVE FRAMEWORK FOR THE CONSERVATION AND USE OF AGRICULTURAL BIODIVERSITY

Samiev Tuychi

Introduction

Tajikistan has a rich diversity of flora and is recognized as one of the centers of origin and diversity of number of species of agricultural crops. A wide range of fruit crops such as apricot, peach, grape, apple, pear, persimmon, pomegranate are grown in Tajikistan. The great genetic diversity of these plants is recognized by the size, shape and color of fruits, ripening time, quality, etc. Varieties of these types of fruit crops were selected as a result of long-term traditional breeding.

Apricot is widely distributed throughout Tajikistan and grown from 300 m (Ayvadsh, Shahritus) to 3,000 m above sea level (Langar, Ishkoshim Districts). The main zone of cultivation of apricot is located in the northern districts of Tajikistan, mainly in Isfara, Kanibodom, and Ayni. The total area of apricot orchards is 24,400 ha, 93% of which (22,700 ha) is located in the Sughd region. Twelve volumes of the book “Flora of the Tajik SSR” (1957-1991) contain descriptions of a number of non-cultivated plants, their collection and use under natural conditions — for example, walnut, fruits of pistachio, wild apple, pear, sea buckthorn, grape, barberry, Anzur onions, rhubarb and cumin.

In the modern stage of social development it is necessary to understand the value of the agricultural biodiversity surrounding us. This agricultural biodiversity should be conserved for future generations not only for its aesthetic, educational and cultural values, but also for economic and scientific purposes, as it is necessary for further social development.

First of all, it is necessary to clarify the definition of “agro-biodiversity”: it is the diversity of living organisms, both flora and fauna, in all its forms and its habitats.

In accordance with the *Convention on Biological Diversity* (1997), “biological diversity” is the variability of living organisms in all ecosystems, including land, sea and fresh water and the ecological complexes of which they are all part. Biodiversity can be intraspecific, interspecific and at the level of ecosystems.

In this legislative analysis, agricultural biodiversity issues, namely legal regulation of the status and protection of wild fruit crops and their cultivated relatives, will be covered. The analysis gives special consideration to the legislation that conserves and protects wild plants because they are more exposed to negative human impact, such as deforestation and irrational use, as a result of which the wild relatives need more protection by the Government than do the cultivated varieties.

Generally, rules of law regulating and protecting wild fruit crops are not mentioned in separate legal acts. There is no clear limit for regulation and protection of fruit and non-fruit crops. Moreover, the legislation is more oriented to regulation of such domains as land management and, as a consequence, the plants existing on the land are only indirectly regulated objects.

National legislation on habitats conservation

Land relations are regulated by the *Constitution*, the 1994 *Land Code* and other legal instruments of the Republic of Tajikistan. Land in Tajikistan is the exclusive property of the state and the state guarantees its effective use in the interests of the people. Claiming land that formerly belonged to one's ancestors is not allowed. All lands comprise a single state land fund and in accordance with the purpose of the following categories: (according to the *Law No. 357 of 5 January 2008 On Amendments and Additions to the Land Code of the Republic of Tajikistan*)

- a. agricultural land;
- b. land for settlements (towns, townships, and rural settlements);
- c. land for industry, transport, communications, defense and other purposes;
- d. land for conservation, spas, recreation, historical and cultural purposes;
- e. land of the State Forest Reserve;
- f. land of the State Water Reserve; and
- g. state land reserve.

Lifetime inheritable land is made available to individuals or groups of individuals for the purpose of organizing *dekhkan* (farming) enterprises and traditional trades as well as to citizens as homestead land.

The state land planning authority and its local branches registers rights to land use of individuals and legal entities with available land plots. Documents that certify the right to land use are processed and issued in line with Article 17 of the present Code. The right of individuals and legal persons to use the land comes into effect at the moment of receipt of documents certifying the right to land use that have passed state registration.

The 1994 *Land Code* of the Republic of Tajikistan (Article 88) also includes lands of state nature reserves, national parks, state wildlife sanctuaries, national parks, natural

monuments, parks dendrology parks, botanical gardens, and spas and resorts that conform to Specially Protected Natural Areas.

Specially Protected Natural Areas (SPNA)

Tajikistan participates in a range of international agreements and processes under which a system of specially protected areas has been developed in the country. In this sphere, the most important international mechanisms are:

- *Convention on Biological Diversity*, which was signed by the Republic of Tajikistan in 1997. In accordance with this Convention (Article 8) each of the Agreed Parties should create a system of protected areas or regions in which special measures for conservation of biological diversity must be taken.
- *Convention on Protection of World Cultural and Natural Heritage*, signed in 1992.

The Articles 1 and 2 of this latter Convention dictate that a Member State - an agreed party of this Convention — admits the obligation to identify, protect and propagate the cultural and natural heritage existing in its territory in order to ensure them for future generations. For this purpose, it acts based on its own resources and, if necessary, through international assistance and cooperation, namely in financial, artistic, scientific and technical relations.

In addition, the framework of implementation of mutual cooperation between the Republic of Tajikistan and neighboring or other countries in the environmental sphere requires joint activities on the development of the system of specially protected natural areas. As examples of this, the following activities can be enumerated:

- agreement between Governments of the Republic of Kazakhstan, Kyrgyz Republic and the Republic of Uzbekistan on cooperation in the domain of environmental protection and rational use of the environment (Dushanbe, November 20, 1998); and
- agreement between the countries of CIS (the Republic of Azerbaijan, the Republic of Armenia, the Republic of Belarus, Georgia, the Republic of Kazakhstan, Kyrgyz Republic, the Republic of Moldavia, the Russian Federation, Turkmenistan, the Republic of Uzbekistan, Ukraine) on information exchange and cooperation in the sphere of ecology and environment protection.

Following international agreements on protected areas, Tajikistan has adopted very recently the *Law of the Republic of Tajikistan No. 241 of 15 December 2011 On Specially Protected Natural Areas*. This Law determines the legal, administrative and economic basis of specially protected territories. It also determines the objectives, mode of activities and zoning of the specially protected areas. According to the Law, specially protected areas are the land territories, water bodies and air space above the territories where natural complexes and objects are located that have specially protected status due to their scientific, cultural, aesthetic, recreational and health value. In accordance with the legislation of the Republic of Tajikistan, these territories are fully or partly withdrawn from business use and a special protection system is applied in these areas.

The following categories of specially protected natural areas are of great importance for fruit crop diversity conservation:

- *state nature reserves*: refers to the land territory or water area fully withdrawn from economic use and intended for conservation and research on typical and unique nature complexes, gene pools of plants and animals, monitoring of dynamics of natural processes and phenomenon;
- *state natural parks*: these are territories that include natural complexes with specific environmental, historical or aesthetic value, intended for use in nature protection, recreation, or for scientific and cultural purposes;
- *natural refugiums*: these are territories allocated for a certain period with the purpose of protecting or restoring certain components of nature and natural complexes;
- *biosphere reserves*: these are plots of land or water ecosystems or a combination of the two that are included in a global network of biosphere reserves and are intended for conservation of natural and cultural values and sustainable land use, including lands of agricultural purposes, forest funds, specially protected natural areas, and rural settlements;
- *dendrological parks and botanical gardens*: these are institutions whose task is to create collections of trees and shrubs in order to conserve biodiversity and enrich associated flora, introduce and acclimatize new species of plants, as well as for scientific, educational, and cultural/educational purposes.

Specially protected natural areas are the particular property of the state, and the state guarantees their rational use in the interests of the people. In addition, actions that directly or indirectly violate the right of state ownership on specially protected natural areas are prohibited.

A state cadastre of specially protected natural areas is being maintained and includes data on legal status, geographical location, quantitative and qualitative characteristics of ecological, economic, scientific, educational and other values of protected natural areas and their users. The state cadastre's objective is to assess the state of the environment, identify development objectives, provide protection of the environment, conduct scientific research, maintain state control of gene pool conservation and comply with appropriate legal regimes, as well as assess all of these areas and ensure their inclusion in the planning of socio-economic development and the allocation of productive forces in the region.

The new law also recognizes that planning measures on the protection and use of specially protected natural areas should be included in the concepts, strategies and programmes of socio-economic development. These measures will be implemented with consideration of a scientifically-based combination of economic and environmental interests of the public. Specially protected natural areas are taken into account during the development of programmes for socio-economic development and in schemes of land utilization and district planning, on the basis of the state ecological programme,

and the general scheme of development and allocation of productive forces, with consideration of the natural resource potential of the republic and its individual regions.

In relation to the legal status of the lands dedicated to specially protected natural areas, they belong to the category of lands of the State Forest Reserve of significance for environmental health, human health, recreation and historical and cultural value. On these lands any activities contradicting their intended purpose are prohibited. The reservation of land plots for the organization of specially protected natural areas is determined by resolution of chairmen of cities and districts on the basis of joint proposals of authorized state agencies and authorized research institutions. In these cases, land users are compensated in accordance with legislation of the Republic of Tajikistan. The reorganization, suspension of functioning and liquidation of these natural protected areas is determined by decision of the Government of the Republic of Tajikistan and local government authorities according to the proposal of an authorized state body.

Among the different categories of protected areas, *state nature reserves* play a significant role in the protection of fruit crop diversity. State nature reserves have as their main objective the conservation of biological diversity through: maintaining all natural reserve ecosystems in their natural state; carrying out biological monitoring; carrying out scientific research; and the dissemination of ecological knowledge, among others.

State nature reserves are created by the Government of the Republic of Tajikistan upon the proposal by an authorized state body and through agreement with local government authorities. Their organization does not require the consent of individuals and juridical entities engaged in economic activities and nature management in the given area; their management is the responsibility of authorized government agencies. Their management plans are approved by authorized government agencies following consultations with other relevant state organs, public organizations and citizens.

Land, water, subsoil, flora and fauna of the territory of state nature reserves are transferred in full and without compensation to reserves for permanent use. Lease of land and other natural resource reserves is prohibited. On the territory of the state nature reserves it is prohibited to engage in economic and other activities that violate the development of natural processes, threaten the natural ecosystems and biomes, and are not connected with implementation of tasks assigned to the reserve. In particular, the introduction of plants and animals not typical to these areas is strictly prohibited in their territories or in their buffer zones.

Another important category is *state natural parks*, which may have both national and local significance. The decision to establish a national park and the approval of their funding are made by the Government of the Republic of Tajikistan based on the proposal of an authorized state body. Natural parks of local significance are

established by local government authorities based on proposals of authorized state bodies.

Additionally, state nature reserves can be nominated for inclusion in the *UNESCO Global Network of Biosphere Reserves*. *Biosphere reserves* are intended for the conservation of natural and cultural values and for sustainable land use. They include agricultural lands and therefore can be of great relevance for the conservation of agricultural biodiversity. These areas have a recognized international status. The Government of the Republic of Tajikistan will make a decision on nomination for reserve status based on the joint proposal of an authorized state agency and an authorized state research institution.

Different functional zones can be established on the territory of a biosphere reserve according to the level of protection required:

- a. central (core) zone with a strict protection regime, assigned exclusively for conservation of biological and landscape diversity and creation of conditions for the development of biogeocenosis. In this zone, any economic activity is prohibited with the exception of research activities and monitoring of natural processes;
- b. protected zone, which is part of the territory that usually surrounds the central zone or is contiguous with it and used for implementing environmentally-safe activities, including environmental education, recreation, ecotourism, and also scientific research; and
- c. transition (buffer) zone, which is the part of the territory belonging to other land users and utilized for environment-oriented activities that do not damage ecosystems and components of the specially protected natural areas.

The new *Law On Specially Protected Areas* also creates the concept of *nature refugiums* that can be privately owned when they are of local significance and can be an important tool for agricultural biodiversity conservation in the future. These nature refugiums can be declared for conservation and restoration of valuable landscapes and ecosystems and for the conservation and restoration of valuable, rare and endangered species of plants and animals, among others. In these cases, land territories can be declared state nature refuges without withdrawal of lands from land users.

Finally, the law also includes the concept of *interstate natural parks and reserves* that are established in accordance with interstate agreements of the Republic of Tajikistan. These offer a great opportunity to protect at the regional level forests that are rich in wild fruit species and are shared among Central Asian countries.

Forest legislation

The new *Forest Code of the Republic of Tajikistan*, Law No. 209, was adopted on 21 July 2011. A forest is considered a complex of natural plants, which is formed in both natural and artificial ways in a specific area and based on a population of trees and

bushes (not less than 10 percent of the territory covered by trees, not less than 0.5 ha land area and not less than 10 meters in width), interacting with other components of the ecosystem and having important environmental, economic and social value.

Legally recognized forests include the common forest reserve of the Republic of Tajikistan, as well as the lands of the state forest reserve, lands not covered with the woods, forest resources and useful characteristics of forests regardless of the land user. The objects of the forest legal regulations are used and protected with consideration of the multifunctional significance of forests as well as their role as the main capital goods in forestry.

For the first time, the *Code* encompasses under forest regulation the concept of biological diversity as the sum of living organisms, including intraspecific, interspecific and between-ecosystems diversity. In addition, the *Code* considers *state forest nature reserves* as the forest territories that are removed from economic activities and intended for the protection of animals, plants and the whole natural ecosystem, including rare and endangered species of flora and fauna, and also for the purpose of studying natural processes, phenomena and the development of a scientific base for nature protection within these territories.

The *Forest Code* includes the establishment of plantations for the purpose of the production of timber and other types of forest products (medicinal plants, fruits, etc.) and forest nurseries in state forest reserves for the cultivation of quality planting materials of wood and bush species of local origin.

With regard to forest conservation, the 2011 *Forest Code* identifies a number of violations that can be sanctioned and compensated. Physical and legal entities are obliged to compensate the damages to forest and hunting reserves, according to the rules established by the Government of the Republic of Tajikistan.

Among the types of violations of legislation in the domain of forestry are:

- illegal felling of forests, excavation, destruction or damaging of forest trees and bushes;
- destruction or damaging of seeds or seedlings in forests and nurseries;
- intentional destruction or damage of forest reserves through arson and violation of preventive fire-fighting regulations in the forest;
- damaging hay and fodder plants on the lands of a forest reserve;
- haying and grazing in the territory of a forest reserve without permission;
- collection and processing of wild food, medicinal fruits, plants and other resources without permission;
- destruction of warning and caution signs in the territory of state forest reserves;
- illegal capture, damage to, destruction of nests of birds and habitats of wild animals;
- damaging and polluting forest reserves with waste water, chemical wastes, industrial and municipal wastes that lead to destruction or disease of forest trees;

- destruction of useful forest fauna; and
- appropriation of lands of forest reserves without permission.

National legislation on species conservation

Wild species conservation

The *Law On Conservation and Use of Flora* of 2004 sets forth principles for public policy of the Republic of Tajikistan in the field of conservation and sustainable use of flora. It also defines legal, economic and social frameworks in this area, and is aimed at the conservation and regeneration of plant resources.

In situ conservation of wild species and wild crop relatives for different uses is considered one of the most important and priority areas of the National Programme on Biodiversity and Biosafety. The programme provides guidance and plans to expand protected areas to preserve their valuable biodiversity, reduce the risk to biodiversity by raising public awareness, including endangered plant species in *ex situ* conservation and re-introducing these into the wild. However, currently there are serious problems in this area.

The *Red Data Book of the USSR*, published in 1978 by the Ministry of Agriculture of the USSR, includes more than 440 rare and endangered species, from which there are around 30 in Tajikistan. However, this book does not include many species, such as decorative tulips, *shiryavshi* (*Eremurus*), irises, wild endemic *Astragalus*, *Oxytropis* primroses, Akantoli Moni, Cousinia and others in need of protection.

Destruction of wild relatives of cultivated plants is carried out usually with the purpose of gaining economic profit. For example, local populations in springtime in the mountains collect rhubarb, and in autumn Anzur onions to sell for income.

In recent years, *Ferula* has received wide popularity among easy profit-seekers, and has seen slackening of control cause significant damage to populations of this plant. It was found that the juice extracted from this plant has medicinal properties and is highly valued. People began to collect the *Ferula* plant for export, which was followed by its large scale destruction and led to the risk of full extinction. Considering this situation, the President of the Republic of Tajikistan Emomali Rahmon on 19 September 2008 issued a decree *On Explicit Prohibition of Collection and Export of Gum of Ferula*. The decree also addresses the issue of expansion of cultivated areas for growing *Ferula* in appropriate regions of the country.

Raising public awareness, involvement of local people and farmers in *in situ* conservation as well as enforcement of legislative documents and decisions adopted by the Government will all help address existing problems.

In particular, Tajikistan is very rich in diversity of wild medicinal species but only a small part of them is in use. The forestry enterprises and the Ministry of Health are engaged in the preparing and processing of wild medicinal plants. The *Law of the Republic of Tajikistan On Medicines and Pharmaceutical Activity* was adopted on 28 June 2001. This law defines the legal basis of government policy in the area of circulation of medicines, medical commodities, and pharmaceutical activity.

Pharmaceutical organizations refer to enterprises and institutions engaged in import, export, storage, processing, manufacturing, quality control, efficiency, safety, trade of medications and medical supplies as well as in the procurement and processing of medicinal raw materials and cultivation of medicinal plants, collection, analysis and provision of information on pharmaceutical activities, medicines and medical supplies. These include pharmaceutical companies (plants, factories) and pharmaceutical institutions, specialized laboratories, enterprises dealing with development of medicines, wholesalers, and business entities engaged in procurement and processing of medicinal plants.

Wild plant resources of the Republic of Tajikistan have not yet been studied thoroughly. Rational use of wild plants is of great significance. In this regard, wild plants have important medical characteristics and are used widely in modern medicine and food industry. The State Programme on Growing, Harvesting, and Processing Medicinal Plants and Producing Medicines Using These Plants for 2005-2014 was developed and adopted by Decree No. 170 of the Government of the Republic of Tajikistan of 10 May 2005. The main tasks of this programme are:

- implementation of laws of the Republic of Tajikistan *On Conservation and Use of Flora* and *On Medicines and Pharmaceutical Activity*;
- sowing seeds and planting young plants of wild medicinal plants;
- implementation of erosion-preventive measures and improvement of pasture lands;
- education of population on methods and ways of cultivation, collection and processing of wild medicinal plants with involvement of local and foreign specialists;
- production of medicinal and food preparations from wild medicinal plants;
- decreasing imports of chemical medications from abroad to the Republic of Tajikistan;
- providing 15,000 jobs and through this improving the social condition of local populations;
- development of guidelines on collection and processing of medicinal plants, establishment of their plantations, conducting environmental educational activities among the population;
- conducting research on identification of reserves of wild medicinal plants and methods of restoration to protect them from disappearing; and
- attracting investors to the area of cultivation, collection, processing of wild medicinal plants and production of medications on a contractual basis.

The Republic of Tajikistan cooperates internationally in the area of the creation, production, quality control and trade of medicines. For this purpose the country is

developing and implementing international research programmes, exchange of information, advanced methods and technologies for the creation and production of medications, import and export, professional and scientific contacts and contacts with healthcare workers.

The state develops and supports all forms of international cooperation concerning the creation, production, quality control and sale of medication that are not contrary to the laws of the Republic of Tajikistan.

Fruit crop species conservation

Horticulture and viticulture as key areas of the country's agro-industrial complex play a major role in providing the population with food, improving the welfare of the people and providing able-bodied rural populations with jobs. According to the statistics of 1990, the total area devoted to orchards amounted to 77,100 hectares and that of vineyards to 37,100 hectares in all categories of farms in the country.

Unfortunately, over the last 10-12 years, for various reasons (lack of mechanization and high depreciation, rising prices for fuel and lubricants, fertilizers, pesticides, etc.), under new market economy conditions certain difficulties were caused for producers. Part of the orchards and vineyards, especially in rain-fed lands, began declining due to a failure to ensure inter-row tillage and anti-theft reinforced concrete poles and wires for grapevines. As a result, the total area of orchards and vineyards and their yields reduced each year. In 2002, the area of the orchards amounted to 77,022 hectares and of vineyards to 35,988 hectares throughout the country.

A Programme on Rehabilitation and Further Development of Horticulture and Viticulture in the Republic of Tajikistan 2005 – 2010, approved by Governmental Decree No. 499 of the Republic of Tajikistan on 31 December 2004, was adopted based on an analysis of the current state of horticulture and viticulture in all categories of farms in order to implement the tasks in the field of horticulture and viticulture indicated in the *Programme of Economic Development of the Republic of Tajikistan for the Period until 2015*.

Replacing the old orchards of apricot, apple, pear, cherry, mulberry, and of vineyards traditionally cultivated for centuries may lead to a loss of genetic diversity of fruit crops. In this context, Bioversity International implemented the international *Project In Situ/on Farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia* to assess and prevent the further erosion of breeds and varieties of fruit crops and promote their conservation in partnership with the Tajik Institute of Horticulture. Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan participated in the implementation of the project.

The duration of the project, funded by the Global Environment Facility (GEF), was from 2006 to 2012 and the United Nations Environment Programme (UNEP) provided

technical support. The main objective of the project was to study the conservation status of the local diversity of fruit crops and wild fruit species, reveal the varieties and forms with economically valuable traits and adapted to local environment, multiply and disseminate planting material of this valuable genepool among the farmers, provide breeders with access to this germplasm for development of new high-yielding and resistant varieties, increase the area of orchards and vineyards, increase the yield of fruit crops and vineyards, and, ultimately, increase production of fruits, nuts and grapes.

The *Programme on Rehabilitation and Further Development of Horticulture and Viticulture in the Republic of Tajikistan 2005-2010*, approved by Governmental Decree No. 499 of the Republic of Tajikistan on 31 December 2004, was launched and gave an impetus to the industry. In 2005-2006, the country started new orchards and vineyards in an area of 7,700 hectares and restored 3,400 hectares of vineyards. During this period, 4.1 million fruit-bearing and 5.5 million evergreen plants were planted.

The current development status of the Republic of Tajikistan and the improvement of the environmental situation in the country necessitated the development and adoption of a new programme. In this regard, the Government of the Republic of Tajikistan approved the *Earmarked State Programme of Horticulture and Viticulture Industries Development for the Gradual Increase in the Production of Fruit and Grapes, Fruit Seedlings and Evergreen Plantings in the Republic of Tajikistan for 2007-2010* on 6 April 2007, Law No. 194. The main objective of the programme is to restore old orchards, replace low-yielding and low-quality varieties with new high-yielding varieties that meet the requirements of a market economy, expand orchards and vineyards by planting new ones, increase the yield of fruit crops and vineyards through propagation of seeds and seedlings, increase the number of ornamental and evergreen trees, and, ultimately, increase croppage of fruits and grapes and achieve overall development of the country. Further development of the horticulture and viticulture industry and the cultivation of seedlings of shade and evergreen plants should not only meet the needs of the population of the republic in the future for fresh fruits and grapes and landscaping, but also turn it into a powerful agricultural industry capable of producing products of high quality and, thus, ensure access to external markets and contribute to the solution of socio-economic issues in rural areas.

In recent years, virtually no agro-technical measures, especially chemical treatment of orchards and vineyards against diseases and pests that cause sizeable damage to the industry, have been taken. Therefore, a *Programme for the Protection of Orchards and Vineyards from Pests and Diseases in the Republic of Tajikistan* was approved by the Government of the Republic of Tajikistan on 4 July 2006, Law No. 290. The main objective of the programme is to increase productivity and croppage of fruit and grapes of high quality by means of implementing integrated pest control to protect orchards and vineyards.

Conclusions

Among these laws and regulations, of the greatest importance for the conservation of genetic resources is the 2004 *Law of the Republic of Tajikistan On the Conservation and Use of Flora*, which reinforces the principles of state policy in the field of environmental protection and efficient use of flora, defines the legal, economic and social bases for the domain and aims at conservation of plant resources. The law passed in 2004, but bylaws and other regulations that help effective implementation of the law have not yet been drafted or adopted. Obviously, this prevents the application of the law.

Considering the important medicinal properties and wide use of wild plants in modern medicine and the food industry, a *State Programme on Growing, Harvesting, and Processing Medicinal Plants and Producing Medicines Using These Plants for 2005-2014*, was developed and approved by the Decree of the Government of the Republic of Tajikistan on 10 May 2005, No.170. The programme is designed to assist in the successful application of the *Law of the Republic of Tajikistan On Protection and Use of Flora* of 2004 and *On Medicines and Pharmaceutical Activity* of 2001.

Although Tajikistan's legislation on nature conservation upholds the preservation of biodiversity and Tajikistan is a signatory to the *Convention on Biological Diversity*, the system of practical measures to protect rare and endangered animals and plants is not well developed. Forest authorities and forest companies usually do not have a programme for inventory and conservation of genetic resources. They recruit very few professionals able to assess the negative impact of economic activities on genetic resources.

The Republic of Tajikistan has signed several international treaties and agreements on conservation of plant genetic resources. In addition to the *Convention on Biological Diversity* (1997), one of the most important international documents signed by the Government of the Republic of Tajikistan is the *Convention Concerning the Protection of the World Cultural Heritage* (1992). Joint actions are also planned within the framework of multilateral cooperation between the Republic of Tajikistan and other countries. However, the procedure for the protection of wild relatives of crop plants grown in Tajikistan is not governed in a separate statute or other legal document. In this regard, there is a need to improve the legal framework concerning the conservation and efficient use of plant genetic resources.

Recommendations

General proposals

In analyzing general propositions on improving the legal regulation of biodiversity, it is necessary to note that ideal laws do not exist. However, full implementation of existing legislation would cover for the most part the problems of biodiversity conservation.

For improvement of *in situ* conservation of wild crop relatives, first of all political measures should be adopted. These include activities related to the improvement of the legal framework for protection of genetic resources. The practice of entering the endangered species into the *Red Data Book* will not have a positive effect if specific measures for each specific cases are not adopted. Therefore, all actions leading to disappearance of valuable species of wild plants should be punished. It is clear that due to deterioration socio-economic living conditions, the population started to cut down trees, shrubs and collect plants in order to survive. Therefore, it is necessary to take measures to find alternative sources of fuel and food. The Government of Tajikistan is taking steps to increase production of coal, as the country has sufficient reserves of this fossil fuel. Large and small hydro-power plants are being constructed at the moment. In order to promote the interest of farmers in increasing food production, potato and wheat seed materials are provided.

Another common issue throughout the Republic of Tajikistan is low public awareness and weak introduction of information technologies in the domain of biodiversity.

Proposals on SPNA

Although a harmonization of regulations on natural reserves and wildlife preserves in accordance with international framework requirements has been realized through the new *Law On Protected Areas*, the consolidation of the whole system is needed at the implementation level.

Among other issues, the following should be considered for the development of the natural protected areas system:

- the consolidation of buffer zones of state natural reserves and extension of territories of specially protected natural areas;
- organization of transboundary natural parks and reorganization of specially protected areas according to their ecological status and importance;
- restoration of research in natural reserves and wildlife preserves;
- conducting of forest and land management activities every ten years;
- elaboration of recommendations on development and goal-oriented use of specially protected areas;
- creation of a database on specially protected natural areas;
- publication of scientific books and brochures on specially protected natural areas of the Republic of Tajikistan; and
- strengthening of public awareness on ecological issues through mass media.

In general, the structure of the network of specially protected natural areas of the country is better adapted to the protection of fauna than the protection of flora. Thus for effective conservation of flora and biodiversity, it is necessary to seek new forms and ways of territorial protection.

Proposals for conserving fruit crops and their wild relatives

For conservation of wild plants, fruit crops and forest species, it is necessary to maintain a systematic information database containing information on quantity and quality characteristics of all species of plants. Currently, such information exists, but is not systematized and is in uncoordinated condition.

There is a need to develop large-scale projects on collecting and propagation of endangered species and their re-introduction. There is also a need for assistance from international and regional organizations on staff training and retraining.

The development of agriculture is closely related to breeding new varieties and their broad cultivation. However, conservation of the diversity of local crops and plants within their habitats is also crucial. There is a need to take measures for their regeneration and propagation in order to expand markets for these plants. It is essential to motivate and support initiatives of farmers who grow these crops. On the other hand, specific varieties, especially those of fruit crops, are grown in special zones. It is therefore crucial to support and develop infrastructure and build fruit and berry processing plants in their vicinity. Infrastructure development, especially road construction, is at full force in Tajikistan. This enables farmers from remote districts to deliver and sell fruit and berries of local varieties – Murud and Amrud varieties of pears, Huboni and Husni Yusuf varieties of apple, Husaini and Chillagi varieties of grapes, as well as figs, pistachios, nuts, and other fruits, in district capitals. Free economic zones and local markets are being established in areas bordering Afghanistan to greatly benefit the population residing on both sides of the Panj River. It is very likely that a great diversity of local varieties will be sold at these markets.

A draft law of the Republic of Tajikistan *On Conservation of Genetic Resources of Cultivated Plants and Their Sustainable Use* has been developed and submitted for consideration to the lower house of the *Majlisi namoyandagon* of the *Majlisi Oli* of the Republic of Tajikistan.

In relation to wild genetic resources that are present in *dekhkan* farms, it is necessary to:

- develop a mechanism for protection of wild fruit trees if they exist on land plots provided to *dekhkan* farms;
- specify the rights and responsibilities of *dekhkan* farms regarding wild fruit crops;
- develop rules for possible transplantation of wild fruit crops to other territories, or exchange and withdrawal of land plots where wild fruit crops exist;
- as *dekhkan* farms in the Republic of Tajikistan are mostly located in rural areas, which are remote from urban and regional centers and from authorities, it is necessary to develop a mechanism for possible monitoring of the status of wild fruit plants located in their territories;
- develop ways of informing the public and raising the awareness and responsibility of members of *dekhkan* farms on need for biodiversity conservation; and

- legally impose the responsibility of associations of *dekhkan* farms or of individual *dekhkan* farms for conducting inventories of fruit crops located in plots of *dekhkan* farms.

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TURKMENISTAN LEGISLATION ON CONSERVATION OF WILD RELATIVES OF HORTICULTURAL CROPS IN SPECIALLY PROTECTED AREAS AND FOREST LANDS

Kamakhina Galina

Introduction

In Turkmenistan, especially in the mountainous areas, wild relatives of 172 cultivated plants from the Central Asian genetic center of origin have been maintained. The tree and shrub group of crop wild relatives consists of more than 40 species. Forest plants are valuable as the genetic resource of such food crops as apple (*Malus* spp.), pear (*Pyrus* spp.), plum (*Prunus* spp.), pomegranate (*Punica granatum*), grape (*Vitis* spp.), barberries (*Berberis* spp.) and others, or as sources of wild nuts for local communities: pistachio (*Pistacia vera*), almond (*Amygdalus* spp.) and walnut (*Juglans regia*).

Turkmen apple, an endemic subspecies of Sievers apple (*Malus sieversii* ssp. *turkmenorum*), grows in rather small local plots (in gorges) of the Western Kopetdag and near the Central Kopetdag territories without forming large clusters of trees. The cultivated forms of the Turkmen apple (Turush, Okcha, Yuvan, Kizilcha, among others) comprise the pool of old local varieties that are famous under the name “babarab” apple. From the time of the Parthian kingdom in Kopetdag, wild residues remain of cultivated varieties of grape, which originated from wild *Vitis sylvestris*, which has also been found today growing wild in the mountains of the southwestern Kopetdag. Wild pomegranate (*Punica granatum* L.) was found in the gorges of Syunt-Khasardag, Chandir and Palizan Ranges and in valleys of the Sumbar River and the Shevlan, Narli, Karayalchi gorges.

Pistachio (*Pistacia vera*) is encountered as individual trees or small groves on foothills of the eastern (Fistashkovi, Khodja and Divenyuk gorges), central (Kutrusu, Leser Guncha and the foothills of Tekechengasi), and southwestern (Akkaya, Arpaklen, Gebesaud, Guyun) Kopetdag. The main area of pistachio is located in Badkhiz and Karabilya near Meruchak and on the right bank of the Kugitangdarya. Unique fruit genetic resources of high commercial value strongly require more research, collection and conservation. However, many wild relatives of fruit crops are not provided with

optimal conditions for their conservation and normal development *in situ* as well as *ex situ*. Many local varieties of fruit crops are grown in home gardens by smallholder farmers, but they have a low competitiveness in the market. The conservation of local genetic resources of fruit crops should be the priority of national legislation.

National legal framework for fruit genetic resources conservation

Of great significance is the work of a number of international agreements and organizations, institutions and programme initiatives in the area of the conservation of genetic material of fruit crops. Turkmenistan has ratified several important international agreements, such as the *Framework Convention on Climate Change* (1995), the *Kyoto Protocol* (1998), the *Convention on Biodiversity* (1996), the *Cartagena Protocol* (2008), the *Convention to Combat Desertification* (1996), the *Aarhus Convention on Access to Information, Participation of the Public in Decision-Making Processes and Access to Justice on Environmental Matters* (1999), the *Ramsar Convention on Wetlands of International Value* (2009), and the *UNESCO Convention for the Safeguarding of Intangible Cultural Heritage* (2012), among others.

In relation to agricultural biodiversity, the *Convention on Biological Diversity* pays special attention to the “sustainable regulation of agricultural biodiversity through efforts of farmers and their communities,” which is one of the important conditions for provision of systematic food production and stability of ecosystems as well as natural resources.

At the regional level, the long-term regional aims of sustainable development of mountainous areas are fixed in the *Regional Strategy and Action Plan on Sustainable Development of Mountainous Areas of Central Asia* (2002). A Memorandum of Mutual Cooperation between Turkmenistan and Turkey in the field of forestry was signed in 1997. The Turkish company Finturi Ltd., in cooperation with *Gyok-gushak* (Forest Enterprise Association in Turkmenistan), developed a complex program of forestry development in Turkmenistan for the period 2001-2005, in which the conservation of forest crops, in particular pistachio, played a key role.

At the national level, several strategic documents have been developed on biodiversity conservation in the form of a *National Environment Protection Action Plan by the President of Turkmenistan* (NEAP, 2002) and a *Biodiversity Strategy and Action Plan* (BSAP) in 2001. The highest priority tasks of the National Biodiversity Strategy are reflected in such documents as *Evaluation of potential for the realization of global environmental UN conventions* (2006), *Monitoring and evaluation of fulfilment effectiveness of the strategy and action plan for biodiversity conservation* (2008) and in 2006 and 2009 national reports on the *Convention on Biological Diversity* implementation at the national level. In accordance with the draft document *Capacity Building Strategy for UN Global Ecological Conventions Implementation* (2007),

the Ministry of Nature Protection suggested measures to strengthen the national ecological normative and legal capacity in the conservation of biodiversity and in combating desertification.

Turkmenistan has not joined yet the CITES (the *Convention on International Trade in Endangered Species of Wild Fauna and Flora*, also known as the Washington Convention, 1975), although it shares their aims. The country's normative and legal framework, in particular the *Customs Code* of Turkmenistan, wholly agrees with the principles of CITES prohibiting transference of species entered in the Red Data Book of Turkmenistan and their derivatives, including wild relatives of fruit crops.

The main national normative and legal documents supporting the conservation of wild relatives of fruit and nut crops on specially protected natural areas and forest lands are the laws *On Nature Protection* (1991), *On Specially Protected Natural Areas* (2012), *On State Ecological Expertise* (1995), *On Flora* (2012), *Forest Code* (1993), as well as the *Regulation of Red Data Book* (1997) and *Regulation on the State Reserve of Nature Protection* (1996). The publication of the *Red Data Book* (1985, 1999 and 2011) became documentation on the conservation and restoration of populations of species of plants and animals that are rare and under the threat of disappearance. All plant genetic resources of specially protected natural areas of the country are the property of the state.

Legislation on Specially Protected Natural Areas (SPNA)

The main key legal act regulating organization and functioning of SPNA is the new *Law On Specially Protected Natural Areas* that was approved on 31 March 2012 and modifies the previous *Law On State Specially Protected Natural Territories* (1992) and the general *Law On Nature Protection* (1991) that defines the basis for environmental protection.

The SPNA framework is completed with a number of regulations that concretize the status and regime of reserves and other protected areas and were submitted after the approval of the first 1992 national law on protected areas, as well as with decisions submitted on the matter at the local level. These include the 1995 *Model regulation on state reserves of Turkmenistan*, *Model regulation on state partial reserves*, *Model regulation on protected areas of state reserves of Turkmenistan*, *Model regulation on state natural monuments in Turkmenistan*, *Model regulation on state nurseries of rare and vulnerable species of animals and plants of Turkmenistan*; in 1996 the *Regulation on state reserves of nature protection of Turkmenistan*; and in 1997 the *Regulation on Red Data Book of Turkmenistan*.

A liability system is contemplated by administrative regulations to establish a list of rates for damage recovery and similar claims to strengthen the natural protected areas system. In addition, regulations were created in 2000 to determine collection rates to be paid for animal and plant export permits and for the use of other services from

protected territories (2000). Specific regulations adopted by Presidential Decrees *On Measures for Conservation and Use of Karlyuk Caves and Other Natural Features of Animals and Plants of the Kugitan Mountains of Charshangin in the Lebap Region* (1992) strengthen the legislative framework on nature protection in the country.

SPNA are defined as natural plots of land, natural complexes and separate landforms having special ecological, scientific, cultural, cognitive, recreational and sanitary or esthetic values and are taken under special protection of the government. Specially protected natural areas are categorized as state reserves, natural and historical natural parks, refugiums, geological monuments of nature, botanical and zoological gardens and arboretums. Other categories of specially protected natural areas and features are included in the decisions of local authorities.

The acting legislative framework on nature protection is mainly aimed at establishing the conditions for the conservation of the biological diversity of the country, as well as providing protection for the potential of wild relatives of fruit crops in the forest ecosystems of Kopetdag, Syunt-Khasardag, Badkhiz and Koytendag Reserves. The total area of SPNA in Turkmenistan (eight reserves, 14 refugiums and two natural botanical nature monuments) is almost 4% (or 1,916,020 ha) of the territory of the country where 80% of the national biodiversity is maintained. Reserves of Turkmenistan are free from land taxes.

The new *Law On Specially Protected Natural Areas*, which was adopted by the Mejlis of Turkmenistan on 31 March 2012 has become the key legal act that governs the issues of organization and functioning of the SPNA and entered into force on 13 April 2012 after its publication. The adopted new law on SPNA (Article 4 and Articles 54-55) recognized SPNAs at the state level as national and indivisible property of Turkmen people. The legal basis of the Law is consistent with international standards, and at the national level, with the existing provisions of the land, water, forest legislation, legislation on other natural resources, and bylaws in force in the country. The new law extended the scope of regulations from the “conservation of natural complexes and individual objects” to “regulating all relations related to the organization, management, protection and use of SPNA”. For the first time the new law also includes one of the principles of public policy – “paid SPNA use” (Article 3, paragraph 4).

The Law has created a favorable environment for the functioning of national parks (Article 5, paragraph 2, and Articles 29-33) and local reserves. In accordance with the level of protection within national parks and reserves, economic activities of different degrees are allowed (i.e. tourism and other forms of recreation, traditional land use, agricultural and forest management activities) if they ensure a sustainable use of natural resources. Moreover, the land under SPNA “is provided for possession and use free of charge in accordance with the *Land Code* of Turkmenistan” (Article 7, paragraph 8).

The Law clearly describes the mechanisms for public organizations' and citizens' participation in SPNA management (Article 3, paragraph 7 and Article 18), which will ensure the involvement of the local population in the decision-making process on the issues of nature protection and sustainable management of the national park. Protective zones will be organized in a mandatory manner around state nature and biosphere reservations (reserves) and national parks (Article 8, paragraph 2) with a regulated regime of nature management where the "main types of traditional economic activities of land users that ensure sustainable use of natural resources are allowed" (paragraph 33). It is the first time the Law provided the possibility of obtaining compensation by businesses and individuals for the losses that they may bear in the process of reservation of land plots for the organization of SPNA (Article 9, paragraph 2) "in accordance with the procedure established by the legislation of Turkmenistan." At the same time, the declaration of a protected area does not involve the immediate withdrawal of the respective land from its owners and users, except for the core of the protected area, where a strict regime of protection will be maintained (Article 7, paragraph 8; Article 29, paragraph 3).

One of the fundamental provisions of the new Law is the expansion of financial mechanisms in support of SPNAs (Article 12) where, for the first time, along with the traditional funding sources from the state budget, the use of other potential funding sources is allowed (Article 12, paragraph 8). Development of new funding mechanisms for SPNAs is aimed at strengthening private initiatives in biodiversity conservation, which may play an important role in the strengthening of the entire management system of specially protected natural areas of Turkmenistan.

Legislation on wild plant species

The main law for the conservation of the biological diversity of plants is the *Law On Protection and Rational Use of Plants* (1993), which is aimed at the conservation of biological diversity under natural conditions, the protection and conservation of plants, as well as conditions for their multiplication, scientific research and rational use. Diversity of vegetation includes all species of wild plants, including forest fruit species, rare and vulnerable plants, trees, shrubs, mosses, water-plants, mushrooms and lichens, among others. The Law determines not only the rights and responsibilities of the users of plant diversity, but also the conservation, production and the increase of the populations, while the government is responsible for supervision of conservation and use of plants.

In general, the purchase and sale of wild plant diversity on public lands, as well as the collection of plants for commercial purposes, are prohibited. Land owners and users are, at the same time, the owners and users of plant diversity growing on their lands. Payments for ownership and use of plant species outside the forest lands are subject to land taxes, and also the payments for the use of forest land include the use of forest resources within them. However, temporary users of plant diversity pay for plant resources separately. Concrete participation of farmers and local communities in the

maintenance of local fruit crops and their wild relatives is not contemplated, and the collection of plant accessions is permitted by scientific research institutes for scientific purposes. In the *Criminal Code of Turkmenistan* (1997) the list of punishments for illegal extraction of plants and their derivatives was developed, but without specific indication of the crop wild relatives and the importance of their conservation.

Legislation on forest resources

Forests in Turkmenistan are regulated by the *Forest Code* (1993) and the *Law of Turkmenistan On Forests* (2010). All forest genetic resources of the country are the property of the state. Land tenants (farmers) are only users of a part of the forests and of the genetic resources growing there, for example, the pistachio massif in Badkhiz or pomegranate stands in the southwestern Kopetdag. Also, parts of forestlands were transferred to long-term use in favour of *daykhan* (farming) enterprises for distant pasturing of cattle and may negatively affect the habitat of rare plants and animals.

Forests are subject to protection as they are part of the national wealth of the country. Forests in Turkmenistan form the *State Forest Reserve*, which consists of forests of national significance (Clause 1, Article 1 and 2 of the Forest Code). Normative regulations of forest legislation aim at conserving the state forestlands and implementing the national programme on forests adopted in 1998 for the establishment of forest parks in the foothills of the Kopetdag.

The main normative and technical document for the management and use of forests as well as the planning and forecasting of forest management is the *Materials for Forest Establishment*. However, the last forest establishment was implemented in 1988-1989 (Forest Reserve, 1988) and afterwards, maintenance was implemented by forest enterprises, with the primary aims of monitoring forest areas, reforestation and growing of seedlings. Finally, forest enterprises were transferred to “Gyukgushak” associations, which have not received state financing since 2000, and whose activities are concentrated mainly in growing seedlings for recreational parks around Ashgabat. Forest enterprises were again transferred to the Ministry of Nature Protection in April 2009.

Current status of the conservation of wild fruit and nut species

Unfortunately, the acting mechanism in the country for the implementation of the legal structure on SPNAs and forest lands has certain imperfections that necessitate efforts for legislative framework improvement. By laws that allow for the development of a sustainable management of SPNA in practice and legal norms on the protection of genetic resources of wild relatives of fruit crops are urgently needed.

Conservation of specially protected natural areas

There is an ongoing effort to integrate SPNA into the agenda of regional development in Turkmenistan. At the same time, national efforts on SPNAs are gradually catalysing the regional development of protected areas and the improvement of activities on the regulation and management of populations of wild animals and plants.

Based on the promulgated decision of the Ministry of Nature Protection of Turkmenistan, the *Main Directions for the Development of a System of Specially Protected Natural Areas to 2030*" (2007), there were established within a period of twenty years: four new reserves (Balkhan, Prikarabogazsko-Southwestern-Ustyurt, Western-Uzboy and Karabil), six national parks (Central Karakum, Sumbar, Balkhan, Koytendag, Serkhetabad and Archabil), more than 10 refugiums and almost 100 natural monuments. In addition, the Ministry of Nature Protection of Turkmenistan has urged the Cabinet of Ministers to consider the Badkhis Reserve as a world natural heritage site and documents are being prepared to declare another one (Sumbar National Park in the southwestern Kopetdag).

It is known that a large part of the territory bordering with SPNAs in the region consists of lands where local communities feel ownership of their resources. At the same time, territories bordering future national parks and reserves can have a huge effect on the sustainability of biodiversity resources and of the relevant ecosystems. The main aim of the establishment of an SPNA is the conservation of biodiversity on a global scale, the protection of natural complexes and the management of their resources. In this connection, the provisions contemplated in the diverse and prolific laws need to be harmonized to allow an effective implementation, the elimination of contradictions between the separate SPNA laws and other legislative acts and, moreover, to cover important gaps in *in situ* conservation as the specific protection mechanism for wild fruit crops is still absent. Neither is there any norm for the protection of genetic resources, either in this law or in the new *Forest Code* (2010).

Finally, a place should be assigned for the formation and development of traditional forms of natural resource use by changing the relationship of people to biodiversity and the environment. It will be necessary to develop the mechanisms for integration of national parks into social and economic systems with encouragement of local communities to participation in the management and development of national parks and in the use of their resources.

Conservation on forest lands

The main part of forest lands has been managed since April 2009 by the Ministry of Nature Protection. However, the system for the legal protection of forest lands insufficiently reflects international obligations on the conservation of plant genetic resources that were agreed to by Turkmenistan. This fact impedes efforts to improve the rational use and conservation of forest genetic resources, including genetic resources of fruit crops and their wild relatives.

The system of rational use of plant resources should seek to conserve and protect the resource and its habitat. Thus, it is necessary to recognize the importance of the conservation of wild relatives of fruit crops in forest lands in the Government's *Strategy of Green Development*, which is one of the country's mechanisms of intensification of national economic development. There is no pre-existing legal basis on access to plant genetic resources in the country. These issues are in some way considered in the current law *On Protection and Rational Use of Vegetation*, which envisages regulation of activities involving the distribution of some wild plant species to prevent any damages to other species of plants and animals (Chapter 4, Article 13.2). This law provides for the implementation of arrangements that aim to restore and produce some plant varieties (Chapter 4, Article 12.1), and to set up a special system for the protection of plant species and associations included in the *Red Data Book of Turkmenistan* and the *Red List of the International Union for the Conservation of Nature* (IUCN). However, regulation of trans-border transportation of genetically modified plants to Turkmenistan is not yet provided for in laws that cover the protection and conservation of plants (Chapter 5, Article 17). The issue of the protection of national agricultural biodiversity from the introduction of invasive wild species is not considered (Chapter 6, Article 25), even in the chapter on monitoring, and is not reflected in the system of state arrangements on inbound and outbound quarantine of plants.

Unfortunately, in recent years the *State Forest Cadastre* has not been conducted and there is a lack of updated information on forest management and inventory. As a consequence, no updated data on areas covered by juniper trees, deciduous and fruit forests has been adequately considered and reflected in the new *Forest Code* (2010). There are no special arrangements for the rehabilitation and restoration of juniper, deciduous, and especially fruit, forests that would permit developers of the Code to underline the significance of the conservation of wild relatives of food crops.

Existing mechanisms for customs control and oversight by the Ministry of Nature Protection (through specific permits), together with the appropriate control of neighboring countries that signed the *Convention on International Trade with Species of Wild Fauna and Flora* (i.e. Russia), provides somehow for limits on the export of species from Turkmenistan. However, imperfections in control mechanisms and weak influence of inter-sectoral and interdepartmental cooperation do not eliminate the threats of illegal export of some components of biodiversity.

Conservation ex situ

A unique genebank of wild fruit trees in the Makhtumkuli Scientific Production Center of Genetic Resources (MSPCGR) of the Institute of Botany of the Academy of Sciences of Turkmenistan is the national heritage of Turkmenistan and was reorganized in 2009. Here 4,040 accessions of fruit crops and their wild relatives were collected by scientists over many generations and conserved in the zone of dry subtropics. The genebank of this Center contains 450 accessions of fruit crops of Turkmenistan and 1,000 accessions of Central Asian origin.

At the beginning of the new century, the number of accessions in the fruit crop genebanks of MSPCGR was considerably reduced: collections of cherry-plum, peach, pear and apricot were completely lost, the collection of grape was halved. As a result, the 2004 inventory of the MSPCGR field collection consists of 1,937 accessions: 890 accessions of pomegranate, 419 accessions of grape, 137 accessions of apple, 101 of olive, 92 of fig, 91 of persimmon, 59 of jujube, 43 of pistachio and 34 accessions of pear. In 2006, nurseries were established for grape, fig, apple, pomegranate, apricot, and persimmon seedlings. From 220 accessions conserved in the collection, 142 accessions of eight crops are traditional local varieties, which form 22% of the total quantity. Passport data of 36 local varieties of apple; 94 wild forms and 42 varieties of pomegranate; two local varieties of pear; 15 varieties of fig from people's breeding efforts; 15 accessions of wild *Pistachia vera* of Turkmen origin; 18 wild forms and eight local varieties of almond; and 34 local varieties of grape, including seven traditional varieties of grape of Greece-Parthian cultivation, were documented.

Participation of communities in agricultural biodiversity conservation

The current *Law On Public Associations* (2003) was aimed at the realization of citizens' rights to establish public associations. In accordance with Article 21 of this Law, citizens can hold meetings in labor organization sites to discuss and make decisions on issues regarding their activities and livelihoods. However, in the country at present there are no public structures supporting the conservation of wild relatives of fruit crops and agricultural biological diversity.

There are three ecological public organizations registered at the Ministry of Justice of Turkmenistan and active in the country: the Turkmen Public Association of Nature Protection, the Turkmen Society of Hunters and Fishermen and the National Society of Hawkers of Turkmenistan. Members of these organizations are not engaged in decision-making with regard to the above-mentioned issues. Access of communities to ecological information is realized through the means of mass media (newspapers, radio and TV broadcasting). Participation of communities in discussions and decision-making in the different fields of biodiversity is limited to their participation in thematic workshops, meetings and round tables.

Conclusions

The body of ecological legislation of Turkmenistan is a sufficiently developed mechanism for the legal protection of biological diversity in protected natural areas and forest lands, although it needs a coherent system for its implementation in practice. Analysis of the key legislative and legal tools of Turkmenistan showed that many of the country's legislative acts are inadequate for the evaluation of interlinks between agricultural practice and conservation and the sustainable use of components of biodiversity through farmers' efforts. Conservation of genetic resources, and in particular of wild fruit and nut species, is absent in legislation on natural protected areas and forests.

In addition, mechanisms for carrying out the provisions of the legal codes have not been developed and require determined efforts to perfect legal policy. Many of the laws in force on nature protection are mere declarations of intent without adequate mechanisms for their realization. However, the new laws, and particularly the very recently new law on protected areas, offer the opportunity to engage in this component of biodiversity conservation of fruit crops and to stipulate their management in SPNAs in practice.

Recommendations

The analytical review of existing nature protection legislation in the field of conservation of wild relatives of fruit crops on protected areas and forest lands allows the development of recommendations on their perfection and harmonization.

1. For the effective conservation of wild relatives of fruit crops within protected natural areas we recommend that the following actions be undertaken in the country:
 - strengthening of inter-agency cooperation and implementation of monitoring of forest resources;
 - development of normative and legal instruments on sustainable management and protection of wild relatives of fruit crops;
 - development of a clause on mechanisms of control and execution of laws and normative acts for the management of protected areas and forest lands that considers the legal norms of protection with regard to forest genetic resources and wild relatives of fruit crops ;
 - establishment of a differential system of protection of traditional and sustainable nature use in the territory of national natural parks on a legal basis. Independent functional areas of national parks can be envisaged for provision of vital activities of local communities (including farmer-daykhans) where traditional economic activities and the nature use connected with them are permitted;
 - approval of the process of integration of ecosystem services into the economic development of the country by confirming the economic value of genetic resources, biological species, ecosystems and landscapes. Economic evaluation of ecosystem services provided by SPNAs allows the demonstration to local populations of possible benefits from direct use of their resources and from their implementation of environmentally-oriented services; and
 - legal specification of the conditions of *in situ* conservation of wild relatives of fruit crops in forest lands and protected natural areas should ensure the maintenance of the principles of specially protected natural complexes and features without altering the state's prohibition and limit of activities in SPNAs and maintaining the same purposes and tasks. Reformation of the ecological legislation of Turkmenistan will enhance the potential of systems of management of protected territories and the conservation of their biodiversity.

2. In the field of protection of forest genetic resources:
 - legal protection of the genetic resources of wild fruit species should be developed and added to the new edition of the *Forest Code*, with emphasis on their conservation and restoration;
 - the *Forest Code* should precisely stipulate that “forests and forest genetic resources, including crop wild relatives, are the exceptional property of the state and, being under its protection, their access and benefit sharing should be ensured in favour of the state and its population. The state is sovereign over plant genetic resources and has the right to receive benefits from their use on the territory of other countries”; and
 - a list of 16 of the most valuable local forest tree and shrub species (juniper, walnut, fig, barberry, sycamore, quince, pear, apple, ashberry, hawthorn, plum, almond, sour cherry, pistachio, pomegranate dogwood, grape and ampelopsis) forming the elements of the forest complex of the arid ecosystem of mountainous Turkmenistan should be added to the *Forest Code*.

3. In relation to the promotion of agricultural biodiversity conservation policies:
 - a document/strategy on the conservation and sustainable use of national agricultural biodiversity should be developed, taking into account the existent of information on genetic resources, and the need of coordination among the different stakeholders involved;
 - a confirmation should be prepared of the development need to regulate the implementation of state monitoring of coniferous, fruit and deciduous forests of Turkmenistan and to apportion specially protected forest plots with a limited system for forest use, including fruit forests of the mountainous massif; and
 - it is necessary to have in Turkmenistan a public association for the protection of agricultural biodiversity, which will assist the revival of small farms specialized in the conservation of national agrobiodiversity that includes fruit crops for conservation and the sustainable use of this agricultural biodiversity.

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UZBEKISTAN LEGISLATION ON CONSERVATION OF WILD FRUIT SPECIES ON PROTECTED NATURAL AREAS AND FOREST LANDS

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Introduction

Uzbekistan is one of the centers of origin of many plants belonging to the modern portfolio of flora. There are many species among them – wild relatives of fruit species – grown by humans for nutritional, medicinal, ornamental, technical and other purposes. Many of these plants such as apple, walnut, barley, spices, oil plants, onions, carrots, pistachio, and many others occupy an important place in human diets and livelihoods.

Wild fruit mountain forests have since ancient times served as a source of the best endemic trees, which used to be planted near human abodes and served as the basis for the creation of many excellent varieties that are still grown in the present and yield stable crops.

Currently, for a number of different reasons, primary among which is technological progress, in a reduction of the area planted with wild fruit crop varieties has occurred, while local varieties of fruit trees are being forced out by ones introduced from other countries. Therefore, there is an urgent need to take immediate action for their conservation. According to information from the Research Institute of Plant Industry, local varieties used to prevail several decades ago in a released assortment of agricultural crops, while now they amount to about 5% for apples, 12% for pears, 14% for sweet cherry, 38% for grapes, and 50% for apricots. The same situation is observed in other species.

Conservation of wild relatives of fruit crops and their local and ancient varieties and forms is crucial, since they are well-adapted to local conditions and have stable yields, are noted for their palatability traits, are resistant to pests and diseases and have other useful properties necessary for wholesome human nutrition. They serve as the basis for development of new varieties adjusted to various local plant conditions.

Humankind has bred many varieties of these plants, which have spread around the world and are grown on vast areas. However, demographic growth and increased

demands require the varieties in use to be characterized by increased production as well as adaptability to the changing environment. This increases the role of wild relatives of these plants since they are the reservoir of a unique gene pool that has been used and will continue to be used for breeding new plant varieties.

Recently, people have been actively interfering in the habitats of wild plants, making a negative impact due to unlimited cattle grazing throughout the country (except for wildlife reserves), stocking hay and firewood, harvesting crops of fruit trees and bushes, collection of medicinal plants, application of new technology and other interferences. This results in a cessation of reproduction of many species, including wild relatives of fruit species, and a reduction in their habitats and number.

According to research findings, many wild species are presently endangered and require development and protection measures. It appears that the most effective protection under current conditions is only possible within wildlife reserves. The findings from plant analyses in the Republic's wildlife reserves show that only in Chatkal Biosphere Reserve are there well-preserved plantations of three types of almond and stunted plantations of Siever's apple. Currently, different organizations in Uzbekistan are in charge of biodiversity conservation (including that of wild fruit crop relatives), although not as an integrated line of activity, such as the Main Forestry Department of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan, State Nature Protection Committee, and Tashkent Regional Hokimiyat. Each of these organizations pursues own management policy by building its own regulatory methodological and technological frameworks, which are often uncoordinated among one another. This often discourages making optimal decisions both nationally and locally.

Vavilov and Popov considered mountainous and piedmont regions in Uzbekistan (Tashkent, Kashkadarya, and Surkhandarya Regions) as the most likely center of origin of cultivated fruit varieties of certain plants, specifically, *Malus*, *Pyrus*, *Ficus*, *Morus* and others. The presence of the above-mentioned species in these regions confirms this hypothesis.

Uzbekistan is home to wild original species and interspecies taxa of fruit plants noted for their exclusive diversity. Species of *Juglans*, *Malus*, *Amygdalus*, *Prunus*, *Pistacia*, *Crataegus*, *Berberis*, *Ribes*, *Hippophae* and other genera are very common. Species of *Juglans* and *Malus*, *Amygdalus* and *Pistacia* genera stand out for their vast habitat and polymorphism. Uzbekistan is also rich in vegetable crop species diversity, being a centre of origin of bulb onion (*Allium cepa*), carrot (*Daucus carota*), radish (*Raphanus sativus*), spinach (*Shpinacia oleraceae*), garden cress (*Lepidium sativum*), coriander (*Coreandrum sativum*), basil (*Ocimum basilicum*), turnip (*Brassica campestris*) and others. Spicy and aromatic plants used by local populations are highly valued in the country. These include species of *Bunium*, *Berberis*, *Ziziphora*, *Origanum*, *Mentha* genera.

The status of wild fruit crops within protected areas is quite satisfactory, but they are facing shrinkage of their habitats and genetic erosion elsewhere. Fruit are harvested without regard for reproduction of the population. In particular, the most valuable forms that bear high quality fruit are harvested on an unregulated basis. This pattern applies to pistachio, walnut, apple, hawthorn and other plantations. In addition to fruit harvesting, cattle overgrazing eliminates natural regeneration of these crops. There is also uncontrolled harvesting of medicinal herbs, wild onions, and garlic.

Local communities commonly use non-tree forest products. There are companies specializing in procurement of wild plant raw materials for the production of pharmaceutical goods and foods with the use local biological resources.

In general, botanical diversity is a powerful potential resource for satisfying economic needs, since otherwise it is impossible to achieve sustainable development of the society at large. The scope of human impact on botanical diversity is on the rise, primarily because of the growing popularity of modern patterns of consumption, production, agricultural and industrial development, and others. The catastrophic drying out of the Aral Sea is leading to changes in biological diversity not only in Uzbekistan, but also throughout Central Asia along with expanding scales of desertification and overall aridization of natural ecosystems.

The main causes of genetic erosion are uncontrolled fruit harvesting, overgrazing, and tree felling for firewood. An additional important factor is the poor awareness of the population about the value of wild plants and their role in food security.

Legal framework for agricultural biodiversity conservation

The plant world is a crucial component of the natural environment, a source of renewable natural resources (wood, fodder, technical and medicinal raw materials, food) for humans, a basis for plant breeding and introduction of useful plants that are necessary to ensure human sustenance. Plant communities shape a vegetative canopy that performs key functions of ecosystem formation and environmental protection such as water regulation, soil protection, erosion control, and others. Laws on nature conservation play a key role in their preservation.

At present in the country more than 40 legislative and approximately 70 sub-legislative acts are effective in the area of the environment. The basic legislative act regulating nature-conservation relations is the *Law On Nature Protection* (1992). Legal, economic and organizational frameworks for environmental conservation, sustainable use of its natural resources, protection of ecological systems, natural complexes and certain objects are established in this law. Besides the *Law On Nature Protection*, a number of other laws regulating relations in different areas of management and conservation of environment have been developed in the Republic, such as the *Law on Forest* (1999), the *Land Code* (1998) and the *Law on Protection and Use of Flora* (1997).

The *Law of the Republic of Uzbekistan On Protection and Use of Flora* of 26 December 1997 governs relations in the area of protection and use of flora growing in natural environments as well as wild relatives of fruit crops maintained under cultivated conditions to ensure their regeneration and gene pool conservation. The law has set the following main objectives for legislation on protection and use of flora:

- conserve species composition of flora and their gene pools under natural conditions;
- preserve the integrity of natural plant communities and habitats of wild plants;
- ensure sustainable use and regeneration of flora; and
- provide for legal regulation of activities of legal and physical entities in the area of conservation and use of flora.

According to Article 5 of the Law, the components of flora include:

- wild growing organisms – a species diversity of ligneous, shrubby, and herbaceous seed plants, ferns, bryophytes, algae, lichen, and mushrooms;
- natural plant communities formed by wild-growing organisms or any of their aggregations;
- rare and endangered plant species; and
- fruit, seeds, and other parts or products of wild-growing plants.

At the habitats level, the main regulatory legislative document ensuring the establishment and activity of protected natural areas is the *Law On Protected Natural Areas*, adopted by the *Oliy Mazhlis* (Parliament) of the Republic of Uzbekistan on December 2004. The Law applies several categories of Protected Natural Areas (PNA) following the criteria of the International Union for Conservation of Nature (IUCN) (1994), which allows the creation of united ecological systems of protected natural territories in different regions, and provides for a combination of ecological and economic interests in the country.

In accordance with the 2004 *Law of the Republic of Uzbekistan On Protected Natural Areas*, protected natural areas, are divided into seven categories depending on their target purpose and regime (Article 5):

1. state reserves;
2. complex (landscape) reserves;
3. natural parks;
4. state natural monuments;
5. territories for conservation, reproduction and regeneration of separate natural objects and complexes;
6. protected landscapes; and
7. territories for management of certain natural resources.

The State Reserves are the most protected territories where “any activity is forbidden, except for research activity and monitoring of natural environment” (Article 19). Regarding natural parks, it can be noted that territories of parks consist of three different zones (protected, recreational and zones of economic and other use).

Any activity that may harm flora is prohibited within the territory of natural parks. In addition, legal regimes are also established on other categories of protected areas corresponding to each specific issue.

The *Law On Forest*, dated 15 April 1999, regulates issues of conservation, protection, sustainable use and restoration of forests and increase of forests' productivity. The Law clearly defines issues of implementation of state administration and control. State administration is implemented by the Cabinet of Ministers of the Republic of Uzbekistan, decentralized bodies of state authority on places, the Department of Forestry and the State Nature Committee (Article 9). The Department of Forestry and its decentralized offices are considered state organs of forestry. However, State control over conservation, protection, use and reproduction of forests is implemented by the Cabinet of Ministers of the Republic of Uzbekistan, decentralized bodies of state authority and the State Nature Committee. The Department of Forestry implements not governmental but "departmental" control over protection, conservation, use and reproduction of forests.

Generally, the *Law On Forest* defines the types of use of forests, their flora, fauna and forest resources. The *Law On Forest* underlines that right for use to legal and physical entities is provided by state organs of forestry or authorized organs, institutions and organizations. They can issue special permits such as forest tickets for grazing, haying, cutting of trees, etc. The rules of fire safety in forests are given in Appendix 1 of the decision. The rules of cutting and maintaining forests are given in Appendix 2. These rules define when and what kind of tree is allowed to be cut (for example, it is prohibited to cut trees with an age of less than seven years) by forestry bodies, or others authorized by them. In addition, it defines that any cutting of trees in protected natural areas is forbidden. The basic concept of forest management is that cutting of trees is carried out in order to improve forests.

The rules for haying and grazing in forests are given in Appendix 3. Organizations and institutions carrying out forestry activities, together with *khokimiyat* (local executive authority) of districts, determine areas suitable for haying and grazing. To obtain permission it is necessary to request a "forest ticket" from those organizations and institutions managing the forests. Such tickets provide the right to use plots for haying and grazing on both short-term (up to 3 years) and long-term bases (3-10 years).

The *Decree No 215 of the Cabinet of Ministers of the Republic of Uzbekistan On Approval of the procedure for determining the category of forests' protection* of 5 June 2000 determines the categories of forest protection on Forest Reserve territories. Determination of the category of forest protection has great importance, because other regulation-legal acts make reference to them in determining what types of use and activities are allowed.

At present, reserves of the Republic belong to different departments and organizations: the State Committee on Nature Protection, the Ministry of Agricultural and Water Resources, the Ministry of Geology and Tashkent Regional *Khokimiyat*.

Activities on conservation of flora in protected natural areas differ from those in other territories. To begin with, forest reserve territories are excluded from economic turnover, and any economic activity is prohibited there. Second, the intrusion of forest violators in these territories has a singular character due to the reliable protection given by inspectors of reserves and national natural parks and to the established high quotations for damages due to violations connected with flora (in comparison with other forest territories they have been increased three-fold).

The Decree #293 of the Cabinet of Ministers of the Republic of Uzbekistan On approval of taxes for calculation of sizes of penalties for damage caused to flora of the Republic of Uzbekistan of 27 July 1995 was adopted in accordance with the *Law On Nature Protection* (1992). According to the decree, sizes of penalties for damage caused to flora of the Republic of Uzbekistan are settled within certain territories.

In case of violation of the legislation on nature protection, on protection and use of flora, and on the rules and orders for managing forests, specific types of responsibility (administrative, criminal and civil) are applied to violators of nature management, according to the 1994 *Codes on Administrative Responsibility and Criminal Code*. Legislation in the the Republic thus places a reliable barrier against violators of reservation regimes, providing *de facto* conservation of all flora in these protected and inviolable natural areas.

During 2006 more than 3,500 violations were infringed to flora, according to the State Nature Committee. Penalties for more than 22 million sum (equivalent to 16,923 USD) and claims for damage for more than 80 million sum (equivalent to 61,538 USD) were enforced. For the first quarter of 2006, 1700 violations were revealed, penalties for more than 10 million sum (equivalent to 7,692 USD) and claims for more than 31 million sum (equivalent to 23,846 USD) were enforced. It is necessary to note that the percentage of violations resulting in the destruction of wild relatives of fruit crops is a small percentage of the total number of revealed violations. Mainly these involved cutting of pistachio trees for making fences to keep out cattle, collection of different types of onions (for food) and the cutting of apple trees for replacement by more productive varieties.

Conservation of wild fruit species in Protected Natural Areas (PNA)

The problem of conservation of wild relatives of cultivated crops is connected with economic issues. Local populations from the earliest time have used products of

wild plants in food, as medicine, for various handicrafts, for coloring handmade products (walnut bark, leaves and shell are used as dyes). At the present time, the threat to nature has been increased many-fold due to social-economic problems of the transition period. This threat is primarily to flora, as it is the most easily extracted.

Research on flora in the Uzbek area (Bostanlik, Parkent and Akhangaran regions) western Tien Shan, developed under the GEF/WB project "Bioersivity conservation in Western Tien Shan" demonstrated (Kashkarov *et al.*, 2003; Brylskiy *et al.*, 2005) that the degree of anthropogenic disturbance near settlements reaches 90-100% and never drops below 20% and that the natural flora is found in the depths of mountain massifs.

At the end of the project Brylskiy *et al.*,(2005) also report that:

"Flora of the Ugam and Pskem ridges is very rich and diverse. Mountainous and high mountainous representatives of flora grow there as well as foothill and valley ones. There are nut forests in the far western part of the Ugam ridge. The flora of Western Tien Shan is one of the richest in Central Asia. 3500 species of plants are found in Western Tien Shan out of 9000 of the vascular plants growing in Central Asia. The largest families are typical for the Ancient Mediterranean region. The flora of the Uzbek part of Western Tien Shan consist of more than 2200 species from 472 genus and 87 families. The leading families are Asteraceae, Fabaceae, Poaceae, with domination of three supergenus: Astragalus, Allium and Cousinia. Absolute endemics are four genera and 208 species. Fifty-seven plant species are protected by the State. There are 150 wild relatives of cultivated plants which can be used for breeding new varieties. Wild cultivars' ancestors are growing on the territory of the Chatkal reservation. They are: apple tree, walnut, grape, lucerne and tulips. Ancestors of cultivated plants that grow on the territory of Ugam-Chatkal National Park are apple, walnut, grape, alfalfa, tulip."

The situation described above explains why the conservation of wild species of horticultural crops should be focused in the analysis of natural protected areas and the *Forest Fund* as habitats critical for their survival. The current system of territories granted the status of PNA (Protected Natural Areas) is represented in Uzbekistan by nine state reserves, two natural parks, six state nature monuments, 12 preserves and one natural nursery of rare animal species. The total area of protected territories in the republic is 5.80% of the total territory of the country, and a strict regime of protection has been established. State reserves (1.8%) are the most protected natural territories where any economic activity is prohibited (Art.19) so that in this connection the effective protection of wild relatives of fruit crops is carried out.

In October 1995 Uzbekistan joined the *Convention on Biological Diversity* and in 1998 developed the *National Strategy and Action Plan on Conservations of Biodiversity* (NSAPCB). One of the main tasks of this strategy was the organization of a stable

system of protected natural areas covering up to 10 percent of the total area of the country. On the basis of the analysis of the distribution of wild relatives of fruit crops, a list of areas was proposed with the aim of expanding the existent protected natural areas and declaring new ones to cover the diversity of wild relatives of fruit crops (Table).

The main threat to biodiversity in Uzbekistan is the loss of species and negative human activity and transformation of the habitat of species of flora and fauna. Only during one decade (from 1991 to 1999) the number of plants belonging to the category of rare and endangered species increased almost two-fold. Excessive cutting of forests, especially in riverside and mountainous areas, has led to a reduction of forest cover of the Republic almost up to 1%. Forest ecosystems are becoming increasingly rare in the country and their further loss/degradation presents serious threat to forest biodiversity.

More than 90 forest locations function in the republic and natural plantations of wild fruit species are found on the territory of 20 of these. Adequate systems of biodiversity conservation have not yet been created, especially in unprotected natural areas, where the pressure on natural ecosystems is considerably higher. For example, in Hissar Ridge along the rivers Sangardak and Tupalang (Surkhandarya Province) such types of wild fruit crops as common pomegranate (*Punica granatum* L), common fig (*Ficus carica*), wild grape (*Vitis vinifera* L), common unabi (*Zyzyphus jujuba* Mill), oriental persimmon (*Diospyros lotus* L), chapparal currant (*Ribes malvifolium*) and others are found. In Western Tien Shan in the valleys of the rivers Pskem, Ugam, and Chatkal of Tashkent Region, the above-mentioned wild fruit crops as well as some others included in the Red Book of Uzbekistan (2006) are found and are close to extinction. The Central Asian pear (*Pyrus asia-mediae*) is an extinct species of Western Tien Shan.

In addition, natural brushwoods of wild fruit species are widespread in Babatag, Nurata and Kuramin Ridges, where two threats to their conservation exist: first, excessive grazing as grazers consume natural young growth, interrupting the generation and replacement of wild plants; second, increasing population leads to increase in demand for wood for heating and cooking, causing a significant threat to trees growing in the wild. Reasons for the ineffectiveness of the protection of wild relatives of fruit crops include:

- lack of legislatively issued list of species of wild fruit crops in need of conservation;
- lack of preparedness of decision-makers to understand the role of wild relatives of fruit crops in agricultural development and realization of benefits;
- lack of awareness on the part of the local population of the role of wild relatives of fruit crops in development of horticulture (absence of dissemination and capacity building);
- low level of professional training of middle and lower-level stakeholders in the management of conservation of wild relatives of fruit crops; and
- lack of direct material (financial) interest of local people in conservation of wild relatives of fruit crops.

List of protected natural areas proposed for expansion and new creation to cover the proper conservation of wild fruit species diversity (stated in approximate area)

Name of protected area	IUCN category	Forestry farm where it will be organized	Administrative subordination	Location	Area, thousand ha
Sangardak reserve	I	Sangardak and Zevar forestry of Uzun forestry enterprise and in lands of State Land Reserve	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Uzun district, Surkhandarya province	200
Pskem reserve	III	Pskem forestry of Brichimullo forestry enterprise	Khokimiyat of Tashkent region	Bostanlik district, Tashkent province	150
Branch of Surkhan reserve	I	Baysun forestry enterprise	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Baysun district, Surkhandarya province	85
Babtag reserve	III	Babatag forestry enterprise	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Uzun and Shurchi districts, Surkhandarya province	120
Kuramin reserve	III	Ahangaran forestry enterprise	Khokimiyat of Tashkent region	Ahangaran district of Tashkent province	60
Nurata-Kizilkum Biosphere Reserve	IV	Enlargement of Nurata Reserve	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Farish district of Jizzah province, Nurata district of Navoiy province and Koshrabot district of Samarkand province	1000
Amankutan state national nature park	II	Amankutan forestry of Samarkand forestry enterprise	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Urgut district, Samarkand province	10
Branch of Zarafshan reserve	I	Mountain plot «Chunkaymish» of Samarkand forestry enterprise	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Nurabad district, Samarkand province	4
Amudarya Asiatic poplar-oleaster biosphere reserve	IV	Badaytugay reserve, Beruniy and Nukus forestry enterprise	The Ministry of Agriculture and Water Resources of the Republic of Uzbekistan	Nukus and Beruniy districts, Republic of Karakalpakistan	15

The establishment of a strict regime of protection in the territories of reserves and national natural parks, as well as the addition to the *Law On Protected Natural Areas* of a new article (Art. 42) on “Territories for management of separate natural resources” will allow the carrying out of effective protection of wild relatives of fruit crops.

Along with the *Law On Protected Natural Areas*, an essential role in the regulation of relations on the use and conservation of wild relatives of fruit crops is played by the *Law On Forest*. This law was accepted in 1999, that is before acceptance of the *Law On Protected Natural Areas*, and some of its norms that can provide safety of wild plants, including wild relatives of fruit crops, need to be revised (this revision is currently under way).

The world community recognized that the establishment of a network of specially protected nature areas is the most effective measure that can be taken for the conservation of endemic, rare and endangered species, unique land plots, and natural ecosystems. The existence of protected areas is a guarantor and source of potential environment restoration. State nature reserves play a key role in biodiversity conservation.

Conclusions

The issue of managing natural resources may at first glance appear to be simple, but in fact it requires thorough research and proper legal regulation. According to the legislation, each citizen is entitled to use the fruit of wild fruit crop relatives and their ancient varieties in the amounts and within territories permitted by local authorities. However, in practice issues of common use of products of wild fruit crop relatives and their ancient varieties require specific and thorough research since, under market conditions, those who lease land that is home to wild fruit crop relatives and their ancient varieties often do not allow outsiders to use their products. A similar situation regarding the use of wild fruit crop varieties and their ancient varieties applies to protected areas (nature reserves, wildlife sanctuaries, and others) as well.

The analysis of legislation of the Republic of Uzbekistan on conservation of wild fruit species in protected areas and in forests of the Republic allowed us to ascertain the following key problems:

- lack of legislation on forests in the republic aimed at establishing a sustainable forest management framework that includes wild fruit crop varieties and their ancient varieties and that meets international standards;
- poor financial and technical foundation in the area of forestry development;
- inadequate cadastral measures and monitoring of forest resources;
- negative human impact: forest felling, cattle grazing, fires, and others;
- poor public awareness about the role and importance of crop wild relative conservation;

- inadequate funding from the state budget for conservation and regeneration of wild fruit crop varieties and their ancient varieties;
- insufficient skilled workforce at forestry enterprises;
- lack of foreign investment in the forest sector; and
- low efficiency of forestry enterprises due to obsolete logistical framework.

The completed analysis leads to the conclusion that there is a need for the following measures to enhance legal aspects of natural resources management:

- the Main Department of Forestry under the Ministry Agriculture and Water Resources of the Republic of Uzbekistan should develop a forest policy, legislation and the *Forest Code*, including issues on conservation, use, and regeneration of crop wild relatives and send for approval of the Cabinet of Ministers of the Republic of Uzbekistan, and the Parliament (*Oliy Majlis*);
- the Government should enhance the system of sustainable forest management to meet international requirements;
- legal support of financing and large-scale and comprehensive inventory of Forest Fund lands to identify the overall forest status;
- consider the role of local people in forest management, including wild fruit crop relatives through involvement in decision-making; and
- organize training and improve the skills of forestry staff both in the country and abroad.

Recommendations

General recommendations

1. It is necessary to conduct scientific research in sites where wild relatives of fruit crops grow as has been proposed in the list in the Table, with the expansion of protected natural areas and the creation of new ones for the specific conservation of wild fruit crops.

The UNEP-GEF project “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*” coordinated by Bioersity International works in close cooperation with the Main Department of Forestry of the Ministry of Agricultural and Water Resources and the State Committee on Nature Protection in the area of development of proposals on the expansion of existing and the creation of new protected areas.

Only the establishment of a strict protection regime in the territory of State Forest Funds will permit the effective protection of wild relatives of fruit crops. Considering this, the Main Department of Forestry of the Ministry of Agricultural and Water Resources of the Republic of Uzbekistan made a proposal to the Cabinet of Ministries of the Republic of Uzbekistan to organize the investigation of territories of the State Forestry Reserve in order to give to a large number of subjects (such

as forestry enterprises and hunting establishments) the status of protected natural areas. It will allow a considerable increase in the area covered by the territorial form of biodiversity conservation.

2. The *Law On Protected Natural Areas* (2004) outlined the category “territories for management of separate natural resources”. This category includes lands of the Forest Fund, occupied by anti-erosion forests, forests around the green zones of cities and other settlements and industrial centres, and especially valuable forests, forests of nut-production zones, forest fruit plantations that have scientific and historical value, and land plots of hunting establishments intended for sustainable use of flora and fauna. In this connection, it is necessary to request the Main department of forestry to explore natural habitats of wild relatives of fruit crops within the territory of forest fund, identify their status and develop proposals to transfer of these areas to the protected natural territories.
3. Draft regulation of local authorities on the organization of protected natural areas of different categories should be prepared in accordance with the results of scientific research.
4. It is necessary to prepare additions to the Decree 506 of the Cabinet of Ministers of the Republic of Uzbekistan dated 22 November 1999 *On approval of some regulation acts on protection of forests of the Republic*, on the basis of the *Law On Protected Natural Areas* with regard to permitted economic activities regarding the different categories of PNA.
5. For the conservation of wild relatives of fruit crops, as a first priority it is necessary to develop draft Decree of the Cabinet of Ministers on issues of conservation of these species with concrete actions in sites of where they grow, with the view of restoring their numbers. It is necessary to provide some privileges for those who will deal with this problem (on micro crediting, tax privileges, etc.).
6. Awareness raising. It is necessary to carry out purposeful work on increasing environmental awareness with a rational view of natural resources. Actions harmful to nature should be eradicated. It is necessary to increase the level of skills in environmental protection and people should be aware of the causes of environmental problems and how to conserve the ecosystems of the region. It is necessary to form environmental awareness and knowledge of the principles of nature protection and sustainable nature management. Each individual should know about special protected natural areas, as well as the possibility and consequences of environmental catastrophes; it should be recognized that humanity's very existence as well as its prosperity is largely dependent on the ecological balance of biosystems.

Recommendations regarding forest legal framework

National partners took part in the workshop organized by the Chief Department of Forestry (April 6-8, 2009) to discuss the *Concept of Forestry Development in Uzbekistan until 2030* and provided their comments, notably:

- put forward a proposal to *Oliy Majlis* (the Parliament) on expanding protected areas in the Republic of Uzbekistan for biodiversity conservation including wild fruit crop relatives;

- develop legal and regulatory documents that provide for procedures and criteria for categorizing forest areas and other territories as protected natural sites. This would enable enlarging the area covered with territorial form of protection and using bio- and agricultural biodiversity;
- improve preparation, education, and enhance skills of forestry staff both within the country and abroad;
- enhance sustainable forest management systems, developing new legal and regulatory acts and a provision on communal forest management that meets international standards;
- join efforts of all stakeholders – local governments, self-governing bodies as well as district and regional governor's offices, associations of farms, scientific research institutions and other organizations – for conservation of bio- and agricultural biodiversity in the republic as well as for increasing the role of farmers and farming enterprises in this area;
- explain to farmers the advantages of local varieties as compared to introduced varieties using mass media, workshops and trainings and inform them that local varieties are better suited for the environment, different types of processing, and in particular that they are resistant to environmental stresses (resistance to salt, heat, drought, and early spring frosts) and others; and
- increase the role of local populations in the management of forest resources.

The project partners developed and submitted to the Main Forestry Office, Ministry of Agriculture and Water Resources of the Republic of Uzbekistan on April 12, 2010 a list of highly valuable tree species, which are progenitors of many cultivated crops widely used by local people for food supply. Unfortunately, these species are affected by human activities and currently are under the threat of disappearance. In this regard, it is necessary to include the prepared list of genera of highly valuable tree species in the draft Forest Code of the Republic of Uzbekistan to take measures for their conservation and sustainable use. It is recommended to include the following genera in the list:

1. Apple – *Malus*;
2. Pear – *Pyrus*;
3. Apricot – *Armeniaca*;
4. Almond – *Amygdalus*;
5. Walnut – *Juglans*;
6. Grapes – *Vitis*;
7. Pomegranate – *Punica*;
8. Pistachio – *Pistacia*;
9. Cherry plum – *Prunus*;
10. Fig – *Ficus*; and
11. Hawthorn – *Crataegus*.

At present the draft project of the new Forest Code of the Republic of Uzbekistan is under development and will include articles ensuring biodiversity conservation.

In accordance with the plan of action coordinated at the Regional Workshop on legal issues in the area of agricultural biodiversity conservation on November 11-14, 2010 organized in Tashkent, Uzbekistan, national partners have analyzed the *Concept of Forestry Development of Uzbekistan until 2030* and a draft of the new *Forest Code of the Republic of Uzbekistan* and made the following proposals:

As regards the Forestry Development Concept:

In the section *Forests of Uzbekistan*:

- forests are not a natural object of biodiversity conservation, but part of the national biodiversity; and
- the list of important issues of the *Concept of Forestry Development in Uzbekistan* ought to include additionally *conservation of biodiversity, which is one of the main goals of forestry.*

As regards the *Forest Code*:

- include *biodiversity conservation* to the list of forestry activities;
- define the heading of Section 2.4 more exactly as *Conservation of Biodiversity of Flora, Especially Wild Crop Relatives, and Fauna*, since conservation of biodiversity is not only essential for the implementation of the convention, but also for preventing extinction of plant and animal species composing the invaluable gene pool – the patrimony of the republic. Uzbekistan is one of the centers of origin of wild crop relatives and their conservation requires major efforts, the more so because the gene pool of wild crop relatives will be important for breeding new high-yielding agricultural crops; and
- the first paragraph on page 7 of Section 2.4 should be supplemented with the following: *Special focus should be placed on conservation of ecosystems by the State Forest Reserve including wild crop relatives that are currently in an endangered state.*

Specific proposals to draft Law of the Republic of Uzbekistan On Conservation and Use of Flora

The project partners have analyzed the draft Law of the Republic of Uzbekistan On *Conservation and Use of Flora* and have elaborated the following comments:

- the word *seed plants* should be deleted in Article 5 *Components of Flora* or supplemented as “*seed and clonal*” plants;
- the phrase *rare and endangered plants* should be supplemented with *and wild crop relatives*, which should also be subject to special protection;
- the first paragraph in Article 6 *Using Components of Flora* should specify that free-of-charge use is allowed without removing plants from their natural habitat, whereas their removal entails fee-based use, since the growing population may remove significant reserves of plants from their natural habitat to meet their own needs;
- in Article 7 *Types of Use of Components of Flora*, instead of *felling ligneous and shrubby plantations* it is better to say *harvesting of wood and brushwood*,

because very often felling is carried out to improve the composition of plantations or improving conditions for growth and this is not considered a valid type of use;

- the second paragraph of Article 11 *Restriction, Suspension...* should include wildlife sanctuaries in addition to nature reserves because the former also restrict the use of floral components. One more item about using plant gene pool should be added to this article as well, since this is an important issue included in different international agreements and a point of intensive discussions;
- article 18 *Using Components of Flora for Conservation Purposes* is unclear and requires explanation and elaboration;
- article 21 should specify, if relevant, that there are *specialty authorized bodies*, but if there are none, then it is proposed to establish a State Commission that reports to the Cabinet of Ministers of the Republic of Uzbekistan, which will address all these issues pertaining to conservation and use of components of nature. In addition, it is suggested to exclude hybridization from this article because scientific institutions practice it under special programs; and
- article 22 should reflect not only botanical collecting, but also a collection of *ex situ wild relatives of agricultural crops* for the purposes of gene pool conservation and plant breeding.

For the *Law of the Republic of Uzbekistan on Conservation and Use of Flora*, it is advisable to take into account the *Rules of Using Components of Flora in the Republic of Uzbekistan*, which were thoroughly compiled in 2007 and have a lot in common with the present Draft Law.

Recommendations on regional cooperation

1. establish and unite specially protected areas of the region in one program designed to create a regional environmental space;
2. strengthen the regional mechanism of coordination and management of activities aimed at the implementation of global conventions and programs;
3. establish a *Public Fund for Sustainable Development* for the region with branches in each country to support efforts of the countries in the region aimed at the development and implementation of the Convention and Strategy for Sustainable Development of the Central Asian Countries, which would be jointly managed by representatives of donors, governments, and local communities; and
4. establish an institute of global insurance from environmental, political, and economic risks and an insurance fund for regional safety and sustainable development.

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Strengthening Farmers' Management in the Conservation of Local Varieties



LEGISLATIVE FRAMEWORK SUPPORTING THE DEVELOPMENT OF *KRESTYAN* ENTERPRISES IN KAZAKHSTAN

Kultaev Amantay and Nurmuratuly Tleu

Introduction

Heterogeneous agriculture was developed and the necessary legislative acts regulating legal, organizational and economic frameworks for the development of the agro-production complex in the market economy were adopted as a result of the reforms in the country conducted in early 1990.

At present Kazakhstan has introduced the institution of private ownership of agricultural lands. Adopted in the years of reform, legislation and regulation acts directed at full liberalization of the economy of the agrarian sector sought to provide farmers with all necessary legal and socio-economic conditions for their free activity.

Forms of economic management in rural areas

Currently, the following types of economic entities are in operation in the country's agricultural system:

- agricultural enterprises as legal entities: Limited Liability Partnerships (LLPs), Production cooperatives (PCs), Joint Stock Companies (JSCs) and others;
- *krestyan* (farming) enterprises; and
- households (homegardens);

The subjects of the two latter categories are physical persons employed in agriculture without the formation of a legal entity. Altogether they presently comprise a dominant part of economic activity in rural areas and produce up to 70-75% of agricultural gross product of the country.

Legal, economic, and organizational basis for seed production are regulated in the *Law of the Republic of Kazakhstan On Seed Production* (adopted on 8 February 2003). The *Law On Krestyan (Farming) Enterprise*, adopted on 31 March 1998, regulates the procedure of allotting land for running a *krestyan* enterprise, oversees standards for providing land plots for different categories of citizens, describes rights

and obligations of *krestyan* enterprises, provides measures of state support, outlines deactivation procedures and includes other measures.

There are several differences between *krestyan* (farming) enterprises (hereinafter *krestyan* enterprises). A *krestyan* enterprise may engage in entrepreneurial activity in the form of a family business-based joint property. A farming enterprise can also be based on private business or simple partnership relying on tenancy in common under an agreement on joint economic activity. Presently (as of 01 January 2011), the country has about 196,000 *krestyan* (farming) enterprises, which account for the use of approximately half of agricultural land (46.4 mln ha) or about 40% (8.8 mln ha) of cropland.

According to data from the agriculture census of 2006-2007 in the Republic, 4,804 *krestyan* (farming) enterprises have perennial fruit-berry plantations and vineyards with an average size of 2.63 ha, from which 1,724, or 36%, have plantations up to one hectare (ha) in size, 2,702 (56%) have plantations ranging from one to five ha (at average 1.8 ha), 220 plantations are between five and ten ha (averaging 6.3 ha), 143 have plantations from 10 to 50 ha (at average 18.6 hectares) and 14 plantations are over 50 ha.

If the first group of households (36%) is considered small and therefore in fact as a “natural” economy, then the next group (64%) are commercial households requiring financial support from the state for the priority sector of agrarian production with the purpose of potential reduction of escalating imports and self-sufficiency of the Republic in fruit-berry production.

Regulations of land relations

In Kazakhstan from the beginning of agrarian reforms up to the present time, the main land legislation has changed three times. The last logical consequence of these transformations was the *Land Code of the Republic of Kazakhstan* adopted in June 2003. The specific feature of this legal instrument is the introduction of private property to agricultural land, while agricultural producers are offered a right of choice – buy land from the government as private property or continue to work under long-term (49-year) or short-term (5-year) leases. In addition, the government adopted 14 legal and regulatory documents to promote land use, which also: approve basic rates of payment for privatized land plots; set maximum areas of agricultural land plots within a single administrative region, which may be owned privately by a citizen of the Republic of Kazakhstan for running a *krestyan* enterprise; and established a nongovernmental legal entity for “running” agricultural commodity production.

The *Land Code of the Republic of Kazakhstan* provides mechanisms for determining payment options for land use with the aim of sustainable management of land, including rangelands, using base rates and the correction factors. According to the Land Code, the Government establishes the base rates and adjustment factors. The Government Resolution No. 890 of the Republic of Kazakhstan of 2 September 2003 *On Establishing*

Base Rate for Land Plot Payments in Cases of Privatizations, Leasing Land by the Government or State Land Users as well as Payments in Case of Selling Lease Rights to Land Plots establishes base rates of payments according to 14 soil types.

The *Code* also contains the procedure for providing land for use. State land users may be granted a land plot for permanent use, while citizens and legal persons are granted land plots for a temporary fee-based (rent) use or free-of-charge land use¹.

Land plots for temporary *free-of-charge* land use may be granted to the citizens and legal persons of the Republic of Kazakhstan for: free-range cattle farming (seasonal rangelands); grazing by cattle owned by individuals and haymaking; state land owners; home gardening; service allotments; and restoration of degraded and destroyed land. The period of temporary free-of-charge land use may not exceed five years except for cases of providing land as service allotments and restoration of degraded and destroyed land.

A right to temporary *fee-based* (short- and long-term) land use (lease) of a land plot may be granted to citizens, nongovernmental legal persons, and international organizations. Lease rates will be identified by local tax agencies for legal and physical persons based on Government Resolution No. 890 of the Republic of Kazakhstan as adopted on 2 September 2003 and entitled *On Establishing Base Rate for Land Plot Payments in Cases of Privatization, Leasing Land by the Government or State Land Users as well as Payments in Case of Selling Lease Rights to Land Plots*, estimated in the amount of 100-120% of land tax rates.

The financial mechanism for prescribing lease payments is indicated in the lease agreement and put into practice during interaction with the government. The lease payments from long-term land users are established at the level of tax rates.

Granting of land use rights means that the government directly grants a right to land use. Citizens and legal persons are granted land use rights on the basis of the decision of the local executive authority on regional (city of republican significance, capital), or district (city of regional significance) in accordance with its competency of granting rights to a land plot. Rights to land use are handed over to a different person for a certain period on the basis of an agreement on lease or temporary free-of-charge land plot use. Only persons who have bought the right to temporary fee-based land use may hand over or expropriate rights to land use. Land users are not authorized to autonomously change the intended use of a land plot in case of expropriation or handover of land use right.

1 In line with Article 36 of the *Code*, a temporary free-of-charge land use right is granted for the period of up to five years, temporary fee-based right is granted for up to five years (short-term) and from five to forty-nine years (long-term). A right to temporary fee-based land use is granted to citizens and nongovernmental legal persons of the Republic of Kazakhstan for 49 years for running a *krestyan* enterprise and agricultural commodity production, while foreigners and stateless persons are granted this right for up to 10 years (Article 37 of the *Code*).

With all this, it should be noted that at first glance it seems that legislative acts on land relations do not have direct relation to farmers involved in production of local varieties of fruit crops, but at the same time the *Land Code* and in particular its provisions on private ownership to lands of agricultural purposes are fundamental factors ensuring free entrepreneurial activities including free choice of cultivated crops and selection of varieties, including local varieties of fruit crops.

State support for *krestyan* enterprises development

A number of legislative acts, on the basis of which the support of *krestyan* and farming enterprises is implemented, function in priority sectors, including horticulture and viticulture, and were adopted and active up to the beginning of 2011. Major laws related to measures of state support for farmers are the following:

1. *Law on Krestyan (Farming) Enterprises, 1998 with subsequent amendments and additions, adopted on 24 May 2011;*
2. *Law on Taxes And Other Obligatory Payments To The Budget (the Tax Code of the Republic of Kazakhstan) 1995, revised in 2001, 2008;*
3. *Law on Financial Leasing, 2000;*
4. *Law on Agricultural Partnerships and Their Associations (Unions), 2000;*
5. *Law on Seed Production, 2003;*
6. *Land Code of the Republic of Kazakhstan, 2003;*
7. *Law on Credit Partnerships, 2003;*
8. *Law on Micro-Credit Organizations, 2003;*
9. *Law on Rural Consumer Cooperative of Water Users, 2003;*
10. *Law on Compulsory Insurance in Plant Industry, 2004;*
11. *Law on State Regulation of Development of Agro-Industrial Complex and Rural Areas, 2005;*
12. *Law on Private Entrepreneurship, 2006.*

The basic foundation for all active measures of state support for farm enterprises, as well as for other forms of economic activity in rural areas, is the *Law of the Republic of Kazakhstan On State Regulation of Development of Agro-industrial Complex and Rural Areas*, adopted in 2005, with subsequent additions and amendments directed at strengthening of measures of state support to the agricultural sector. This Law summarizes provisions of all the above-mentioned laws and other legislative acts related to measures of state regulation and financial support for development of the agrarian production, including *krestyan* enterprises.

According to the *Law of the Republic of Kazakhstan On State Regulation of Development of Agro-Industrial Complex and Rural Areas*, government support (regulation) of the agro-industrial complex and rural areas development is implemented through such key measures as:

- development of credit policy in the area of the agro-industrial complex and rural areas;

- subsidizing the agro-industrial complex;
- procurement and price interventions;
- provision of technical equipment to the agro-industrial complex;
- information and marketing support;
- scientific, regulatory and methodological support and personnel training;
- investments in the development of social and engineering infrastructure in rural areas;
- ensuring veterinary-sanitary and phyto-sanitary safety; and
- measures of tax, budget, customs and tariffs, and technical regulations and other measures in conformity with legal documents of the Republic of Kazakhstan.

The annual volume of financing for these measures is fixed in the *Law on the Republican Budget and Decisions of Councils on Local Budgets* for a relevant fiscal year. According to Article 10 of this Law, state regulation of the development of credit lending for the agro-industrial complex and rural areas is implemented through budget-funded lending in line with the budget-related legislation of the Republic of Kazakhstan in the following spheres:

- development and establishment of an infrastructure for agricultural production;
- leasing of agricultural machinery and technological equipment;
- organization of lending to credit partnerships involved in credit lending to the agro-industrial complex;
- credit lending to non-agricultural kinds of entrepreneurial activity in rural areas;
- purchase, production, processing and sale of agricultural commodities; and
- establishment of micro-credit for rural residents.

Subsidizing of plant industry, including horticulture and viticulture, is implemented in the following directions:

- cheapening of interest rates with regard to lending credit to farmers;
- conservation and development of the gene pool of plant varieties with a high value;
- development of seed production;
- establishment and cultivation of planting materials of perennial fruit and berry plants and grapes;
- decreasing the cost (down to 40%) of petroleum, oil, and lubricants and other inventories necessary for spring field work and harvesting for priority crops;
- bringing down the cost (down to 50%) of fertilizers (except for organic ones) and cost of treating agricultural crops with herbicides produced (formulated) by domestic producers; and
- partial compensation (up to 40%) of costs for establishment and cultivation of perennial fruit and berry plants and grapes.

The Ministry of Agriculture is in charge of developing the subsidy payment procedure (list of priority crops, subsidy rates, and others) and these rules are approved on an annual basis by the Government. For example, in pursuance of the provisions of the *Law On Seed Production* by Resolution of the Government of the Republic of Kazakhstan dated 11 February 2010, No. 89, rules and regulations of subsidies that

reimburse 100% of farmers' expenses for laying out and maintaining mother nurseries in the following cases were approved:

- laying out mother nurseries of perennial plantations of fruit-berry crops and grape (1,323.7 thousand Kazak tenge); and
- maintaining unfinished production of established mother nurseries of perennial crops and fruit-berry crops and grape (1,126 thousand tenge).

With all of this, state financial support for laying out and growing new orchards and vineyards is the most essential. Since 2007 the Government annually approves the size as well as subsidies for establishing new orchards and vineyards. If in 2007, 800 million tenge (US\$7.2 million) were allocated for these purposes, then, in 2008, 1,551.7 million tenge (about US\$12 million), and, from 2009 to 2011, about 2.0 billion tenge (about US\$ 14 million).

It should be noted that since 1 January 2011 subsidizing activities on improving crop capacity and quality in plant industry will be implemented from local budgets (at the expense of target transfers from the Republican budget), and in this connection some of functions of establishing sizes and payment of these subsidies were handed over to local executive organs. This move has some positive features, taking into account the most complete assessment of specific conditions of production, as well as supply and demand correlation in food markets, of any region of the Republic at present.

For example, new *Rules of Subsidizing*, approved by the Decree of the Government of Republic of Kazakhstan on 4 March 2011, No. 221, determines that standards of subsidies and list of priority crops is now established by decision of local executive organs of regions and Astana and Almaty cities in coordination with competent organs in the field of the agro-industrial complex.

Regulation of water relations and optimization of water resources use for agricultural production is stipulated in the Water Code adopted on 9 July 2003. This document provides for a series of privileges for agricultural producers, including a 40% reduction for irrigation water and maintenance of irrigating mains at the expense of the government. The *Law of the Republic of Kazakhstan On Consumer Cooperative of Water Users* has been adopted to enhance the management of hydro land-reclaiming systems. It provides for the establishment of associations for making use of irrigated areas of farming and *krestyan* enterprises. Intra-farm canals and structures that are part of hydro land-reclaiming systems are categorized as nongovernmental, i.e. private property, and are to be maintained at the expense of owners. The law introduces the notion of "hydro and reclaiming condominium". This is a special form of ownership, whereby a waterworks facility is under common ownership, while adjacent irrigated land is under private ownership.

Special tax treatment

In accordance with the *Tax Code* (2008), a *krestyan* enterprise is entitled to choose the method of tax payment independently. This may be a special tax regime on the basis of a single land tax or a general taxation procedure. The special tax treatment regime for *krestyan* enterprises provides for a preferential procedure of settlements on the basis of payment of a single land tax. It applies to activities of *krestyan* enterprises which produce agricultural commodities, process agricultural commodities of its own production, and effect the sale of its products.

Krestyan farms using the special tax treatment regime do not pay an individual income tax, VAT, vehicle tax, or property tax. They only pay a single land tax, social and individual income tax deducted from the source of payment, mandatory retirement fees paid to savings pension funds, payment for using water resources of surface water bodies, and a tax on environmental pollution. The single land tax is estimated using the rate of 0.1% percentage on the appraised value of a land plot. The appraised value of a land plot (land ownership right) is estimated by territorial land resources management authorities in accordance with approved base payment rates for land plots provided for private ownership.

Other forms of agricultural enterprises also operate under preferential conditions. They operate based on patent, which exempts them from a total of 80% of all types of taxes levied on legal entities.

Microcredits to farmers and households

An important development in the financial support of *krestyan* enterprises is micro-credit. *Krestyan* enterprises and households in rural areas (46% of the total population lives in rural areas) are one of the major segments of micro credit in the Republic of Kazakhstan. The system of micro credit for rural populations is regulated by the *Law of the Republic of Kazakhstan On Micro Credit Organizations* (2003).

In accordance with this Law, a microcredit organization provides microcredits to one borrower in an amount not exceeding eight thousand-fold of the estimate indicator, established by the law that approves the national budget for the respective financial year (in 2011 this was up to 12,300,000 tenge, or US\$ 83,000).

In order to expand access to financial credit resources by the rural population, uncovered at the present time by financial services of the banking sector or by private microcredit organizations, the Ministry of Agriculture implements a budget program on providing micro credit to the rural population. Since 2005 the actual implementation of this program has been carried by JSC “*Fund for Financial Support of Agriculture*”, a financial institution, one hundred percent shares of which are owned by the state.

For 2006-2009, financial means on the order of US\$ 3,275.9 million tenge were allocated to the Fund from the national budget. In this period, 51 micro-credit

organizations (MCOs) with shares of the fund in authorized capital were established in rural settlements of 94 districts. MCO funding is implemented on terms up to three years, at 7.5% per year. MCO requirements for further micro-credit to rural populations: up to 400 thousand tenge at 14.5% per year, on terms up to two years. 2 billion tenge will be allocated to the fund in 2010-2011 from the national budget, from which 1.5 billion tenge will go to directly supplying micro credit and 0.4 billion tenge to support established MCOs.

As a result, the farmers/horticulturists of the southern region of the Republic have access to the services of existing micro-credit organizations and credit partnerships: in the Almaty Province - 25, in Zhambyl - 19 and in southern Kazakhstan - 36. However, according to the new *Strategy of the National Development* which will be in place until 2020, one of the priority directions for supporting individual entrepreneurship in rural areas involves sharply raising the level of development of micro credit in order to increase levels of employment and the incomes of the rural population, which is one of the major factors in strengthening support for farming.

Agrarian insurance

The State provides significant financial support to insurance of activities of agricultural producers. According to the *Law On Krestyan (Farming) Entreprises* the rented and individually owned means of production are insured, as well as the planting of agricultural crops, perennial crops, products, raw materials in case of loss or damage in accordance with active general legislation on insurance. At the same legal, financial and organizational frameworks for the insurance of planted agricultural crops and perennial crops are regulated by the special *Law of the Republic of Kazakhstan On Compulsory Insurance in Plant Industry* (2004). The objectives of compulsory insurance in the crop production industry are:

- protection of property interests of producers of crops from the effects of unfavorable natural circumstances by making insurance payments in the cases, amount and order stipulated by existing Law;
- creating conditions for crediting producers of agricultural plant products against a pledge of insured crops; and
- assisting in increasing the effectiveness of the program of government support for plant industry.

Annually the state allocated up to one billion tenge for these purposes. The list of crops, insured on a compulsory basis according to the above-mentioned Law, however, does not include fruit-berry crops and grape, and therefore they are not currently covered by compulsory insurance. The rationale for the refusal of compulsory insurance suggests that the main plots of these crops are located in many small private households, where accounting and control is complicated, and therefore every household and farmer should insure their crops on a voluntary basis. In this sense the *Law On Mutual Insurance*, active since 2006, stipulates that 104 mutual insurance

companies have been established and are currently functioning in the insurance of risks in crop production.

Krestyan cooperatives and associations

Despite all benefits provided by the state to *krestyan* enterprises, their access to the above-mentioned financial resources (as well as to means of second-tier banks and other financial institutions) is highly limited. The main problem here is ensuring by pledge the required amount of credits and guarantee their return. In these circumstances, it became apparent that there was a need to unite small farmers in different partnerships (associations) and cooperatives, whose activity is regulated by: agricultural partnerships – the *Law of the Republic of Kazakhstan On Agricultural Partnerships and Their Associations (Unions)* (2000); and cooperatives – the *Law of the Republic of Kazakhstan On Production Cooperatives* (1995), *On Rural Consumer Cooperatives* (1999), and *On Rural Consumer Cooperatives of Water Users* (2003), under which farmers can voluntarily enter into a partnership (unions, associations) or create different cooperatives serving the main production system.

Agricultural partnerships are created for:

1. meeting socioeconomic needs of agricultural producers through their voluntary association to arrange for sales, storage, and processing of agricultural products, provision of material and technical resources, water supply and other services to members of the partnership;
2. securing profits of agricultural producers, while the servicing partnerships (cooperatives) operate on a nonprofit basis;
3. creation of a competitive environment for sales, storage, and processing as well as logistics;
4. ensuring direct procurement of agricultural commodities from producer to consumer; and
5. assistance in purchase of necessary resources by agricultural producers at on beneficial terms and access to financing of their economic activities.

Each district *Akimat* (*Akimat* is a local executive authority) has created farmer councils. Decisions are discussed at the *Farmer Council* meetings attended by the most authoritative persons. For farmers engaged in conservation and use of plant genetic resources, the most appropriate form is agricultural service associations, which provide services related to the production and sale of agricultural products for their members, as well as covering common needs in other areas (material/technical and agrochemical services, water and electricity supply, repair and maintenance of equipment, installation of telephones, breeding activities, researches in plant breeding, forest reproduction, among others).

The *Law On Credit Partnerships* adopted in 2003 created a legal framework for the establishment and functioning of rural credit partnerships. The *Agrarian Credit*

Corporation (ACC) founded by the Ministry of Agriculture facilitates the creation of credit partnerships and provides assistance from the state budgets to ensure availability of credit resources. Members of such Rural Credit Partnerships (RCP) may include agricultural producers of different organizational and legal forms, including farmers. The ACC provides 4 *tenge* of credit resources for each *tenge* paid by a member of RCP.

One hundred sixty one RCP were established and are currently active in the country; 6,800 agricultural producers, and 138 rural consumer cooperatives on production and sales, storage, processing and marketing of products cultivated by farmers, as well as agrotechnical service, entered into these partnerships. At present in the southern areas of the country there are 83, or 60% of all existing RCP.

For the period of 2011-2014 it is planned the creation of 455 cooperatives with the financial support of the state, and for this purpose 25 billion *tenge* (about 170 million USD) will be allocated from the budget. The vast majority (60-70%) of the RCP will be in the southern zone, which naturally will include as farmers/horticulturists private households having orchards and vineyards. In turn, agricultural partnerships can unite into associations at regional and national levels. Associations of partnerships are established by primary agricultural partnerships in order to coordinate their activities and protect their economic interests and are non-profit organizations. Members of the association function according to their foundation agreements, while retaining their independence and rights of legal entity. The main functions of the association are:

1. regulation and assistance in the development of associations of agricultural producers;
2. protection of rights and economic interests of the agricultural partnerships;
3. development and implementation of inter-regional relations and improvement of internal and external economic relations;
4. assistance in material/technical support, regulation of equivalence of cross-sectoral exchange and prices for agricultural products and supplied industrial resources;
5. determination of trends in the development of enterprises and, based on this, the development of a common course of further development; and
6. assistance in adoption of new techniques, technologies, organization of exchange of experience, scientific/technical information and organization of patent-licensing work and leasing.

Membership in such associations allows farmers to better participate in decision making and in the development of normative legal acts at regional and national levels.

Enhancement of agrarian legislation

1. The currently established base rates of land purchase are excessively high for agricultural producers, considering their current financial status and earning

- capacity of their production. Therefore, private property is still uncommon in the country.
2. Land is allotted according to the decision of district *Akim* (Governor). Such procedure, when the decision on this issue depends on only one person, does not appear to be effective or fair. There is a need to ensure transparency of the procedure and collective decisions on land allocation to farmers.
 3. The *Law On State Regulation of the Agro-industrial Complex* (AIC) is not a law of direct action. Consequently, state support for agricultural producers (subsidies) is still insignificant and fails to have a considerable impact on outcomes of farming. However, government subsidies on POL (petroleum, oil, and lubricants), fertilizers, seeds, equipment leasing and others are mainly provided to large agricultural producers of grains. At the same time, these funds are virtually inaccessible to small farmers, especially in southern regions, which grow vegetables, fruit, and grapes. There is a need to put in place mechanisms of objective and equitable distribution of government subsidies among commodity producers.
 4. The enforcement of the *Law On Mandatory Insurance in Plant Production* identified a number of serious shortcomings leading to emergencies with disputes among participants of the insurance market. The law works for the benefit of insurance companies rather than agricultural producers. Several amendments were made to enhance this law, but they appear to be insufficient, so a new draft law on insurance is being prepared.
 5. There are no incentives for *Associations of Farmers* for joint sale of produced commodities. Sales areas at wholesale and retail markets are still inaccessible for farmers, leading to proliferation of middlemen who purchase products of rural residents at miserly prices and appropriate the bulk of the profit from reselling the products.
 6. There is no government program for the development of wholesale markets and storage premises for fruit and vegetable produce, so producers incur huge losses. The measures taken locally to address this issue are far from being sufficient. (Poor development of wholesale markets and storage facilities prevents farmers from selling their fruit products at favorable prices, so farmers are unable to increase their income. This also applies to households.)
 7. Problems in the development of collective forms of agricultural enterprises and *krestyan* enterprises were conducive to strengthening the role of households among rural populations to ensure food production for the country. The share of households in total volume of gross agricultural product accounts for 50% (85% in cattle farming), which requires legal formalization of the households through adoption of a relevant law.

Conclusions

The Republic of Kazakhstan has created all necessary legislative and regulatory frameworks for the successful operation and state support to the development of *krestyan* enterprises as equal-right economic entities in the agrarian sector, including

farmers/horticulturists, growing local varieties of fruit crops. The existing legislative framework provides full liberalization of the economy of farm enterprises and creates all necessary legal and socio-economic conditions for their activities appropriate to farmers of developed agrarian countries of the world.

It is, however, obvious that there is a need for a special *Law of the Republic of Kazakhstan in the Area of Conservation and Use of the Biodiversity of Plant Genetic Resources*.

Recommendations

We believe it is important to resolve the following priority issues with regard to strengthening financial support from the government aimed at promoting horticulture and viticulture in the country on the basis of stimulating of their activities in the area of conservation of the gene pool of local varieties of fruit crops.

It is necessary to develop a government program towards motivating farmers to conserve the gene pool of wild fruit crops and local/ancient fruit crops.

The Rules of Using Earmarked Current Transfers on Ensuring the Establishment and Cultivation of Perennial Fruit and Berry Crops and Grapes have been approved by the Government.

However, new requirements for the establishment of perennial plantations of fruit and berry plants and grapes (orchards, berry beds, and vineyards of intensive type) have become a serious impediment for further development of this sector. At present, they should be developed on areas of:

- not less than five hectares;
- with the use of drip irrigation systems;
- with installation of fruit frames: in the case of starting perennial fruit and berry orchards using small-stature form of stock during the first year of establishment and, in the case of cultivating perennial grape plantations, during the second year;
- using varieties included in the *State Register of Breeding Achievements* allowed for use in the Republic of Kazakhstan or in the list of promising varieties of agricultural crops; and
- in accordance with the approved standard design of starting orchards, berry beds and vineyards (that requires soil and ameliorative surveys to determine orchard suitability) developed by a licensed person (to land planning, topographic and geodetic, and cartographic activities) and by agricultural producers tied to a land plot where establishment of an orchard is planned.

It is a fact that these requirements are dictated by the need to merge and create large farms and because farmers need to master new resource-efficient technologies of cultivating fruit and berries. However, in reality these requirements are not only difficult

to fulfill, but also unprofitable for farmers, because the above-mentioned agricultural techniques are sold at a high price. The most important fact is that not all farmers have at least five ha or irrigated land suitable for horticulture and viticulture.

As stated above, only 377 *krestyan* (farming) enterprises have orchard areas of over 5 ha (only 8%). Most other enterprises are unable to expand their irrigated fields to a required size (up to 5 ha), considering the fact that in the country's southern part, such land plots have since long been provided for a long-term lease or sold to private owners.

In addition, according to estimates of many farmers, government subsidies in the amount of 40% of farmers' expenses for starting and maintaining a new orchard over several years until fruit-bearing (on an area of 5 ha and more) do not cover the above-mentioned agricultural techniques (installing drip irrigation, installing fruit frames, or payment for an orchard design developer). Therefore, many farmers - just as large horticultural enterprises - decline these government subsidies.

Considering the above, there is a need to reconsider these requirements since there is an opportunity to gain high yields of fruit and berries using simpler and cheaper technologies. The initiated process of reviving this industry will undoubtedly slow down unless a solution is found for this problem.

Fruit farming and viticulture are part of agriculture with a high extent of risk, which is located in the area of risk-prone agriculture. At the same time, the system of mandatory insurance does not cover fruit and berry farms and vineyards. This issue still remains open despite proposals from scientists and practitioners submitted to the Government for consideration.

There is still an unresolved problem of state subsidies for stump extraction and restoration of old-age orchards and vineyards, most of which have long exhausted their fruit-bearing age and require writing off the farms' balances, especially those of agricultural enterprises that inherited fruit plantations from collective and Soviet farms. For example, an inventory of farms in the Almaty Province, taken in 2009, identified that agricultural enterprises in the Alakol District have not borne fruit for a long time in 67.3% of old orchards (12 ha), in the Zhambyl District, this percentage increases to 85.7% (280 ha), and in the Panfilov District to 94% (265 ha), among others.

Stump extraction and placing areas under fruit and berry plantations under another land category should be carried out on a legal basis. In pre-reform times, the government used to convene a commission that recognized the fact of orchard ageing and drew up a document for its elimination. This document used to be approved at the level of the Ministry followed by extirpation and writing off on the balance sheet as a fixed asset, while the area used to be categorized as arable land.

Currently, however, considering private property rights of farmers with regard to a land plot and its limited area, there is a problem of restoring old-age orchards and

vineyards on the same plots because this requires significant funding unavailable to farmers. Therefore, the establishment of new orchards requires subsidies from the government calling for relevant amendments in the present *Law On State Support of Agriculture*.

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KYRGYZ REPUBLIC LEGISLATION ON SUPPORT TO FARMERS

Koychumanov Baktybek and Sharsheev Bulan

Introduction

Almost 90 percent of the territory of the Kyrgyz Republic lies higher than 1,500 meters above sea level. The climate in the country's different regions ranges widely from sharply continental to almost coastal due to significant roughness of relief and the presence of the large Lake Issyk-Kul. Summers are hot and dry. Winter temperatures, especially in the mountains and craters, are as low as -30 °C and -40 °C. In July, average temperatures range from +25 °C to +37 °C in the Fergana Valley, while at the same time at an altitude of 3,600 meters the temperature does not exceed +4 °C. The highest annual rainfall on the western slope of the Fergana Range amounts to 1,090 mm, the lowest — in the western extremity of Issyk-Kul basin — is 144 mm. Typically, the average rainfall ranges from 300 to 600 mm. As can be seen, the territory of the Kyrgyz Republic is categorized as a zone of high risk agriculture.

According to the *Rome Declaration on World Food Security* adopted on 17 November 1996, Kyrgyzstan assumed an obligation as a member of the global community to “implement policies aimed at eradicating poverty and inequality and improving physical and economic access by all, at all times, to sufficient, nutritionally adequate and safe food and its effective utilization.”

In recent years, the Republic achieved significant progress in its agrarian land reform, established a regulatory framework for the development of private farms and ensured an annual increase in gross agricultural production by 6 percent on average. In 2008, the private sector produced over 90 percent of agricultural products, whereby the share of *krestyan* farming enterprises amounted to more than 44 percent. More than 286,000 *krestyan* (farming) enterprises and 700 associations, including 462 cooperatives, were established. This resulted in self-reliance in terms of certain food products to facilitate attainment of key country food security objectives at the level of minimal demand of the population.

Despite a number of problems, Kyrgyzstan is presently able to meet demand for basic agricultural products including meat, milk, vegetables, and to some extent grain. At the same time, poor quality of produce, permanent increase in demand and prices of foods, insignificant export and increasing food imports prevent overall food security from meeting demand standards.

The Kyrgyz Republic is unable to fully ensure staple foods such as sugar and vegetable oil. The country fails to sustain competition or to grow wheat, whose quality does not meet high standards, leading to flour or durum wheat imports from Kazakhstan.

In the course of agrarian land reform, former collective farms were replaced, as mentioned above, with more than 286,000 *krestyan* (farming) enterprises, approximately 700 associations and cooperatives. They now own more than 87 percent of all land. At the same time, the absolute acreage of created farms is limited in size; they are ineffective as economic units.

As much as practicable, the Government of the Kyrgyz Republic has been supporting farmers through allocation of seeds, material and technical resources, commodity credits and grants. The national budget annually plans for funds for repair and rehabilitation of water management facilities, plant protection and quarantine, and improvement of the epi-zootological situation. *Rural Consultation Services* (RCS) and the *Kyrgyz Agrarian Market Information System* (KAMIS) put in place in all regions have played a key role in providing farmers and peasants with necessary information.

Legal framework for *krestyan* (farming) enterprises development

Land reform in the Kyrgyz Republic began as soon as the country became independent in 1991. The land that had been formerly used for collective farming was provided by the government to rural residents for free use for 99 years. Later, after the further development of land reform, amendments were introduced into the existing land legislation to result in the gradual handover of arable land to private property with observance of established principles.

Upon completion of land reform, the Kyrgyz Republic can be said to have created a specific framework for the development of private farms on owned land, but the laws have set forth limitations in the acquisition of rights to ownership, possession, use and disposal. These limitations are designed primarily to protect the integrity of the country (e.g., prohibition of land sales to foreign nationals), environment (e.g., prohibition of use of hazardous chemicals), biological diversity (e.g., prohibition of introduction of certain plant species that can cause damage to endemic plant species) and protection of socially vulnerable populations (e.g., the principle of transparent allocation of land plots depending on the composition of the family).

Regulations in the *Civil Code of the Kyrgyz Republic* (Articles 82-1, 82-2) outline key concepts and legal status of farms and farm establishments and registration procedures. There is a following registration provision: "In case a *krestyan* (farming) enterprise is established as a legal entity, it is considered a commercial organization". Thus, farming enterprises unregistered with justice agencies as legal entities are considered enterprises within the social area, rather than commercial organizations,

because land under ownership by a family as well as opportunities to grow vegetables and fruit play a role in social security and serve as a source of food and livelihoods for many rural residents.

Law No. 47 of the Kyrgyz Republic *On Krestyan (Farming) Enterprise*, dated 3 June 1999, regulates key issues related to the establishment and operation of *krestyan* enterprises. The law outlines the category of entities that have the right to establish a *krestyan* enterprise, includes mandatory requirements for their establishment as an autonomous legal entity, its governing body (general meeting of farm members), exclusive competencies, competences of the head of the *krestyan* enterprise, and rights and obligations.

Article 82-1 of the *Civil Code of the Kyrgyz Republic* states that “a *krestyan* (farming) enterprise is an independent economic agent having the status of a legal entity or operating without forming a legal entity, whose activity is predominantly based on personal labor of members of one family, relatives, and other persons jointly managing agricultural production on a land share or using other assets belonging to members of a *krestyan* farm under a joint ownership or leasehold basis.”

A *krestyan* (farming) enterprise (hereinafter *krestyan* enterprise) is a commercial organization if it is established as a legal entity. Article 82-2 of the *Civil Code of the Kyrgyz Republic* outlines the procedure for the establishment and registration of a *krestyan* enterprise:

1. a *krestyan* (farming) enterprise shall be established strictly on a voluntary basis. Members of a *krestyan* farm shall have a right to leave the *krestyan* farm without hindrance; and
2. a *krestyan* farm shall be subject to state registration as a legal entity with the justice authorities or in accordance with rules set forth in the legislation of the Kyrgyz Republic for individual entrepreneurs in case a *krestyan* farm is established without forming a legal entity.

According to the (1999) *Law On Krestyan (Farming) Enterprise*, a *krestyan* enterprise implies the following features:

1. a *krestyan* (farming) enterprise (hereinafter *krestyan* farm) is an autonomous economic entity having a status of a legal entity or operating without forming a legal entity, whose activity is predominantly based on personal labor of members of one family, relatives, and persons jointly managing agricultural production on a land-share or using other assets belonging to members of a *krestyan* farm on the basis of joint ownership or leasehold.
2. *krestyan* farm members include spouses, children, parents, relatives and other persons jointly managing the farm. A person working for hire in agriculture whose labor relations with a *krestyan* farm are regulated under the *Law of the Kyrgyz Republic on Labor* shall not be considered as *krestyan* farm members. A *krestyan* farm may consist of one person.

3. the name of a *krestyan* farm shall contain the words “a peasant (farming) enterprise”.

The Law entitles every citizen of the Kyrgyz Republic to establish a farm. A mandatory requirement for a farming enterprise newly established as an independent legal entity are the Statutes of a *krestyan* farm, which shall contain the following:

1. name of the farming enterprise;
2. location of the farming enterprise;
3. subject and aim of activities of a farming enterprise;
4. information about the land plot of a farming enterprise with an indication of entitlement documents;
5. information regarding the farm members, competency of the farm management body, and relevant decision-making procedure;
6. data about all members of the farming enterprise;
7. rights and responsibilities of members of the farming enterprise;
8. a procedure for admitting new members of the farming enterprise;
9. a procedure of profit and loss sharing in the farming enterprise;
10. a procedure and conditions for cessation of membership in the farming enterprise;
11. provisions regarding responsibilities for liabilities of the farming enterprise;
12. a procedure and conditions for restructuring or dissolution of the farming enterprise; and
13. other provisions in line with the legislation of the Kyrgyz Republic.

The general assembly of farm members entitled to resolve any issues pertinent to the activities of a farming enterprises including approval or repeal of decisions made by the head of a farming enterprise and acting as an executive body of a farming enterprise shall be considered as the superior management body of a farming enterprise established as a legal entity. The following have been set forth as exclusive competencies of the general assembly of farm members:

1. approval of the *krestyan* enterprise statutes and making of amendments;
2. election and dismissal of the head of the farming enterprise;
3. income sharing and consideration of issues related to losses of the farming enterprise; and
4. restructuring and dissolution of the farming enterprise.

Competencies of the head of a farming enterprise include: representing interests of the farming enterprises in the relations with citizens, legal entities, and state authorities; organization of economic activities; concluding agreements; hiring and dismissing workers; issuing of powers of attorney; management of assets and funds; and other legal actions related to the operation of a farming enterprise. The head of a farming enterprise is mainly responsible before other farm members for incorrect management of the joint estate. In case of failure to fulfill obligations related to management of farm assets or inability to further fulfill these obligations, he/she may be relieved of his/her duties in line with the decision of the general assembly of able-bodied members of the farming enterprise.

According to the Law, a farming enterprise is entitled to:

1. carry out all types of activities envisaged under the present Law and other activities consistent with the legislation of the Kyrgyz Republic;
2. autonomously manage economic activities, ascertain areas and types (seed selection, seed procurement, other expenses are within the competency of farmers);
3. own, purchase or otherwise acquire, sell, pawn and exercise other proprietary rights over assets according to procedures and under conditions set forth under the legislation of the Kyrgyz Republic and the statutes;
4. a right of ownership to plantations of agricultural crops, plantations of perennial and fruit, ornamental and other plants, houses, production facilities, cultural and public amenities, and other buildings and structures;
5. conclude agreements and exercise all rights necessary to achieve targets outlined in the statutes of the farming enterprise;
6. obtain loan funds;
7. use deposits of common natural resources and water bodies available on the land plot for economic purposes in line with the legislation of the Kyrgyz Republic and tap into other useful land properties;
8. erect buildings and structures in line with applicable regulations;
9. autonomous management of produced goods and revenues from sale;
10. duly engage in ancillary activities and food processing;
11. take part in establishing cooperatives and associations, in line with the law, and exercise relevant rights subject to applicable regulations;
12. create an emergency reserve and other funds for a farming enterprise, deposits funds at banks and other credit agencies, invest in securities and other assets;
13. carry out foreign economic relations consistent with the legislation of the Kyrgyz Republic; and
14. restructure and liquidate a farming enterprise among others.

The responsibilities of a *krestyan* enterprise include:

1. effective land management in line with their designation, increasing soil fertility, application of agricultural practices, preventing aggravation of the environmental situation as a result of economic activities, taking a complex of measures envisaged in the legislation of the Kyrgyz Republic to protect land; (a legislator prescribed protection of land fertility as the main obligation of a farmer, while seed selection is dictated by the need of the farmer and the market);
2. making timely land tax or land lease payments and other mandatory payments;
3. avoiding violation of rights of land owners and users on adjoining land plots;
4. complying with architectural planning, building, environmental, sanitary hygienic, fire control, and other special requirements during construction on the land plot; and
5. observing regulations for use of land, forest, water, and other natural resources.

Ownership of land by a *krestyan* enterprise implies the following:

1. farm property shall belong to farm members in line with their right of joint ownership unless an agreement between them provides otherwise;

2. a farm may own land, houses, farm buildings, plantations on the land plot, productive and working cattle, poultry, machinery and implements, vehicles and other property handed over by farm members pursuant to an agreement and acquired for the farming enterprises at the expense of shared funds of its members;
3. a *krestyan* enterprise has the right of ownership to produced goods as well as revenue from sales to be used at its own discretion;
4. personal incomes and savings of farm members as well as property acquired by them using their own funds or funds received from others in line with Kyrgyz legislation and not transferred to the ownership of the farm shall be the property of those persons;
5. farm assets shall be inherited by persons who are legal heirs or specified in the will in the manner prescribed in the legislation of the Kyrgyz Republic; and
6. farm property, which may not be levied upon claims of creditors, shall be specified in the legislation of the Kyrgyz Republic.

Herewith, the government guarantees respect for rights and legal interests of farmers and farm members. State authorities and local self-governing bodies are mandated to promote the development and strengthening of farming enterprises and may not interfere with economic, financial, and other activities of farms with exception of cases set forth in the legislation of the Kyrgyz Republic.

At present (after the April Revolution of 2010 and the introduction of the parliamentary form of government in the country at the general referendum), there is an ongoing enhancement of the regulatory framework of public administration and local self-governing bodies. Therefore, proposals regarding the improvement of the *Law on Local Self-Government and Local State Administrations* will not be supported by the government.

A summary of findings from the analysis of key legal instruments in the area of development of farming enterprises in Kyrgyzstan is shown in Table below.

Lessons learned towards agricultural biodiversity conservation on farm

The key lesson learned from the implementation of the project is a systematized approach, which implies covering issues of *in situ*/on farm conservation, utilization and distribution of plant genetic resources (PGR), protection of farmers' rights in question through a comprehensive analysis of the national legislation and the experience of international organizations as well as the need to harmonize national regulations, and rules for the development of regional cooperation for these matters.

In addition to the analysis of legislation, there was a scrutiny of laws and regulations of the Kyrgyz Government that govern relations in the area of supporting farming enterprises and agricultural producers regarding the aforementioned issues.

Analysis of Legal Regulatory Instruments Governing Farm Development in the Kyrgyz Republic

Document Title	Date of Adoption	Area	Efficiency	Shortcomings/Weaknesses
The Law of the Kyrgyz Republic <i>On Plant Quarantine</i>	27 June 1996, No. 26	Outlines general legal frameworks for plant quarantine, activities of state bodies, enterprises, agencies, organizations, officials and citizens aimed at preventing importation and distribution of quarantined pests, diseases, and weeds in the Kyrgyz Republic	Sets forth importation and exportation procedures from/to the country of sub-quarantined plant species. Outlines responsibilities of officials and citizens in relation to fulfilling quarantine requirements as well as key functions of state bodies.	This law is designed to be used only by one agency – the State Service for Plant Quarantine. It is missing regulations that protect rights of farmers who have incurred losses due to the introduced quarantine. There are no criteria for classifying plant species as quarantined ones (plants and weeds).
The Law of Kyrgyz Republic <i>On Seeds</i>	19 June 1997, No. 38	Defines key provisions governing the production, certification, marketing and use of seed and planting material of all plant species, provides legal basis for activities of the seed producers and regulates their relationships with other persons and entities in seed production.	Sets forth procedures for production, certification, sale and use of seed and planting material, putting high-quality seeds into production.	This law is lacking criteria for classification of varieties as economically beneficial, plant hybrids for various soil and climatic zones in the country, requirements for distinguishability, homogeneity, stability of new varieties, and a list of crops that are mandatory for field testing to be allowed for use in the territory of the Kyrgyz Republic. This Law does not include provisions regarding conservation of genetic resources, while the concept of a “local variety” is missing.
<i>Land Code</i> of the Kyrgyz Republic	2 June 1999, No. 45	Regulates land relations in the Kyrgyz Republic, grounds for origin, exercise and dissolution of rights to land and their registration.	Aimed at creation of land-market relations under conditions of state, municipal and private ownership of land and sustainable land use and protection.	Lacking norms that promote cooperation between farming enterprises, household management aimed at production of environmentally clean products and measures for conservation of natural plantations of wild relatives of fruit crops.
<i>Civil Code</i> of the Kyrgyz Republic	8 May 1996, No. 15	The Civil Code of the Kyrgyz Republic includes a procedure for the establishment and operation of a <i>krestyan</i> (farming) enterprise	Regulations relations between legal and physical entities in line with civil law procedures	Mechanisms for providing privileges and state support are operating in an unsatisfactory manner.
Law of the Kyrgyz Republic <i>On Krestyan (Farming) Enterprises</i>	3 June 1999, No. 47	Regulates key issues relating to the establishment and operation of farming enterprises	Provides for a legal framework for the establishment and operation of farms. Lists rights and legal interests of and mandatory requirements for farms, the highest governing body of the farm, the state authorities and local self-governing bodies.	Fails to reflect a mechanism to address problems associated with the establishment and operation of a farm, has insufficient mechanisms to provide incentives and government support. Articles of the aforementioned law have references to regulations such as “in the prescribed manner, in accordance with the Civil Code, the Tax Code, and so on”, which make it difficult for farmers to directly understand laws that concern farms.

Measures taken by the Government of the Kyrgyz Republic to develop agriculture and to ensure food security are noteworthy. For example, Resolution No. 465 of the Government of the Kyrgyz Republic dated 22 June 2004 approved the *Concept of Agrarian Policy for the Kyrgyz Republic until 2010*, Resolution No. 116 of the Government of the Kyrgyz Republic dated 11 February 2009 endorsed a *Program of Actions for the Government of the Kyrgyz Republic*, where a section on the *Agricultural Sector and Food Processors* provides for development of a system of state assistance for agricultural development aimed at supporting rural commodity producers such as:

- procurement of agricultural machinery at the expense of grant funds from the Governments of Japan, People's Republic of China, and other donors;
- development of rural advisory services for agricultural practices, marketing, etc. through the establishment of centers;
- support for financial status of rural commodity producers through writing off bad debts, state loan debts and foreign loans for 1992-2007;
- introduction of subsidized expenses of seed producers, which manufacture and sell super-elite and elite seeds; and
- expansion of cropland acreage for agricultural crops to 1,165,000 ha and extension of land planted to wheat to 420,000 ha.

It is hoped that the comprehensive measures the leadership of the country is taking to develop the agricultural sector based on best international practices will enable the ensurance of food security in the country. In line with the aforementioned decisions, the measures are designed to develop the agricultural sector in its entirety as a key player in ensuring food security at large.

There is a need for a new decision of the Kyrgyz Government to motivate farmers to maintain local varieties and plant genetic resources. The Government decision should aim at strengthening the responsibilities of local governments and local self-governing bodies in dealing with violations of farmers' rights and rights that have been put in place to support agricultural producers of fruit crops. The *Law of the Kyrgyz Republic On Krestyan (Farming) Enterprises* should include norms that provide for support of agricultural producers. In the case that farming enterprises are protected from weather-related and other negative circumstances unrelated to the actions of farmers, farming enterprises may engage in on farm propagation of fruit crops and their wild relatives.

There is a need to develop a standard statues for *krestyan* enterprises regarding procedures for state registration of a legal entity and establishing its rights and obligations, since reluctance to spend time on state registration and unclear awareness of benefits for a farming enterprise is one of the factors inhibiting the development. There is also a need for a decision by the Kyrgyz Government on state support for farmers engaged in on farm propagation of fruit crops and their wild relatives because, according to the *Constitution of the Kyrgyz Republic*, the Government is to resolve all issues except those attributed to the competency of the Parliament and the President. Other government agencies are unauthorized to make such decisions.

At the regional level and towards improved regional cooperation, it is expedient to work on harmonizing national legislation in Central Asian countries that govern relations in the area of *in situ*/on farm conservation, use, and distribution of local fruit crop varieties and their wild relatives.

Conclusions

It is worthwhile noting the benefits of the legal framework that the Kyrgyz Republic has put in place such as the framework for the development of private farms on owned land. There is a chain of interrelated legal acts that lay the legal foundation for the establishment and operation of a farming enterprise in civil, agricultural, and land legislation. They clearly outline rights and responsibilities of a *krestyan* enterprise, the head of the enterprise, state agencies and local self-governing bodies. They also reflect norms that govern relations in the area of civic associations.

The following include shortcomings of the legal framework:

- legal instruments regulating relations concerning the development of a *krestyan* enterprise fail to reflect a decision-making mechanism within the enterprise, while mechanisms of providing state support to rural producers have not been fully elaborated.
- articles of the said instruments provide reference that are difficult for farmers to understand and difficult for farmers to directly use the legislation dealing with farming enterprises. “Patching up” of legal regulatory instruments – amending and supplementing the existing legislation – under the sweepingly changing conditions of a free market fails to keep up with the required rate of support for the development of this area and meet the requirements of the farming enterprises.

It is recommended to profoundly and comprehensively investigate all issues and problems in agriculture with assistance from consultants and agro-sector experts, including international ones, in order to enhance the legislation that governs issues related to the development of *krestyan* (farming) enterprises. This is also necessary in order to work out the conceptual provisions for further development of the country’s agro-sector under modern conditions as well as revise the regulatory legal framework with regard to development areas.

Recommendations

It is necessary to include amendments about preferences and support of agricultural producers, especially farmers engaged in on farm distribution of ancient varieties of fruit crops and their wild relatives in the *Law of the Republic of Kyrgyzstan On Krestyan (Farming) Enterprises*.

It is important to develop the normative and legal acts approved by decisions of the Government of the Republic of Kyrgyzstan, on granting non-interest bearing loans and privileged credits up to 10 years (before fruit collection) and other state support of farmers engaged in on farm distribution of fruit crops and their wild species.

To encourage the cultivation of ancient varieties of fruit crops and their wild species, it is necessary to include amendments to the *Law of the Republic of Krygyzstan On Local Self-Government and Local State Administrations* and to develop specialized programs of development (national, regional) and other sub-legislative normative acts directed to the support of the protection of farmers' rights and expansion of possibilities for farmers/agricultural producers of fruit crops by local authorities and local authorities.

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REPUBLIC OF TAJIKISTAN LEGISLATION ON SUPPORT TO FARMERS

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Introduction

Tajikistan is a highly agrarian country with a rural population of more than 70% of the total and agriculture accounting for 60% of employment and around 30% of Global Domestic Product (GDP). Agriculture in Tajikistan is under transition to a market economy and reforms are an ongoing process. Land in Tajikistan remains in exclusive state ownership and cannot be privatized, but use rights on the land can be transferred to private users. A land user can lease land, receive land for use for an unlimited time or for life with the right to bequeath it.

Land reform in Tajikistan started in 1992 with the aim of achieving higher production levels through reallocation of state-owned agricultural land among individual producers. The dominance of large corporate farms has shifted to new farm structures – the so-called *dekhkan* farms, that can be individual, family farms, or collective *dekhkan* farms. As a result of land reform, there has been an important increase in individual and family *dekhkan* farms and household plots that account for more of 45% of total arable land in the country.

While Tajikistan is a cotton-growing country, this individualization of land has led to a change in the cropping structure, with an increase of land dedicated to crops other than cotton as, for example, grains and horticultural crops.

Tajikistan holds a rich diversity of flora and is recognized as one of the centers of origin and diversity of agricultural crop species. Due to the geographic characteristics of the country, there are about 5,000 plant species, including 650 endemic species and 3,000 species of lower plants. This flora of Tajikistan offers a wide variety of plants used for food and agriculture, including both wild plants and landraces. Of special importance is the high diversity of fruit crops like pistachio, apricot, pear, apple, almond, walnut, fig and pomegranate. In particular, the local gene pool of apricot currently includes more than 300 identified varieties and forms.

However, there has been a loss in agricultural diversity of local crops during the last few decades due to the introduction of improved varieties. None the less, this diversity of genetic resources provides the sustainable basis for food supply and security of the country.

The Republic of Tajikistan has an operating genebank valid for *ex situ* conservation of genetic resources of improved and ancient varieties and wild crop relatives, but there is no mechanism or legal framework for distribution of genetic resources, while limited resources prevent full-fledged propagation and support of genetic resources conserved in genebanks. It is hoped that after completion of construction of new genebank building and use of equipment for short and long-term storage at the National Republican Center for Genetic Resources, farmers and breeders will be able to easily obtain necessary germplasm.

Legal framework for *dekhkan* (farming) enterprises development

The definition of *dekhkan* (farming) enterprises, (hereinafter *dekhkan* enterprises) in the legislation of the Republic of Tajikistan appeared with adoption of two national laws, *On Land Reforms* of 15 May 1992 and *On Dekhkan (Farming) Enterprises* of 5 March 1992. Before adoption of these laws in the *Land Code* of Republic of Tajikistan (15 December 1990), the term “peasant enterprises” was in use. These enterprises were based on individual labor or labor of family members, which means that according to legislation, this type of enterprise was based on only family labor.

The 1992 *Law of the Republic of Tajikistan On Land Reforms* is aimed at the creation of equal rights for development of different forms of enterprises and at the rational use and protection of land in agricultural production. In support of land reforms are a set of legislative, economic and organizational-technical activities, representing the transition to new legal relations.

In order to implement land reforms, it was necessary to ensure farm activities in the rural areas. One of the main aims of land reform was to allocate land plots to citizens for the establishment of *dekhkan* enterprises for an unlimited period. The 1992 *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises* defines the economic, social and legal basis for the organization and activities of a *dekhkan* enterprise and for associations of farms in the territory of the Republic. The law guarantees the right of citizens to establish a *dekhkan* enterprise in the territory of the Republic and also their economic independence, activities, legal interests and right to free cooperation.

According to this law, a *dekhkan* enterprise is an independent entity with legal rights to produce, process and sell the agricultural products produced on its own land. The *dekhkan* enterprise represents a form of independent enterprise, realizing its activities based on principles of economic benefits and formed by work-capable family members and other citizens engaged in joint farm activities. Thus the members of *dekhkan* (farming) enterprise can be also other citizens who are not family members. *Dekhkan* enterprises are registered at the local notary office after submission of the certificate for unlimited use of the land plot or the land leasing agreement. After registration, the *dekhkan* enterprise will have the status of a legal person.

Since the beginning of the reforms *dekhkan* enterprises showed their advantage, in spite of shortage of techniques for land works, lack of harvest processing, financial resources and assistance, unclear ways for commercialization of agriculture products and absence of strong relations with partners. Improvement on these matters required the development of additional regulations.

The new *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises* was adopted on 19 May 2009. This law clarified the meaning of *dekhkan* enterprises. According to Article 7 of the law, the *dekhkan* enterprise is an independent business entity, implementing its activities without status of legal person. It is based on individual labor of one person or labor of his family members and other persons, jointly producing agricultural products, in land plots or other property, belonging to *dekhkan* enterprise members. Thus, *dekhkan* enterprises stopped of being legal persons and became an independent business entity, implementing its activity without status of legal person.

According to the new *Law On Dekhkan (Farming) Enterprises (2009)*, every legally able citizen of the Republic of Tajikistan has the right to establish a *dekhkan* enterprise. For ensuring rational and effective use of lands and the successful business activity of *dekhkan* enterprises, the new law introduces several models (types) of structures of *dekhkan*. The *dekhkan* farm can be in following forms:

- a. *dekhkan* enterprise based on individual entrepreneurship;
- b. *dekhkan* enterprise based on the family business and joint property; and
- c. *dekhkan* enterprise established as ordinary collaboration based on common property and on agreement of joint business activity.

The *dekhkan* enterprise independently determines the structure and mode of production, taking into consideration its interests. It can be engaged in any kind of activity unless it is prohibited by the legislation and organs of government shall not interfere with the economic activities of the *dekhkan* enterprise except on the grounds prescribed by the law.

State registration of *dekhkan* enterprise is implemented at the tax department. The *dekhkan* (farming) enterprise is also recorded at the local department of statistics after issuance of the certificate of the right to use of the land plot.

Agricultural associations and production cooperatives, established in accordance with the legislation of the Republic of Tajikistan, also have to be registered with the local legal authorities and need to be recorded at the local statistics department. Rural *jamoat* (council) registers any *dekhkan* enterprise, productive association or cooperative in the register, where the main data on the entity is entered (Article 22).

The *dekhkan* enterprise and its members have the right to:

- a. independently manage the land;

- b. lease out the land or part of the land in case of temporary invalidity, military draft, studies and in other cases prescribed by the law of the Republic of Tajikistan;
- c. receive full indemnification of the costs used to increase the land productive capacity and the losses, including foregone income, in case the government withdraws the land;
- d. be the proprietor of the resulting production and of income received from its sale;
- e. voluntarily refuse the land use by consent of its members;
- f. use mineral resources (sand, road metal, clay, stones, water springs) and other useful properties of the land of the *dekhkan* enterprise;
- g. acquire, lease or temporarily use the property of other organizations and individual citizens;
- h. conclude agreements on implementation of business activity;
- i. build a utility room (field camp) in accordance with Land Code;
- j. in pawn the right on the land plot use with agreement of the members of the *dekhkan* enterprise; and
- k. have other rights as prescribed by the legislation of the Republic of Tajikistan.

The members of the *dekhkan* enterprise have the right to:

- a. independently consent other members to leave the *dekhkan* enterprise according to his (her) land share;
- b. receive full indemnification in the case that severance of the property is not possible;
- c. according to the share, to establish his (her) own *dekhkan* (farming) enterprise;
- d. transfer his (her) land share to other persons;
- e. in pawn the right to the use of his (her) land share;
- f. participate in distribution and sale of the produced agricultural products, receive his (her) share of income; and
- g. have other rights as prescribed by the legislation of the Republic of Tajikistan.

Additional land plots can be allocated to a *dekhkan* enterprise, for terminal use or for lease from the lands of the following categories:

- a. category of agricultural lands: newly developed lands, unused lands, lands with non-operational irrigation facilities, lands unprepared for crop rotation, and lands not allocated to citizens as their share;
- b. category of lands of State Land Reserve and State Forest Fund, cultivable in agricultural production, for use as rangelands for grazing, depending on the number of animals.

Together with rights, *dekhkan* enterprises have also obligations. The *dekhkan* enterprises and its members using the land are obliged to:

- a. efficiently use the land in accordance with the target, increase its fertility, implement a complex of measures on protection of land, wood, water and not allow deterioration of the environment as a result of economic activities;
- b. pay rent and other taxes for the land use in due time;

- c. carry out crop rotation and water use in irrigated lands according to the water use plans and depending on the crop types; ensure cleaning the drainage system, being on the balance of the *dekhkan* (farming) enterprise;
- d. not allow deterioration of the environment as a result of economic activities;
- e. pay land tax and other taxes for the land use on time, defined by the legislation of the Republic of Tajikistan;
- f. make payments for water use, electricity power and other payments;
- g. distribute the wages and income in defined time;
- h. keep accounting system;
- i. take actions on animal and plant disease control;
- j. in due time, to submit information on land status and use to local (districts, town) agencies on land planning and statistics;
- k. cover the losses for diminishing returns due to actions of the land user;
- l. respect contracts and credit-accounting discipline; and
- m. not infringe the rights of other land users.

In accordance with the 2009 *Law On Dekhkan (Farming) Enterprises*, the farmer has the right to independent management of the land, including independent decision making on selection of which agricultural products to produce. Farmers' private production in the Republic of Tajikistan should be independent and able to more efficiently sell products and enrich the market.

The Law also foresees the following measures in support of *dekhkan* enterprises:

- a. free state registration of the *dekhkan* enterprise;
- b. exemption from the charges for connection to electricity lines, installation of water supply equipment (without use of construction and technical equipment), according to the terms and conditions prescribed by the Government of the Republic of Tajikistan;
- c. exemption from service payments when opening accounts in commercial banks;
- d. receipt of privileged credit from commercial banks;
- e. priority rights for public contracts with the Government;
- f. improvement of professional skills of its staff paid from the funds allocated to support small and medium-sized businesses; and
- g. other privileges as prescribed by the legislation of the Republic of Tajikistan.

Moreover, in many forecasts of social development in Tajikistan, concepts, strategies, programmes and work plans provide measures for improving the conditions for development of *dekhkan* enterprises. However, currently these actions are at the implementation stage and new privileges for *dekhkan* enterprises have not been developed yet.

Dekhkan enterprise also have the right to create their associations. The associations are established through voluntary membership of *dekhkan* enterprises. Associations function on the basis of the deed of foundation and the charter adopted by its members. It is a legal person and registered with local legal departments. *Dekhkan*

enterprises joining an association keep their independence and the right to land use. Executive functions and coordination activities of an association of a *dekhkan* private production system serve to establish an association council and appoint a management chairman. The association council is elected in a meeting of members. An association has the right to carry out the following tasks to realize its goals to:

- implement joint activities, agreed among its participants, in the sphere of commerce, finance, credit and technical development;
- develop financial and material resources through voluntary contributions and to centralize production-related tasks; and
- regulate prices, tariffs and relations among its members through control of settlement prices.

The association of *dekhkan* enterprises does not bear responsibility for its individual members' obligations unless the association acts as a guarantor. In turn, the members do not have an obligation to meet the association's responsibilities. The procedure for resignation of members and liquidation of the association is defined in the charter of the association.

Members of individual *dekhkan* enterprises or members of a family of *dekhkan* enterprises, according to the Civil Code, can establish production partnerships or agricultural cooperatives with the status of juridical entities based on household property. Establishment of a production partnership or agricultural cooperative with the status of juridical entity is made upon written agreement of members of *dekhkan* enterprise. The right of the member of the *dekhkan* enterprise to lifelong inheritance of a land plot in case of the establishment of a production partnership or cooperative is conveyed to the partnership or cooperative for unlimited duration. However, the members of the *dekhkan* enterprise can make a decision to keep the right of each member for his (her) land share for unlimited duration when establishing the production partnership or agricultural cooperative. The production partnership or agricultural cooperative as a legal entity has an ownership right to the property produced as a result of its activity or obtained by other means that are not inconsistent with the legislation of the Republic of Tajikistan.

The laws of the Republic of Tajikistan are directly promulgated in accordance with the *Constitution* of the Republic of Tajikistan and do not require additional measures. Currently, a complete legislative base was developed that regulates activities of *dekhkan* enterprises.

In the past, the functions and authorities of regulating institutions were not clearly identified, which led to violation of the law on transparent and simplified procedures of registration of rights to land and tax. The laws of the Republic of Tajikistan stipulate opportunities to establish associations of farm enterprises using land, water, technology, etc., as well as structuring and providing services to land owners, namely protection of farmers' rights and their production. However, these farmers' privileges are not applicable because of low awareness of peasants regarding land reforms and

available resources. Moreover, the farmers are not aware of all their rights as citizens of the Republic of Tajikistan. As a result they do not have legal protection and they cannot write complaints to local and state authorities or to authorities of higher institutions.

Civil Code of the Republic of Tajikistan

The *Civil Code of the Republic of Tajikistan* was adopted on 30 June 1999, stipulating that citizens have the right to be engaged in entrepreneurial activity without juridical oversight, and they are exempt from state tax. In accordance with Article 432 of this Code, a land plot or a portion thereof belonging to the *dekhkan* enterprise, and also a land plot necessary for complementary enterprises in minimal parts as stipulated by the legislation of the country, are not subject to penalties by the decision of the court.

The civil law defines the legal status of participants of civil transactions, the grounds and procedure of establishing and implementing ownership titles and other proprietary rights, as well as intellectual property rights, regulates contractual and other obligations and other property and pertinent personal property relations based on equality, autonomy of will and ownership of property of these participants.

Family and labor agreements, relations in the area of use of natural resources and environmental protection that meet requirements referred to in the first paragraph of this section shall be regulated by the civil law, unless laws on family, labor, land and other special laws stipulate otherwise. The participants of the relations regulated by civil legislation include citizens of the state, legal persons and territorial and administrative units.

Tax Code of the Republic of Tajikistan

The *Tax Code of the Republic of Tajikistan* was adopted the 3rd of December 2004 on the basis of and in accordance with regulative acts and international treaties recognized by the Republic of Tajikistan. Tax benefits are granted to certain categories of taxpayers, stipulated by the *Code* or international treaties recognized by the Republic of Tajikistan.

The *Tax Code of the Republic of Tajikistan*, establishes that agricultural producers who are subject to a flat-rate tax on agricultural activities, are exempted from the following taxes:

- value-added tax on supplying agricultural products, cultivated on farm land and on which a single tax was imposed;
- tax for users of highways to supply agricultural products on which a direct tax was imposed;
- tax on income of juridical persons;
- minimal tax on enterprise income;
- land tax; and
- tax paid under a simplified system;

The total amount of flat-rate tax to be paid is multiplication of the size of the land plot used by the agricultural producer and established flat-rate tax per area unit. The income of *dekhkan* enterprise, which is not a legal person, is subject to a flat-rate tax, but is exempted from income tax.

Members of *dekhkan* enterprise (not legal persons) are liable for social insurance and to payment of the social insurance tax. However, income is exempted from income tax. The social insurance tax is paid by the agricultural producer at the same time that the flat-rate tax is paid. In the case natural disaster or catastrophe, the Government can decrease the flat-rate tax rate for agriculture producers or certain categories of tax payers.

Conclusions

During the analysis, the following issues were identified towards the development of a strategy to support farmers development of native fruit crops:

- difficulties in registration for land users;
- issues related to taxation;
- lack of clear roles and functions of authorities;
- lack of awareness of members of farm enterprises about their rights;
- interference of executive authorities in the activities of *dekhkan* enterprises;
- lack of awareness of members of farm enterprises about reforms in the sector;
- low customs taxes for importation of agricultural products;
- lack of agricultural machinery and equipment for tillage, harvesting and processing of harvests;
- issues related to allocation of privileged subsidies and financial assistance to farmers; and
- absence of strong linkages with processing enterprises.

Recommendations

As a result of the analysis realized, the following measures are recommended in the promotion of fruit crops:

- develop mechanisms for protection of wild fruit species, if they exist on the land plot allocated to *dekhkan* enterprise;
- specify the rights and obligations of farm enterprises with regard to wild fruit crops;
- develop procedures for possible transplanting of wild fruit crops to other areas or exchange and withdrawal of land plots where the wild fruit crops grow;
- develop procedures for monitoring the status of wild fruit plants growing on land plots of *dekhkan* enterprise;
- develop methods for raising the awareness, level of knowledge and sense of responsibility of members of *dekhkan* enterprise with regard to the necessity of biodiversity conservation; and

- assign responsibility through legislation to farmers' associations or farm enterprises to maintain registers of fruit crops growing on their farm lands.

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TURKMENISTAN LEGISLATION ON SUPPORT TO FARMERS IN CONSERVATION OF LOCAL VARIETIES OF FRUIT CROPS

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Introduction

The local varieties of fruit crops and their wild relatives constitute the basis for the development of fruit production and viticulture in Turkmenistan. Farmers (*daykhans*) are directly engaged in agricultural biodiversity conservation using traditional knowledge and skills.

Many traditional local varieties are still being grown in the orchards and homegardens (*in situ/on farm*). Wild relatives of fruit crops, as in the past, can be found in their natural habitat, although at present this unique genetic diversity is endangered due to unsupervised human activities such as the collection of wild fruits, removal of trees and overgrazing. A considerable part of the diversity of wild fruit and nut-bearing species is protected in the territory of mountain reserves (456, 980 ha). In Makhtumkuli Scientific and Production Center of Genetic Resources (MSPCGR) of the Institute of Botany of the Academy of Sciences of Turkmenistan, 4,040 accessions of agricultural crops are conserved, including 450 accessions of plants of Turkmen origin and 1,000 accessions of Central Asian origin. The native core of the genetic resources collection of the Center consists of accessions of eight fruit crops (pomegranate, apple, pear, plum, fig, pistachio and almond) and grapevine, of which 186 are accessions of local varieties and 223 accessions of wild forms of Turkmen origin.

Conservation of the diversity of fruit crops and their wild relatives results in the provision of genetic material to all groups of users, including breeders, farmers, foresters, nursery keepers, scientific organizations and researchers. The importance of agricultural biodiversity conservation to the food security of Turkmenistan is its potential for meeting the future needs of breeders and other users of germplasm with the material they require to carry out their work. Local farmers' participation, in particular the application of their traditional knowledge and practices on the cultivation, processing and storage of products from local varieties of fruit crops, along with the application of scientifically-developed technologies, contribute to the establishment of a firm base for increasing agricultural production. Local varieties of fruit crops and

grapevine and their wild relatives comprise the basis for agricultural production in the center of origin and diversity of these crops, of which Turkmenistan is a part.

The country's current legal regime regulates the activity of *daykhan* (farming) enterprises (hereinafter *daykhan* enterprises) in the practice of the conservation and use of plant genetic resources to produce food and develop agriculture. At present there are 497 *daykhan* enterprise associations where 395,700 tenants and private persons use about 83% (1,460,000 ha) of irrigated land in Turkmenistan. Statistical data on the number of *daykhan* enterprises engaged in fruit crop cultivation as well as the volume of fruits and grapes produced is absent. Fruits and grapes in the local markets are mainly supplied from the homegardens of farmers and the importation from outside the country, rarely from *daykhan* enterprise associations.

In Turkmenistan issues on farm development have been regulated by a number of legislative acts promulgated in Turkmenistan since 1992 and which were based on the establishment and functioning of exchange relations in the village. This has led to the reformation of organizational and legal forms of management in the agrarian sector.

Reforms in the agrarian sector

The reorganization of *kolkhoz* and *sovkhos* and interfarm enterprises into peasant and then *daykhan* (farm) associations offered the possibility for development of productive cooperation without monopolies on land use. Independent *daykhan* (farming) enterprises and the first agricultural services, the activity of which aimed at the elimination of the estrangement of farmers from land, were established. New organizational and legal forms took on the role of providing temporary links to ensure a smooth transition to the new relations between the components of agricultural production system. The implementation of land and water reforms and land allocation to private ownership and long-term lease had improved the conditions of functioning private farms, helped to increase food production, including fresh vegetables and fruits to the local market.

At the result of this, the legislative system was formed to provide protection of farmers' interests in the market-driven economy. Regulations of the *Constitution of Turkmenistan* (1992, with amendments in 2008) and the Presidential Decree *On the Right of Ownership and Land Use in Turkmenistan* (1993) were used as a basis for this system. The laws: *On the Denationalization and Privatization of Property in Turkmenistan* (1997), *Law on Ownership* (1993, amended in 1997) and *On Lease and Leasing Relations* (1997) were aimed at reforming agriculture. The new laws on *Allocation of Land in Ownership to Citizens for Farm-Market Agriculture* (1996); *On State Support for Small and Medium-Sized Enterprises* (2009), *On Credit Associations* (2011) defined the framework of guarantee of the protection of farmers' (*daykhans*) rights, their interests and farms.

Supervision in the sphere of seed-production in Turkmenistan was implemented on the basis of the new *Law On Seed Production* (2010). The legal and organizational framework of breeders' efforts was considered in the new *Law On Legal Protection of New Varieties of Plants* (2011). This law allows the provision of legal protection of breeding achievements through the issue of breeder's rights for newly created plant varieties if the new variety corresponds to such criteria as novelty, distinctiveness, homogeneity and stability.

Legal framework for *daykhan* (farming) enterprises development

The main legal documents on farm development are the laws *On Daykhan (Farming) Enterprises Associations* (2007) and *On Daykhan Enterprises* (2007) as well as the law *On State Support of Small and Medium-sized Enterprises* (2009), which are tightly connected with the main regulations of *Land* (2004) and *Water* (2004) Codes of Turkmenistan.

In accordance with the *Law On Daykhan (Farm) Enterprises* (2007)“ the *daykhan* (farming) enterprise is a family-based association involving labour of persons conducting agricultural production mainly based on the personal labour of family members” and without employing people under labour contracts (Article 4). The *daykhan* enterprise as a legal entity created for agriculture production and based on compound property is provided with the right to protection of its members and the right to participate in activities in maintenance of local varieties of fruit crops and their wild relatives for food, medicinal, traditional and cultural purposes.

The *daykhan* enterprise is established based on the presence of an agricultural land plot; in accordance with the *Land Code*, land is allocated following a citizen's request based on the location of the land. The land plots of *daykhans* are allocated away from restricted land reserves and designated as property for agricultural production (*establishment of orchards, gardens, homegardens or farm enterprises*) and construction of individual houses and outbuildings. The main condition is a preliminary (within two years) ownership and use of land under a lease. For a long-term lease to families of independent *daykhan* enterprises, agricultural joint-stock associations and tenants' associations, the extent of land can reach up to 200 hectares. In accordance with the Presidential Decree *On the Establishment of Agricultural Joint-Stock Companies in Turkmenistan* (2004),” a single agricultural public joint-stock company, mainly for the cultivation of wheat, cotton and other agricultural crops with the use of hired labour, can be established.

The allocation of land for private subsidiary small-holding and individual house construction is carried out in accordance with the decision of the *khyakimlik* of the town (the main management body of a town). The *daykhan* enterprise begins its activity on the basis of self-financing and self-sufficiency as well as the observance of

current standards on product quality, sanitary and other norms. *Daykhan* enterprises can be united voluntarily into cooperatives, societies, unions and other types of organizations and participate in the activity of cooperatives, joint-stock associations and other enterprises and receive income from them.

After receiving a land plot for lease, the *daykhan* enterprise, in accordance with the *Law On Daykhan (Farming) Enterprises' Associations* (2007), becomes the part of the *daykhan* enterprise association, the objectives of which are the development and strengthening own production and development bases, by supporting and applying to agricultural production the achievements of scientific and technical progress, advanced practices and new technologies. The Law introduces the establishment of social services in the village through enterprise development, through a network of workshops on the processing of local raw material and production wastes, greenhouse construction and the creation of associations to service local communities. The *daykhan* enterprises' associations can independently choose its own objectives and plan its activities in accordance with the obligations undertaken in agreements on the production and purchase of the main agricultural products, taking into account the perspectives of private development (Article 8, Clause 1). Members of *daykhan* (farming) enterprises' associations can voluntarily unite with the groups of tenants, whose lands are located contiguously.

A *daykhan* enterprises' association has the right to establish special target funds for production and social development and, to reserve funds from its own income in order to provide financially for expanded production. Credit unions – from a credit establishment not belonging to a bank – correspond more fully to this purpose. These credit establishments were created in accordance with the national *Law On Credit Unions* (2011) for the development of financing services and entrepreneurship for support of economic independence (including farmers).

Issues of land property rights are reflected in the *Civil Code* of Turkmenistan, *Land Code* (2004) and *Law On State Support for Small and Medium-Sized Enterprises* (2009), in which the protection of farmers' rights to land and properties of farm members was established. In accordance with the state programme on support of businesses, a widely-applied practice is to credit entrepreneurs for 10 years with 5 percent annual payments on the purchase of equipment, and to issue credit for one year for working asset acquisition. The farmer, as one of the components of agriculture, can be owner, renter and user of the land.

“Establishment of conditions for equal legal development of all forms of economic activity on land” by an owner and user of land is envisaged in the *Land Code* (2004). Allocation of land to farmers in accordance with legal norms is the basic element in the protection of rights and interests of owners and users of land (*daykhans*). The details of this land allocation are absent in the new land law and its function and the relevant authorities are not defined. Owners of land have the right to manage the farm independently and the ownership right for the planted crops, for agricultural

production and for income derived from its realization. The land law states that interference in the activity of owners, users and tenants of land by state, economic and other bodies and organizations as well as by government officials is prohibited except in cases of violation of Turkmenistan's land legislation. Organizational and legal forms of enterprise such as tenant associations (farmers' association) engaged in agricultural production were reflected for the first time in the law. The *Land Code* establishes that users of land growing wheat and cotton are supported with water by the State, which, unfortunately, is not the same for fruit crop cultivation.

Water supply for agriculture is implemented based on agreements between State institutions and water users (*Water Code*, 2004). Thus many farmers, due to the deficit of water resources, grow fruit crops and grapes mainly in their home gardens and orchards, the average area of which does not exceed 0.2 ha. Only single *daykhan* (farming) enterprises can devote a large area to fruit crops, for instance, pomegranate orchards in the Sumbar valley of Makhtumkuli *etrap* (district), or pistachio plantations in rainfed forest lands of Badkhiz. In addition, present regulations favor the farmer dedicated to raising cattle and poultry by exempting him/her from paying taxes, and subsequently the farmers gets more income from keeping the livestock in subsidiary small-holdings than from developing fruit orchards. Therefore, on the one hand, fruit crops are not essential food products and, on the other hand, the present situation does not provide incentives for their commercial production. As a result they have been restricted to be the less market-competitive products. However, despite these circumstances, the priority of the local legislation should be the conservation of local genetic resources of fruit crops as they have great potential for economic benefit.

In the *Land Code*, the guarantor for the protection of rights of owners, users and renters of land (farmers) is the State, which oversees the utilization and protection of land, the observance of land legislation, the prevention of violation of national laws in the sphere of use and protection of land, the exposure of such violations and implementation of appropriate measures for their elimination (Article 104). Important as a guarantee for the protection of *daykhans'* rights is the presence of norms concerning the resolution of conflicts in the case of violation of land users' rights and issues regarding the responsibility for violation of land legislation. Legal protection of the rights of members of *daykhan* enterprises' associations is provided through the *daykhan* enterprises' associations themselves or through special organizational structures (general meetings, meetings of *daykhan* (farming) enterprise). However, the issue of the protection of the rights of farmers' engaged in management of fruit crops and their wild relatives is absent in this legislation.

State support to farmers

Through the implementation of a programme of restructuring of farms, the State and state bodies supported the development of *daykhan* (farming) enterprises. However, the establishment and development of leasing relations has not preceded by a direct

evaluation of the local knowledge and practices of farmers nor of their ability to innovate. Concrete legal norms for the protection of farmers' rights in the cultivation of local varieties of fruit crops and their wild relatives are absent, although in the legal documents any limits concerning fruit crop cultivation on the *daykhan* (farming) enterprises were likewise not defined. On their farms, farmers have the legal right to cultivate local varieties and wild relatives of fruit crops using their knowledge and traditional practices. They can fully implement activities on the cultivation, processing and conservation of fruits and fruit products and have the right to derive income from the use of these products at their own discretion and without being subject to the payment of tax.

In accordance with the *Water Code* (2004), farmer associations can utilize bodies of water resources at their own expense, providing farm with irrigation, water collection/drainage networks and hydro-technical equipment as well as allocating the quotas of water use for irrigation and other productive, and public utility purposes. Farmers -water users should rationally use water resources.

Agricultural joint-stock societies have the right to specific privileges only and exclusively for wheat and cotton production. Unfortunately, these privileges, in the form of subsidies and exemptions, do not exist for the development of fruit cultivation and viticulture. Under joint-stock societies all members of the agricultural society may be exempted from obligatory transfer of funds from their income in foreign currency to the Interbank Foreign Currency Exchange of Turkmenistan and the Foreign Currency Insurance Fund of Turkmenistan. This also implies different support measures on the provision of services and subsidies for the acquisition of agricultural inputs.

Members of a joint-stock society are the Ministry of Water Resources, the Ministry of Textile Industry, the Ministry of Trade and Consumer Cooperation, the association "Turkmenobakhizmat," a 50 % share of which belongs to the Government and agricultural producers. This association provides services related to the use of machinery in the cultivation of agricultural crops and harvesting. The association "Turkmengallaonumleri," which is responsible for the development of the cultivation of grain crops and subsidizing from the government budget 50% of the expenses incurred by agricultural producers related to purchase of seeds, water, mineral fertilizers, pesticides and machinery services. The state concern "Turkmenpagta" is engaged in the development of modern methods and forms of management in the cotton cultivation and processing industries. The state concern "Turkmen dokunkhimiya" is responsible for the provision of mineral fertilizers with 50% reduction of prices. The commercial bank "Daykhan Bank" provides agricultural producers with credit at low interest rates. Fruit cultivation and viticulture have not been included in the circle of interests of this joint-stock society.

Taxation of *daykhan* enterprises is in accordance with the *Tax Code* and the amendments *On Inclusion of Modifications and Amendments to the Tax Code of Turkmenistan* of 4 October 2010. *Daykhan* enterprises use the services of ministries

and institutions on mechanization of agricultural activities, delivery of fertilizers and water resources and other necessary inputs on a payment basis. *Daykhan* enterprises' associations are responsible for violations of contractual, credit, calculation, tax and other obligations regarding owned property, for damage due to the irrational use of land and other natural resources, for pollution of environment and for violation of other rules of the *daykhan* enterprises' association.

Thus *daykhan* enterprises and their property are protected by the state in accordance with the legislation of Turkmenistan. Wholesale trade with far-flung networks of the local establishments of "*Daykhanbank*", enterprises for productive and technical services is being developed based on the formation of market infrastructure in a village. Further perfection of contractual relations between economic actors based on private entrepreneurship will lead to the development of business initiative and more active mastering of exchange relations by farmers. The *Law On Allocation of Land in Ownership to Citizens for Farm-Market Agriculture* (1996) becomes a starting point for encouraging the development of farms and the formation of a normative and legal base for their functioning. However, in all legal documents no attention was paid to the weak level of the population's awareness of the importance of support to farms engaged in the cultivation of local varieties of fruit crops and their wild relatives. Protection of farmers' traditional knowledge and benefit sharing from the use of plant genetic resources in Turkmenistan, is unfortunately not reflected in any current national legal document. However, the right to credit for acquisition of main inputs is provided to farms as entrepreneur structures under the new *Law On State Support for Small and Medium-Sized Enterprises* (2009).

Conclusions

Analysis of the normative and legal acts in force in Turkmenistan on the development of *daykhan* enterprises allows not only the recognition of the inadequacy of national legislation with regard to the development needs but also gives attention to the necessity of supporting farms engaged in cultivation of local varieties of fruit crops and their wild relatives. In Turkmenistan the current legal limits consider the protection of farmers only through a complex of measures directed to the increase of farm independence. The state concentrated its market reforms mainly in the area of improvement of financial and credit systems, strengthening of the material and technical base, improvement of the service of technical and economic service, among others. However, these reforms do not deal with legal support of farmer efforts on development of his/her farm and support of farmers' activities in the conservation of local genetic resources of fruit crops and especially investment by the country in the establishment of new orchards and nurseries. Economic means of encouraging farmers' activities in the conservation and sustainable use of local agricultural biodiversity are also absent. As the result, the current legal limits do not present the farmer with the possibility of participating independently in the process of decision-making in the area of conservation of the diversity of local varieties of fruit crops and

their wild relatives on farm and *in situ*. Relying on current national legislation, it is not possible to fully provide for the protection of farmers' rights to plant genetic resources or to share the benefits from their use in other countries.

Recommendations

Recognizing the large contribution of farmers and local communities to the development of plant genetic resources, it will be important for the country to provide further improvement of national legislation on legal support of farmers and their farms and to provide for increasing the level of knowledge and awareness on the part of farmers of this legislation. For this reason, initiatives on support of farms were developed within the framework of the regional UNEP-GEF project "*In situ*/on farm conservation and use of agricultural biodiversity (horticultural crops and wild fruit species) in Central Asia" coordinated by Bioversity International.

The draft law *On Protection of Farmers' Rights, Measures to Support Farms and Mechanisms for Benefit Sharing in the Cultivation of Fruit Crops and Their Wild Relatives in Turkmenistan* was developed within the framework of the regional project as a public initiative directed to the solution of problems in the areas of farmers' rights, support of farms and strengthening intellectual property regimes dealing with the traditional knowledge of farmers. The draft law (three chapters, 15 articles) regulates the activity of *daykhan* (farming) enterprises' associations of Turkmenistan, where the priorities are the economic encouragement of farmers, development of markets for local fruit crop products, material and technical support of local farmers engaged in the cultivation of local varieties and wild species of fruit crops and grapes (*in situ*/on farm).

The establishment of a targeted and well-composed normative legal framework on support to farmers and development of organizational and legal forms for agricultural production systems is an important step in the conservation of agricultural biodiversity, local varieties of fruit crops and their wild relatives registered at the national level. It is thus necessary to support farmers and to ensure further development as follows:

1. Provide legal support to farmers engaged in the cultivation of traditional varieties of fruit crops, grapevine and their wild relatives, the activities of which should be aimed at:
 - sustainable management of land resources;
 - crop diversification based on the social, cultural and economic needs that affect support to the genetic diversity of agricultural crops;
 - participation in decision making on issues related to the conservation and sustainable use of plant genetic resources for food and agriculture;
 - the conservation, use, exchange and realization of conserved seeds/planting material for multiplication on farms;
 - establishment of farmers' associations;
 - protection of traditional knowledge of farmers and local communities;
 - protection of nature and forests;

- use of crop genetic resources and their wild relatives;
 - establishment of market niches for local products;
 - encouragement from the government's side;
 - institution of privileged taxation and subsidies; and
 - allocation of additional financing from state or public funds to the support of farmers engaged in cultivation of local low yielding and underutilized varieties for market but capable of conserving their genetic diversity.
2. It is necessary to add to the law *On Legal Protection of New Varieties of Plants* (2011) a clause regarding the inclusion of seeds of local varieties (clones) of fruit crops to the state register of protected breeding achievements.
 3. Organize annual Diversity Fairs for agricultural products.
 4. Develop and implement a strategy for increasing consumer needs for local products of fruit crops, including improved processing, packaging and niche creation for traditional varieties.

Provide for an increase in the level of public awareness about the significance of agricultural biodiversity and of producing organic products without the use of chemicals.

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REPUBLIC OF UZBEKISTAN LEGISLATION ON SUPPORT TO FARMERS

Narynov Uryn and Baymetov Karim

Introduction

Fruit crops have been part of human diet since ancient times in Uzbekistan and in the present horticultural crops have the same important significance as a source of nutrition. The local populations are still growing many valuable ancient varieties of fruit crops on farms. Mountain forests are home to their wild relatives, representing an inexhaustible source for the selection of new forms and varieties with a complex of useful features and properties.

In recent years, a variety of fruit species has been subjected to genetic erosion, manifesting itself as the disappearance of many valuable varieties and even species. The disappearance of local varieties is the result of insufficient public understanding of the importance and value of plant genetic diversity. No methods for supporting farmers in the conservation *in situ*/on farm of this diversity have been developed. The role of farmers is central to this issue, while their involvement is the determinant factor in achieving effective *in situ*/on farm conservation.

Uzbekistan is currently distributing genetic resources of fruit crops through the exchange of planting material among farmers (human factor), constituting more than 30% of the total supply of planting material, while the spontaneous spread of plant genetic resources (biotic factor) amounts to 20-30%. Nursery farming is highly developed in Uzbekistan. Almost all fruit farms and forestry institutions in the country run their own nurseries and thus farmers are self-reliant to a great extent in terms of planting material supply. The UNEP-GEF project “*In situ*/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild fruit Species) in Central Asia” has identified more than 100 nurseries involved in growing seedlings of fruit crops and grapes within farms and forestry enterprises of the Republic.

National policy and legislation on farm development

A number of normative-legal acts regulating agricultural attitudes functions in Uzbekistan Republic. They include: Laws of the Republic of Uzbekistan *On Agricultural Cooperatives* (No. 600 of April 30,1998), *On Farms* (No. 692 of 30 April,1998), *On Private Farms* (No. 604 of 30 April 1998), *On Micro- financing* (No. 63 RU-50 of 15 September, 2006) and *On Seed Production* (No. 267 as of 29 August,1996), Decrees

of the President of Uzbekistan *On The Major Directions on Strengthening Reforms in Agriculture* dated 24 March 2003, *On Additional Measures for Maintenance of Execution of Laws Directed to Agriculture Reform* dated 11 March 2004, *On Measures For Strengthening Of Economic Reforms in Fruit and Vegetable Growing and Viticulture* of 9 January 2006 .

The process of reforms in Uzbekistan has taken place gradually and mainly the following three different periods can be distinguished in agrarian reforms:

Phase 1 – 1991-1998

A land area of 200,000 ha was provided for *dekhkan* (farming) enterprises (hereinafter *dekhkan* farms) under the order No -UP 295 of 29 November 1991 of the President of Uzbekistan *On the Development of Dekhkan Farming in the Republic* and Cabinet of Ministers' order No. 315 of 30 December, 1991 *On Measures for the Further Development and Consolidation of Dekhkan Farming*.

One hundred hectares of land was provided for farming organizations according to decision No. 88 of Cabinet of Ministries *On Additional Measures for Economical Reform Realization in Agriculture* dated 23 February 1994. The number of farms was increased 9.8 times and land area devoted to farming was increased from 200,000 hectares to 446,000 hectares. The average area of one farm was 19.4, ha. The number of workers there ranges from 14,000 to 138,000 people, and the share of agricultural production was from 0.5 to 3.5 %.

Phase 2 – 1998-2001

The *Land Code*, laws *On Cooperatives*, *On Farming Enterprise* and *On Dekhkan (Farming) Enterprise* were completed on 30 May 1999 in order to develop *dekhkan* and farming enterprises in the Republic. In the years since, some *shirkats* (agricultural co-operatives) became unprofitable.

On the basis of the decision of the Cabinet of Ministers No. 243 dated 13 June 1999 *On A Program of Strengthening Market Development in Khorezm Province for 1999-2001* farms were created in this region on the basis of eight *shirkats*. Such an experiment has been carried in Sirdarya Province and in the Karakalpakistan Republic. These experiments gave positive results. The wheat harvest increased by 15-20% in newly organized farms and the expenditures on wheat and cotton cultivation on single hectares decreased by 5-8%. The number of farms increased 2.4 times and land area increased from 446,500 to 1.054,700 hectares. The number of workers increased from 138,200 to 388,000 people, and the share of agricultural production has increased from 3.5 to 6.9%.

Phase 3 – 2001-2007

The number of farms created on the basis of unprofitable *shirkats* increased. By order No. UP-3226 dated 24 March 2003 of the President of the Republic of Uzbekistan *On Strengthening of Economic Reforms in Agriculture* establishment of individual farming enterprises were defined as a priority objective in agricultural production. The order No. UP-3342 dated 27 October 2003 by the President of the Republic of Uzbekistan *On Concept of Farm Development for 2004-2006* was accepted. The newly proposed law *On Farms* was accepted in 2004 and gives privileges to farms that are newly organized on the basis of *shirkats*.

Analyses show that cooperatives - large agricultural enterprises or *shirkats* — have the following advantages:

- they are based on shared origins and mainly family (collective) contracts, and are voluntary associations of citizens for the production of agricultural commodities;
- membership in cooperatives is voluntary and cooperative outputs are unobstructed (without barriers); and
- they independently define the activities, structures and volumes of production.

However, the disadvantages are that the members of a cooperative do not feel the responsibility of ownership and do not consider themselves as owners since they have the right to leave free membership. They thus work without motivation. Practice has shown an inefficiency in work in cooperatives, so that there has been a reorganization of the overwhelming majority of cooperatives into farms.

In contrast, a *dekhkan* enterprise is an independent economic entity based on joint activities of members of the farm. It has the following advantages:

- entitlement to a credit in the mortgage of land;
- the size of the land area and its border can be changed only with the consent of the head of a farm;
- within two years from the moment of the state registration it is released from payment for using the land area;
- it is released from payment of the unified land tax regarding the lands developed at the farm's expense for the period stipulated by the corresponding project and within five years from the moment of reclamation; and
- the farm has the right to organize its industrial activity on the given land area in conformity with the specialization stipulated by the charter and the rental contract.

At the same time there are difficulties at fulfilling of the following clauses of the law:

- the farmer necessarily should have corresponding qualification or an operational experience in agriculture;
- by granting the land areas, the farm incurs the obligation to provide productivity of agricultural crops (in mid-annual calculation for three years) not below a cadastral estimation of the land; and
- the farm provides delivery of agricultural production for state needs according to the concluded contracts within the limits of the stipulated volumes.

Measures to reform agriculture had a positive impact on the conservation and use of fruit crops. Farmers obtaining appropriate qualifications, knowledge and experience, cultivate in their orchards different varieties of fruit crops, including local ones, which ensures their conservation. In this case, the farmers were not entrusted to cultivate crops other than local fruit crops.

The disposal of income after payment of taxes by the farm, as well as levies and other obligatory payments falls to the head of the farm alone.

By the decision of the government of Republic of Uzbekistan, the creation of farms is recognized as having a high priority in development of agriculture of the country.

In recent years, due to the complexities in selling fruit and grape production, in a number of districts the request to use the land for other purposes was granted. After adoption by the President of Republic of Uzbekistan of Decree *On Measures On For Strengthening Economic Reforms In Fruit And Vegetable Growing And In Vineyards*, positive process in this direction again is being observed. For example, in Bahmal District of the Dzhizak Province alone, more than 260 farmers were engaged in horticulture and 90 in grape growing. In total there are 2,790 ha of orchards and 544 ha of vineyards in the region. Under the decision of the President of the Republic dated 9 January 2006 with regard to specialized fruit and vegetable cultivation and vineyards, more than 39,000 individual farms have been created from 219 agricultural cooperatives. More than 319,000 ha of land have been allocated to these farms. In addition, 199 agricultural firms for the processing of fruit and vegetable production and grapes, particularly with the provision of transport services, packing and packaging were created.

A household is a small scale enterprise carrying out the production and sale of agricultural products on the basis of personal labour of family members on their land plot, given to the heads of families for perpetual inheritable hold. More than 80% of the basic producers of vegetables and fruits in the Republic are *dekhkan* households.

On the basis of the analysis of legislative and normative/legal acts, it is necessary to note that based on the background of reforms in agriculture, gradually, stage by stage, the reforms in horticulture and viticulture are being carried out. By successive governmental decisions, the creation of farms is recognized as a high national priority in the development of agriculture. This has encouraged farmers to take independent decisions, to develop horticultural farming using local varieties and to increase their diversity. These developments also have improved the conservation of wild relatives and resulted in a larger-scale reproduction of local varieties of fruit crops.

Agrarian reforms in the country are aimed at the formation of market-oriented farms and the establishment of principal new market agricultural infrastructures that provide farms with a wide spectrum of necessary industrial, banking, insurance, consulting,

trading and other services, and also the effective transfer of production outputs from field to end-consumer and from farmer to processor and manufacturer.

Analysis of the legislation of the Republic of Uzbekistan connected with the establishment of farms, activities of farmers, and also protection of farmers' rights has shown a positive result in the regulation of attitudes connected with horticultural farms. In addition, the decree of the President of the Republic dated 9 January 2006 created all the conditions for the cultivation of fruit crops and the development of farms in horticulture and viticulture. Nevertheless, the analysis of the efficiency and the observance of legislative/normative acts shows that there are still defects in the mechanisms for the application of laws and normative acts.

In recent years, farming has been extensively developed in the country. A number of laws regulating the creation of *dekhkan* farms and farming enterprises have been adopted. In addition, laws to protect their interests, including their intellectual property rights for crop varieties that they have bred, have been passed. The *Law On Breeding Achievements* was approved on 29 August 2002 as No. 395 and is aimed at regulating relations in the process of creation, legal protection and use of breeding achievements. A new plant variety is considered a breeding achievement in plant breeding. The law defines a variety as follows: a variety is a group of plants ascertained by properties that are persistently inherited, which characterize the given genotype or a combination of genotypes and different from other groups of plants of the same botanical taxon by one or more properties. Protected items of a variety include a clone, a line, a hybrid of the first generation, and a population.

The State Commission for Variety Testing of Crops within the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan examines the patentability of the claimed breeding achievements. An individual who created (bred or identified) a new plant variety is recognized as an author of a breeding achievement and issued a patent for a breeding achievement. Thus, the *Law On Breeding Achievements* does not differentiate between different categories of individuals. This can be any farmer who has created a new plant variety.

The analysis of legislative/regulatory documents on protection of farmers' rights to intellectual property for bred fruit crop varieties concludes that for research activities that are carried out jointly with farmers, especially with the view of creating new fruit crop varieties, it is recommended that an agreement is generated and signed before the commencement of any work that reflects interactions between the farmer and a research organization. It should be stipulated, however, who will be a patent holder and how remunerations will be allocated.

The *Law of the Republic of Uzbekistan On Breeding Achievements* is closely linked to the *Law On Seed Production* adopted on 29 August 1996. Fruit crops and grapes reproduce through vegetative propagation and better fall under a concept of seeds that is worded as follows in Article 1: "Seeds are a botanical seed or any other part of

a plant crop used for conservation, reproduction of varieties and hybrid”. In this case, seedlings of fruit crops are equal to seeds. According to the Law, patent holders are entitled to produce and use seeds protected by patents. It follows from this that in case a farmer breeds a new variety and receives a patent, he/she shall have a right to set up his/her own fruit nursery and grow fruit seedlings for sale.

In this case, the Law provides for the obligations of persons involved in seed production to:

- develop and introduce an effective system of primary seed production and a technology of seed production;
- provide author’s description of hybrids and varieties;
- produce seeds with high cultivar and sowing qualities on the basis of agreements with consumers of seeds; and
- generate and publish seed catalogues periodically.

This means that a farmer is to introduce an effective system of growing seedlings at his/her nursery, provide a description of propagated varieties and produce high quality goods – fruit crop seedlings.

Seedlings grown in nurseries shall be subject to certification in the manner prescribed by law. Moreover, seeds may be sold if there is a certificate of conformity with their varietal and seed qualities and the farmer must guarantee conformity with varietal and sowing qualities of seedlings specified in the relevant documents and bear responsibility in the manner prescribed by the laws. Thus, the analysis of the laws *On Breeding Achievements* and *On Seed Production* shows that the laws fully support and protect the intellectual property rights of farmers.

Uzbekistan has established the institutional framework of legal protection of breeding achievements. There is a Patent Office and the State Commission for Variety Testing of Crops within the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan. Any farmer who has created a variety can become the author of a breeding achievement. He/she can be co-author if a breeding achievement involved several persons.

Barriers for local diversity of fruit crops conservation on farm

Among the main problems faced by farmers in agricultural biodiversity conservation on farm, the following ones can be underlined:

1. poor development of irrigation-drainage systems, shortage of irrigation water, limited access to resources;
2. the majority of farmers lack enough knowledge of the importance of conservation of local varieties of fruit crops and their agricultural cultivation/processing as

well as knowledge of the application of fertilizers, methods of pruning, pest and disease management, among others;

3. farmers' own financial resources are poor; payment of delivered production is implemented with great delay. Access to borrowing resources is limited, due first of all to lack of monetary resources at banks. Access to bank credit by poor farmers is limited by the absence of necessary mortgageable property, and also the high cost of insurance, information, advisory and legal services accompanying the credit procedures. Farmers would like to receive credit for purchase of agricultural machinery and equipment for the processing of fruits and vegetables. A significant part of land owners would like to use credit resources for reconstruction and cleaning of irrigation/drainage systems, carrying out washing by water and purchases of water pumps;
4. all farmers, especially poor ones, encounter the problem of absence of necessary agricultural machinery, albeit on different scales. Purchase or leasing of technology is inaccessible to them. For payment of rent of technology from private persons, they lack adequate cash. A unique way for them to rent technology is by cashless settlement from the station of agricultural machines and tractors which establishes high monopoly prices and thus quite often results in the breaking of contractual responsibilities. Similar problems occur with poor farmers when they seek to obtain other resources such as POL (petroleum, lubricants, oils) and fertilizers. Shortage of financial resources, especially cash means, forces them to acquire the services of centralized suppliers (monopolists) and to pay high prices for services;
5. cultivation of planting materials of fruit crops is conducted randomly — farmers and local residents lack methodological manuals and manuals on the cultivation of planting material of local varieties, choice of assortment of fruit crops and also technology for the establishment of gardens by zones, etc.; and
6. present associations should coordinate the activity of farmers, develop recommendations on the perfection of use of farmland and the rational use of limited water resources, make decisions on social-economic tasks, organize the improvement of professional skills of farmers and also render advisory services on tax and bank questions. In some places authorities do not give due attention to divisions within associations of farmers. They cannot operatively influence the resolution of problems arising in the farm activities. They do not hold responsibility for agreements between farms and divisions of associations on deduction of membership fees.

The main tasks of created agro-businesses include the organization of storage, processing and export of fruit and vegetable production and grapevines, and also the supply of transport services and services for packing. However, the monitoring of the activities of these agro-businesses shows that they cannot fully realize the functions assigned to them, and on a higher level are engaged in administrative tasks.

Following an analysis of the development of horticulture in the country, it should be noted that in the past local populations released numerous unique varieties of fruit crops through breeding. They were characterized by unsurpassed taste and

commodity qualities. However, in recent decades these fruit crops released through farmer breeding have ceased to be used. The main reasons for this state of affairs are:

- all varieties released by national breeding have not been provided protection by the government;
- all land areas in the possession of the local population have been taken away. In this connection, the great majority of the population have had no opportunity to be engaged in the breeding of plants;
- local breeders have been ignored;
- national methods of breeding have not been scientifically developed; and
- even popular scientific books devoted to breeders and national breeding programmes have not been created.

As a result of reforms conducted in agriculture, improvements in gardening and viticulture have been realized. By the decree of the President of 9 January 2006 *On Measures for Strengthening of Economic Reforms in Horticulture And Viticulture* created, on the basis of 219 agricultural co-operatives (*shirkats*) specialized in horticulture and viticulture, more than 35,000 farms for the conservation of existing specialization. They were allocated 319,200 hectares of agricultural land. As a result, a positive process in the development of gardening and in the production of fruit was observed. For example, farms produced 478,500 tons of fruits in 2006 and 580,200 tons in 2007, 407,300 tons of grapes in 2006 and 480,000 tons in 2007.

Under the initiative of Senate of the *Oliy Majlis* (Parliament) of the Republic of Uzbekistan, on 2 November 2007 in the Uzbek Research Institute of Fruit Growing, Viticulture and Winemaking named after Acad. R.R. Shreder, a scientific conference was organized. The theme of the conference was «Development of research on the production base of agriculture to guarantee sustainable agricultural production». More than 100 representatives from the Ministry of Agriculture, Farmers Associations, local authorities of Tashkent District, research institutes, and farmers from various provinces of Uzbekistan participated in the conference. At the conference problems of horticulture were examined and it was noted that in recent years, there has been a decreased cultivation of traditional local varieties of horticultural crops and an increased delivery of fruits from abroad. Dekhkans and farmers have taken great interest in the cultivation of modern varieties which are intolerant to local harsh continental conditions, which resulted in 2002 in the destruction of orchards by frost over an area of three thousand hectares and vineyards over an area of 14,000 hectares. The results of the conference underlined the meagerness of orchards in the Republic (25%), the insufficiency of machines and mechanisms, the absence of sufficient maintenance of orchards in farms owing to their low productivity. A proposal was made to organize a foundation of orchards by zone, to place the development of horticulture under strict control of the state, and to apply the Chinese method for development of horticulture, which consists in the allocation of easy credit and of mini-tractors to farmers.

Conclusions

The results of the UNEP-GEF project “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticulture Crops and Wild Fruit Species) in Central Asia*” coordinated by Bioversity International allows to analyze the impact of various factors affecting the status of plant genetic resources, namely, on the state of local varieties of fruit crops in Uzbekistan. In the Republic of Uzbekistan there are a number of legal acts regulating conservation of local varieties of fruit crops. Reforms in the agriculture sector under the Decree of the President of the Republic *On the Most Important Directions of Strengthening Reforms in Agriculture of 24 March 2003, On Additional Measures to Ensure Enforcement of Laws Aimed at Reforming Agriculture of 11 March 2004, and On Measures to Strengthen Economic Reforms in Horticulture and Viticulture of 9 January 2006*, all contributed to an increase in the number of farms and farm households and their territory.

Measures on reforming agriculture have had a positive impact on the conservation and use of fruit crops. Farmers, upon obtaining appropriate qualifications, knowledge and experience, cultivate in their orchards different varieties of fruit crops (including local ones), which contributes to their conservation. Based on an analysis of legislative and regulatory acts, it should be noted that against the background of ongoing reforms in agriculture, reforms in the horticulture and viticulture are gradually being carried out. By the decision of the Government of the Republic of Uzbekistan, the establishment of farm households is considered to have the highest priority in the development of agriculture in the country. This has influenced farmers' adoption, through independent decisions, to develop gardens that use local varieties and to increase their diversity.

An analysis of the legislation of the Republic of Uzbekistan connected with farm activities and protection of farmers' rights demonstrates and underlines its ability to provide legal regulation of relations connected with horticulture farms. In addition, according to the Decree of the President of the Republic dated 9 January 2006, all conditions for the cultivation of fruit crops and the development of farming in horticulture and viticulture have been created in the Republic.

Recommendations

Proposals of farmers

Farmers from the provinces at the round table discussions organized in the project sites of the UNEP-GEF project “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*” coordinated by Bioversity International have proposed the establishment of unobstructed delivery of easy credit from banks for the organization of work on farms and freedom to associations of farms as well. They suggested strengthening of linkages between science and production, the conduct of work on the restoration of old local varieties of

fruit crops, an increased level of knowledge of farmer-gardeners through organization of training courses and the distribution of recommendations and manuals. Participants offered to develop mechanisms for supporting farmers. According to the results of these discussions, recommendations aimed at improvement of state of horticulture were developed and submitted to all ministries, departments and regional authorities. The main disadvantages in existing mechanisms of financing are:

- untimely payment for realized production leads to formation of delayed payment to creditors;
- transfer to newly-formed farms of part of the uncovered debts of reorganized *shirkats*; and
- undeveloped and inefficient market infrastructure.

Although financial stability of the farming enterprises is the key factor in the ability of farmers to accumulate steady financial funds and consequently the ability to pay for provided services, stable development of market infrastructure and its effective functioning essentially influences the maintenance of financial stability of farms. Elimination of the above-indicated negative factors would be an important condition for financial stability of farms and the establishment of sufficient solvent demand on the part of farmers to allow them to cover the costs of market infrastructure. At the initial stage of the formation of new farms, because of the limited financial means of farmers, the lack of available material and financial resources, an effective system of state support and stimulation for the creation of infrastructure for farms is required.

Improving farmers' activities on conservation of local varieties of fruit crops and wild fruit species

For the maintenance of effective functioning of fruit-growing farms, protection of farmers' rights offers:

1. united efforts of interested parties (stakeholders), including local authorities of self-management, district and provincial authorities, associations of farmers, scientific institutes and other organizations, on the conservation of local varieties of horticultural crops in the Republic; organization of regular round tables, training events, illustration in mass media of the importance of local varieties of horticultural crops, participation in fairs and increase of farmers' awareness about importance of the conservation of local varieties in farms;
2. in accordance with bank legislation, special attention to the simplification of the procedures of registration of credit, the realization of legislative norms on mortgages of rent rights of land plots and also expected yield;
3. improvement of service of mini banks to farmers and more simplified procedures for delivery of credit; and
4. organization of a purchasing system for fruit and vegetable production and the development of their export.

Proposals for strengthening legislative and policy framework

An analysis of existing national legislation on agriculture and development of farms has been carried out. The analysis of the laws *On Farms* and *On Peasant Farms* established that in their articles are aimed at the common development of agriculture and the increase of agricultural production. There is no exact determination of the level of maintenance of local varieties of horticultural crops. In this connection, modifications and additions to the Laws *On Farms* and *On Dekhkan Farms* are being proposed.

A draft law *On Farm* has been proposed and includes the following contents:

Article 3. Farm :

The proposed modification to the decision of the Cabinet Ministry of the Republic of Uzbekistan No. 486 *On Measures For Further Development Of Lease Relations In Agriculture* of 5 November 2003 is to add before the word “long-term” and then in the text to state: A farm is the independent managing unit for agricultural commodity production on the land areas given in *long-term lease*.

Article 14. Payment for use of land area:

With the purpose of increasing the incentive of the land owner to conserve old/local varieties, the following change is proposed in Article 14:

- Add to Paragraph 4 the following contents: The farm specialized in the cultivation of old/local varieties of fruit crops and grapevine will be released from payment of the uniform land tax within 10 years after registration of these varieties by corresponding organizations.

Article 17. Farm responsibilities:

- After Paragraph 7 add the instruction to: “Carry out conservation of old local varieties of fruit crops and grapevines.”

The following modifications and additions to the *Law On Dekhkan Farms* were proposed:

Article 5. Order on creating dekhkan farms:

In connection with transformations to agriculture, the second paragraph of Item 5 is to state:

- An application to request land with specification of its location, its area, its structure as a *dekhkan* farm and target use of the land area must be addressed to the head of the area (*Hokim*). Within three days the *hokim* must send the application to the District Commission to consider the request.

Article 8. Terms for describing the land:

- The fourth paragraph of Article 8 should be changed to state:
Based on the decision of District Commission on land plot allocation or on the decision of the top management of agricultural enterprises or organization, the *khokim* (mayor) of the district decides on the creation of the *dekhkan* farm simultaneously with the decision on allocation of land plots to the *dekhkan* farm.

Article 10. Payment for using farmland plots:

- It is proposed to add to the second paragraph the following:
Dekhkan farms engaged in the cultivation of old local varieties of horticultural crops and grapevine will be released from payment of land tax within 10 years after registration of these varieties by corresponding organizations.

Article 12. Rights and duties of dekhkan farms:

- Maintain and increase the area planted with old local varieties of fruit crops and grapevine.

Article 23. Taxation of dekhkan farm:

- *Dekhkan* farm engaging in the cultivation of old local varieties of horticultural crops and grapevines will be released from payment of land tax within 10 years after registration of these varieties with corresponding organizations.

Article 25. State and other support for dekhkan farms, and coordination of their activity:

- In the paragraph 7, after the words “Services related to provision of quality seed and planting materials...”, following text should be added: “... including, old local varieties of fruit crops and grapes” and so on.

Farmers and scientists joint research

Research conducted under the project showed that the process of forming and updating a local assortment of fruit crops and grapes is still underway. Farmers are mainly involved in analytical breeding. New forms are ascertained or selected by farmers as authors.

The project activities included participation of farmers in joint research. In this regard, the most promising is their cooperation with scientists in breeding programs. In this case, a farmer is to be mentioned in the application for a patent, in the patent itself and in all publications related to a breeding achievement. The farmer has the right to obtain a patent for a breeding achievement. In this case, prior to breeding, an

agreement that reflects the relationship of the farmer with a scientific institution is to be generated and signed. The agreement also is to specify who will be the patentee and under what conditions remunerations will be allocated.

Patent holding gives farmers a right to set up a fruit nursery and grow fruit seedlings for sale. In this case, the duties of the farmer include:

- developing and introducing an effective technology for growing fruit seedlings;
- providing author's description of hybrids and varieties;
- producing seeds with high cultivar and sowing qualities on the basis of agreements with consumers of seeds; and
- generating and publishing seed catalogues periodically.

Seedlings grown in a farmer's nursery shall be subject to certification with an indication of varietal and planting qualities and the farmer must guarantee their conformity with standards. In general the *Law On Breeding Achievements* protects the intellectual property of farmers and enables them to work fruitfully on breeding new varieties of fruit crops.

In view of the above, the national project team developed and submitted two proposals to:

1. the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan a proposal to arrange for variety testing on demonstration plots created under the project to facilitate the obtaining of patents regarding the varieties bred by farmers.
2. the Chairperson of the Committee for Agriculture and Water Resources of the Legislative Branch of *Oliy Majlis* (the Parliament) of the Republic of Uzbekistan a proposal to legalize the acquisition of patents by farmers who have developed new varieties of fruit crops in demonstration orchards, established under the project.

Other recommendations

In accordance with the action plan agreed at the Regional Workshop on the Farmers' Rights, organized on 21-24 April 2009, national partners have developed the following recommendations to support farmers in maintenance the fruit crops diversity in their fields:

- promote joint efforts of all stakeholders, local government authorities, as well as district and regional administrations, associations, farms, research institutions and other organizations on the conservation of agricultural biodiversity in the region, as well as strengthen the role of farmers and farms in this area;
- use media, round table discussions and training workshops to explain in more detail to farmers the advantages of local varieties as compared to introduced ones as they are better adapted to the environment, suitable for different types of processing and, particularly, resistant to stressful environmental factors (e.g. possessing tolerance to soil salinization, heat resistance, drought tolerance, resistance to late spring frost);

- propose legislative support of investments in new technologies and techniques for planting stock; and
- increase the role of local communities in forest management.

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National Policies on Farmers' Rights



FARMERS' RIGHTS IN KAZAKHSTAN

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Introduction

Heterogeneous agriculture emerged in the early 1990s in the Republic of Kazakhstan as a result of former collective and soviet farms having been reformed. Necessary legal documents governing legal, organizational, and economic development fundamentals for agribusiness were adopted.

Currently, the following types of economic entities are in operation in the country's agriculture sector:

1. agricultural enterprises: limited liability partnerships (LLPs); production cooperatives (PC); joint-stock companies (JSC) and others;
2. *krestyan* (farming) enterprises; and
3. households.

The latter two forms of enterprise, based on private ownership, are the leading ones and for today they generate up to 75% of all produced gross agricultural production in the republic.

The major laws of the Republic of Kazakhstan that regulate and protect the rights of *krestyan* (farming) enterprises (hereinafter *krestyan* enterprises) in agriculture are the following:

1. *Law on Krestyan (Farming) Enterprises*, 1998;
2. *Law on Protection of Breeding Achievements*, 1999;
3. *Law on Economic Partnerships*, 1999;
4. *Law on Agricultural Partnerships and Their Associations (Unions)*, 2000;
5. *Law on Plant Quarantine*, 2002;
6. *Law on Seed Production*, 2003;
7. *Law on Rural Consumer Cooperative of Water Users*, 2003;
8. *Law on Credit Partnerships*, 2003;
9. *Law on Micro-Credit Organizations*, 2003;
10. *Land Code of the Republic of Kazakhstan*, 2003;
11. *Forest Code of the Republic of Kazakhstan*, 2003;
12. *Water Code of the Republic of Kazakhstan*, 2003;
13. *Law on State Regulation of Development of Agro-Industrial Complex and Rural Areas*, 2005.

Legal status of *krestyan* (farming) enterprises

The basic laws defining the legal status of enterprises are the laws *On Krestyan (Farming) Enterprises* (1998) and *On Private Entrepreneurship* (2006). Under these laws a *krestyan* enterprise is defined as a separate business entity. Farmers independently determine the direction of their activities, the structure and volume of production, growth, the processing and realization of products, as well as the resolution of other issues related to management of the enterprise. This means that each farmer is provided the right of free choice of crops to cultivate as well as the variety and at the same time, has free access to genetic resources of fruit crops and grapes, as well as the right to conserve and exchange reproductive material.

Private property is inviolable and protected by the *Constitution*. In addition, the right to private ownership of used lands is assigned to farmers in accordance with the *Land Code*, adopted in 2003.

The head of the *krestyan* enterprise can be any legally able-bodied citizen of the Republic of Kazakhstan who has reached the age of 18. Property of *krestyan* enterprises belongs to its members on the right of common or joint ownership.

Plantations on plots of land, associated buildings, land reclamation and other construction, productive and working cattle, poultry, agricultural and other machinery and equipment, vehicles, implements and other property purchased for the enterprise from general funds of its members are considered property of the members of the *krestyan* enterprise. Fruits, products and incomes derived from activities of the *krestyan* enterprises are considered common joint or common equity property of members of *krestyan* enterprises, and are used by agreement among them.

Property and right of land use in a *krestyan* enterprise are inherited as stipulated by civil legislation according to the law or testament. Heirs who continue to maintain a *krestyan* enterprise are exempt from payment of state duty on inherited property and receive as part of their inheritance the right to land use.

Legal frameworks regulating the use of land, water and forest resources are fixed in such basic laws as the *Land Code of the Republic of Kazakhstan* (2003), the *Water Code of the Republic of Kazakhstan* (2003) and *Forest Code of the Republic of Kazakhstan* (2003), as well as being reflected in the *Law On Krestyan (Farming) Enterprises* (1998) and other regulatory legal acts.

At the same time, it should be noted that at present in Kazakhstan there are no direct legal rules regulating the activities of *krestyan* and farm enterprises in the area of conservation and use of biodiversity of plant genetic resources. But, as it can be seen at a glance, that farmers' fields and orchards are of a great importance as repositories of biological diversity, it should be noted that there is a quite a massive amount of legislation in the area of regulation of activities of *krestyan* enterprises. Since Kazakhstan in 1994 signed the *Convention on Biological Diversity*, despite the

absence of specific legislation on conservation of plant genetic resources, the country strictly follows international treaties and agreements.

Certain provisions of the Laws *On Protection of Breeding Achievements* (1999), *On Plant Quarantine* (2002), *On Seed Production* (2003) indirectly relate to farmers/ horticulturists in the context of conservation and use of agricultural biodiversity (local varieties of fruit crops).

In terms of organizational, economic and financial mechanisms for the functioning of *krestyan* and farm enterprises, an important place is occupied by regulatory/legal provisions of such general laws for agricultural enterprises as *On Financial Leasing* (2000), *On Credit Partnerships* (2003) and *On Microcredit Organizations* (2003).

Not the least in importance in organizational and economic terms are the Laws *On Production Cooperative* (1995), *On Rural Consumer Cooperatives* (1999), *On Agricultural Partnerships and Their Associations* (2000) and *On Rural Consumer Cooperatives of Water Users*, all of which provide a legal framework for joining farmers' efforts in solving various socio-economic issues.

All the legislation and regulations acts mentioned above, as well as others related to the agrarian sector of the country, meet the requirements of free enterprise in market economies, stimulate citizens' initiatives in improving the efficiency and competitiveness of production, and create a favorable climate for attracting investments.

The system of private property and other farmers' economic rights is been regulated by land laws founded in the *Land Code of the Republic of Kazakhstan* and the *Law On Krestyan (Farming) Enterprise*.

Access to land

For farming, plots of land are granted to citizens of the Republic of Kazakhstan according to the right of private ownership or to the right of temporary payable land tenure with terms up to 49 years.

Krestyan enterprises, possessing the right to private ownership of land, are entitled to:

1. autonomous management of the land for use in agricultural production;
2. ownership rights to crops and agricultural plantations as well as agricultural products and incomes from their sale;
3. use for the needs of the farm of resources available on the plot of land, including sand, clay, gravel and other common natural resources such as turf, forest areas, surface and ground water as well as any other useful properties of the land;
4. full compensation for losses in case of seizure (buy-off) of the land plot for the needs of the government;

5. construct housing and other buildings (production facilities or structures) in accordance with the zoning of land for farming needs that are not contradictory to the target purpose of plot of land; and
6. conduct irrigation, drainage, and other land improvement activities, build ponds and other water reservoirs in accordance with established construction, environmental, sanitary and other special requirements.

Remaining rights may be limited by the contract for temporary use. Hunting, fishing, gathering of medicinal herbs, berries, mushrooms and other natural products, as well as other activities on the land assigned to a *krestyan* enterprise, are allowed only with the consent of the head of the farm. *Krestyan* enterprises independently use their products and realize profits from these products from internal and external markets.

Without a normal land market it is impossible to expect any investments, neither internal nor external. Circulating assets are necessary for the development of any production, and they can be obtained mainly in the form of credit. But credit requires some security. Worldwide, land serves as a security. Legalized private ownership thus ensures development of mortgage crediting, with banks loaning to farmers against a pledge of land. Such credit is provided by Article 17 of the *Law of Republic of Kazakhstan On Krestyan (Farming) Enterprises* and Article 76 of the *Land Code of the Republic of Kazakhstan*.

Farmers' intellectual property rights

The legal regulation of property and personal non-property relations arising in connection with the creation, identification, selection, legal protection and use of breeding achievements is of great importance for farmers' activities. Particularly, the facilitation of plant breeding efforts and strengthening of capacity in the area of plant breeding, with special regard to adaptation to environmental, economic and social conditions of a particular locality is critical. Genetic diversity of plants increases selection options and provides protection against future adverse conditions such as extreme and volatile environment. According to the *Law of the Republic of Kazakhstan On Protection of Breeding Achievements*, rights to breeding achievement shall be protected by the law and are confirmed with intellectual property rights. A plant variety certificate guarantees an exclusive right of a holder to use the breeding achievement, and establishes the priority and authorship of the plant breeder. Thus, legal regulation of the legal status of a plant variety certificate holder and an author of a breeding achievement and, his/her financial interests may encourage a farmer to breed new plant varieties.

Issues on protection of intellectual property of *krestyan* enterprises are being regulated in Kazakhstan, but, regrettably, no legal or regulatory protection with regard to traditional knowledge has yet been adopted. Farmers maintain technical documentation, but traditional knowledge has no legal protection or documentation.

Farmers as seed producers, according to the *Law of the Republic of Kazakhstan On Seed Production*, have the right to independently determine the volume of seed production, with the exception of certified seed producers, who must ensure production of seed in volumes not less than specified by the authorized government body in the area of seed production quotas. However the Law binds producers of seed (planting material) to:

1. comply with the technology requirements, production scheme, rules of storage and realization of seeds, approved by authorized government body in area of seed production, and to ensure their quantitative and qualitative safety; and
2. use for sowing the seeds of varieties included in the State Register of breeding achievements permitted for use in the Republic of Kazakhstan, as well as varieties recognized as promising.

Introduction of quite a large list of requirements for seed producers results in a high level of responsibility for producers in their seed production activities. The State Register of breeding achievements registers varieties after testing. Regarding imported varieties, farmers must at least obtain permission from agencies responsible for quarantine inspection.

Phytosanitary protection

Great importance in biodiversity conservation of plant genetic resources is given to the conduction of activities to control disease, weeds and pests. Control measures are conducted according to the *Law of Republic of Kazakhstan On Protection of Plants* and the *Law of Republic of Kazakhstan On Plant Quarantine*.

State economic support to *krestyan* (farming) enterprises

The main legislative act, providing farmers the right to receive government support, along with the basic *Law On Krestyan (Farming) Enterprises*, is the *Law On State Regulation of Development of Agro-production Complex and Rural Areas*, on the basis of which subsidies for agribusiness (including activities of *krestyan* enterprises are provided in the form of economic incentives for the development of agribusiness sectors under the following conditions:

1. cost effectiveness of subsidy assistance aimed at the development of agribusiness sectors; and
2. improved quality and competitive ability of produced goods.

Subsidy assistance is provided for the following areas:

1. lowering of interest rates for crediting of farmers and providing them with agricultural machinery and equipment;
2. conservation and development of the gene pool of plant varieties that have a high value;
3. development of plant production;

4. increased yield and improved quality of plant breeding goods, lowering of prices on petroleum, oil, lubricants and other tangible assets that are necessary for springtime fieldwork and harvesting operations through subsidies per one hectare ploughed for priority crops identified by the Government of the Republic of Kazakhstan; and
5. establishment and maintenance of new orchards as well as growing planting material of perennial plantations of fruit and berry plantations and vineyards.

According to the *Law of the Republic of Kazakhstan On Agricultural Partnerships and Their Associations (Unions)*, farmers have a right to participate in agricultural partnerships to satisfy the needs of the members in crediting and other financial services including banking. According to the *Law of the Republic of Kazakhstan On Financial Leasing*, a farmer has a right to:

1. own and use the leased land upon terms of a lease contract;
2. demand quality and completeness of leasing and delivery period from the seller;
3. reclaim lease payments made in advance in case of unilateral cancellation of the agreement by the lessor;
4. forgo the leased land or request a replacement of the leased land and cancel the contract in cases when the leased land has not been delivered;
5. request compensation for losses in case of failure to fulfill or of inadequate fulfillment of the lease contract provisions by the lessor; and
6. request a reduction in the amount of the lease and lease payments, if use conditions outlined in the lease contract have deteriorated by force of circumstances beyond his/her control.

Provisions of the *Tax Code of the Republic of Kazakhstan* on the special tax treatment regime for *krestyan* enterprises also relates to financial support of farmers. *Krestyan* or farming enterprises have a right to autonomous choice of the special or regular tax treatment regime. The special tax treatment regime that comes down to payment of a single land tax also applies to activities of *krestyan* farms

At the same time, according to the *Law On Private Entrepreneurship*, *krestyan* and farm enterprises are regulated as entities of small entrepreneurship within state support for development of small and medium business in the country, and in accordance with the *Law On Krestyan (Farming) Enterprises* are entitled to following benefits:

- under the conditions provided by legislation, they are exempted from payment for added power of electricity, heat, water-supply and sanitation with application of legislation of the Republic of Kazakhstan on natural monopolies and regulated markets;
- they can open accounts in banks of second level with state participation and with charge collection;
- they can submit financial statements in a simplified manner, as individual entrepreneurs;

- they can use their preferential right in placing orders for public expenditures, conditions of which are determined by the Government of the Republic of Kazakhstan; and
- they can obtain statistical and information services (means), as well as scientific/research developments and technologies on preferential terms within the funds allocated in the state budget for a certain year within state financial support for small entrepreneurship.

The legal framework regulating insurance of farmers' property is incorporated in the *Law of Republic of Kazakhstan On Insurance, On Compulsory Insurance in Agribusiness* (2004) and *On Mutual Insurance* (2007). However, it should be noted that today the right of farmers/horticulturists is considerably diminished in obtaining state financial support on insurance of future (anticipated) yield, total or partial loss which frequently occurs because of adverse weather-climatic conditions (frost, hail etc.). This issue is on the agenda, and there is hope that it will be resolved in the short term in the course of improvement of the overall legislative framework for insurance in agriculture in the country.

Conclusions

- a. According to the active legislation of the Republic of Kazakhstan, each farmer has free access to genetic resources of fruit crops and grapes. Towards commercialization, farmers need to follow the *Law of the Republic of Kazakhstan On Protection of Breeding Achievements* (1999). The State Register of Breeding Achievements, permitted for use, includes 66 apple varieties, 7 pear varieties; 5 apricot varieties and 27 grape varieties, as well as 27 clone varieties of wild apple and 16 clone varieties of common apricot.
- b. Varieties are included in the *State Register of Released Varieties* upon completion of variety testing. As regards imported varieties from abroad (if the variety has not yet been included in the Register, then farmers are allowed to sell it in small quantities on markets until the end of testing), then a farmer should, at least, receive permission for a quarantine inspection. If local varieties have not been included in the State Register, then farmers with an intention to do so – fruit breeders – are in a position to grow them on their land plots. Upon completion of new variety testing, results are summarized and submitted to the State Variety Testing Commission.
- c. If a fruit and grapevine variety is absent in the State Register, then a farmer should obtain permission from relevant state agencies to import such plants from other countries.
- d. A right to conservation and exchange of propagation material is universal.
- e. A right to receive benefits from using plant genetic resources has not yet been considered and should be.
- f. A right of free choice of crop and variety has been granted to farms and farmers. They should order seedling materials from nursery enterprises.

- g. Since the government is providing support in maintaining fruit nursery farms, there is strict control over the production activities of farmers. The Agricultural Management Department ascertains a network of fruit nurseries and their operating zones, issues certificates for production and sale of planting materials of fruit crops and grapes.
- h. Records on fruit nursery farms and mother stock plantations are entered into books, documents on the establishment of mother stock plantations are filed, mother stock plantations and woody grafts of clone parent stock are tested, variety and quarantine certificates are issued, while the planting material is supplied with a label and permission for sale is issued on the findings of a commission.
- i. Agricultural land has either been sold or rented to farmers.
- j. The Government provides subsidies for establishment of new orchards and lowering costs of orchard maintenance as well as the cost of POL (petroleum, oil, lubricants), mineral fertilizers, pesticides, and others.
- k. The country has created regional outreach centers for farmers including fruit farmers.
- l. Subdivisions of the State Holding *Kazagro* in each district provide free-of-charge services.
- m. Each farmer has a right to take part in the decision-making process, if he/she has knowledge, experience, and rational proposals.
- n. Only farmers are entitled to manage products of their labor.
- o. If a farmer breeds a new variety of fruit crops or grapes, then the State Variety Testing Commission of the Ministry of Agriculture of the Republic of Kazakhstan and patent offices of the Ministry of Justice of the Republic of Kazakhstan should issue relevant documents.
- p. Farmers are entitled to documentation and protection of traditional knowledge.

Governors' offices (*akimats*) in each district have created public councils of farmers. Current problems are initially discussed at meetings of the councils attended by farmers in order to develop approaches to their solutions. Only after this, *akimats* make the final decisions. The most capable fruit farmers are elected to become part of district public councils.

All legal and regulatory documents aimed at complete economic liberalization of the agrarian sector adopted and active during the years of reforms have, naturally, created for all peasants the necessary legal and socioeconomic conditions for free activities. Farmers' rights are protected.

Recommendations

1. In the agrarian sector of Kazakhstan, one important component of which are *krestyan* households and farms, private households function and develop according to the laws of the market economy and produce about 75% of all gross agrarian output. Farmers independently define the objectives of their activity, the

- structure and volume of production and manage the production, processing and sale of their products. This means that every farmer has the right to free choice of which crops and varieties to cultivate and, at the same time, he/she has free access to the genetic resources of fruit crops as well as the right to conserve and exchange reproductive material. Here the basic laws defining the legal status of *krestyan* households and farms in the Republic of Kazakhstan are the *Laws On Krestyan (Farming) Enterprises* (1998) and *On Private Entrepreneurship* (2006).
2. In spite of the absence of special laws in the area of conservation and use of biodiversity and plant genetic resources by farmers in the Republic of Kazakhstan, the state strictly follows international conventions on rights and agreements. However, active normative and legal acts on the protection of breeding achievements and on plant and seed quarantine were accepted in the Republic. The Government actively assists in the implementation of this task. Other normative acts giving farmers full rights for free entrepreneurship activity, as described stated in this report, simultaneously provide for the conservation and rational use of existing natural resources and protection of the environment (e.g., the *Land Code*, the *Forest Code* and the *Water Code* as well as other legislative acts).
 3. Laws promulgated in the past and those currently active in the agrarian sector and in the areas of natural resource use and development are constantly being perfected, taking into account the modifications of social and economic conditions in the country and the need for practical application of advanced foreign experience. For instance, the new *Land Code*, accepted in 2003 and now in force, includes private property under the lands of agrarian use. This is not paralleled in any other post-Soviet country. Today nearly 1,000,000 ha of land for agrarian use are sold as private property in the Republic. This establishes a free land market and an expansion of farmers' rights in the field of land use.

At the same time, it is obvious that it is necessary to establish a normative and legal basis for the regulation of the functioning and further development of private households that produce about 60% of the gross output of fruits, berries and vegetables, 70% of potatoes as well as 75% of cattle.

At present there are about 1,700,000 private households, that include horticulturalists in the country. Only the *Civil Code* of Kazakhstan regulates the functioning of private households that supply about 50% of the gross agricultural output of the Republic, and they are not included in the category of equal productive units of the agrarian sector. The State does not support them in practice and does not regulate their activity through market mechanisms.

For this reason, in our opinion, it is necessary to accept the special *Law On Private (Farm) Households* as it exists in a number of countries, for instance, in Russia, where a similar law has been in force for a long time.

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FARMERS' RIGHTS IN KYRGYZSTAN

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Introduction

Analysis of national legislation of the Kyrgyz Republic for regulating the legal relations arising from the process of creation and functioning of *krestyan* (farming) enterprises (hereinafter *krestyan*) and certain legislative acts aimed at the establishment and protection of the rights of farmers was conducted on the following issues:

- a. right of access to genetic resources;
- b. right to the preservation and exchange of reproductive material;
- c. right to receive benefits from the use of genetic resources;
- d. freedom of choice of crops or varieties to grow;
- e. right of access to and use of land;
- f. right to receive financial and technical support from the state;
- g. right to education, by obtaining knowledge;
- h. right to receive legal support at the national and regional levels;
- i. right to contribute to and participate in decision-making;
- j. right to the results of their work;
- k. right to intellectual property rights in the breeding and use of varieties of crops;
and
- l. right to documentation and protection of their traditional knowledge.

In addition to the analysis of legislation, selected laws and regulations of the Government of the Kyrgyz Republic relating to provision of support to the rights of farmers and rural producers on the above issues were analyzed. Results of the analysis are given below.

The current situation

Upon completion of land reform in the Kyrgyz Republic, a legislative framework was established for the development of private farms on land of private property with restrictions aimed at protecting the integrity of the country, the environment, biological diversity (the prohibition of the introduction of certain plant species that can damage endemic species of plants) and protection of socially vulnerable groups of population (the transparent and equal distribution of land shares to all the inhabitants, depending on the composition of the family).

Over the past years, significant progress has been made in carrying out agrarian reform, as shown by the fact that annual growth of gross agricultural output increased by an average of 6%. In 2008, over 90% of agricultural production was in the private sector, with the proportion of *krestyan* farms amounting to over 44%. More than 286 thousand *krestyan* (individual) farms and approximately 700 different organizations, including 462 cooperatives, were established. As a result, the Kyrgyz Republic managed to achieve self-sufficiency for certain types of food products, which solved the main problem of food security at the level of minimum needs of the population.

According to the Rome Declaration, adopted on 17 November 1996, Kyrgyzstan, as a member of the world community, committed itself to “pursue policies aimed at eradicating poverty and inequality, the physical and economic access for all and at all times to a sufficient diet with fully adequate food.”

Despite some problems, Kyrgyzstan to date provides its population with the basic kinds of agricultural products, including meat, milk, vegetables, and to some extent cereals. At the same time, the poor quality of products, continuous improvement needs of the population and food prices, low incomes, modest level of exports, the growth of food imports in general make it difficult to ensure food security at the level of consumption standards. The Republic as a whole does not produce essential products such as sugar and vegetable oil. Domestic production of wheat, does not stand up to international competition; the domestic quality does not conform to the standards and has led to the import of flour or durum wheat from Kazakhstan.

Whenever possible, the Government supports farmers through provision of seeds and technical resources, commercial loans and grants. In the national budget, each year funds improving the epizootic situation through the repair and restoration of water facilities, plant protection and quarantine are allocated.

In the provision of farmers and peasants with necessary information, a significant role has been played by Rural Advisory Services (RAS) and the Kyrgyz Agricultural Market Information System (CARIS), established in all parts of the country. Given that about 80% of conflict situations are due to the lack of legal knowledge among farmers and peasants, it is important that they are guaranteed access to legal aid. In this regard, in order to protect the interests of farmers and villagers, an objective and independent advice on legal matters to ensure fair and accurate implementation of the Land Code and agricultural legislation was provided.

Legislation for the farmers' rights protection

Standards of the *Civil Code* establish the basic concepts and the legal status of farms, their formation and registration. The *Constitution of the Kyrgyz Republic* and the *Civil Code* regulate the protection of private property, including agricultural products. The *Law of the Kyrgyz Republic On Krestyan (Farming) Enterprises* of 3 June 1999 No 47 guarantees protection of the rights and legitimate interests of farmers and their family members. The

Law also establishes that «State authorities and local authorities are obliged to promote and strengthen the farm and have no right to interfere in the economic, financial and other farm activities, except as provided by the law of the Kyrgyz Republic».

The *Land Code of the Kyrgyz Republic* of 2 June 1999, number 45, regulates land tenures in the Kyrgyz Republic, the implementation and termination of *land rights* and their registration. In accordance with Article 49 of the *Land Code of the Kyrgyz Republic*, which defines the rights of the land owners and land users, the owner of the land and the land user has the right:

1. to independently farm the land and use it for that specific purpose;
2. to prevent any attempt to violate the right to the land, and any invasion on the land against his will;
3. to ownership of the agricultural crops and other plants resulting from the use of land, and income from its realization;
4. to use in the prescribed manner available on the land plot small deposits of common minerals found on the surface of the land, forest and water resources, as well exploit other useful properties of the earth;
5. to cover damages in cases stipulated by legislation of the Kyrgyz Republic;
6. to construct buildings and facilities not inconsistent with the intended purpose of land, subject to architectural planning, construction, environmental, sanitary, fire and other special requirements;
7. to establish irrigation and drainage systems, and carry out other reclamation work in accordance with the construction, environmental, sanitary and other special requirements;
8. to carry out civil legal transactions with regard to land rights within the limitations established by this Code and the *Law of the Kyrgyz Republic On the Management of Agricultural Land* (2001); and
9. to perform other actions stipulated by the land legislation.

It follows from the above that a land owner has an ownership *right to genetic resources* derived from biological resources that grow on his/her site. In order to legitimize his/her right to the genetic resources, the owner of land where the resource was grown (received) must register his/her right to it and obtain a patent from the national authority on intellectual property protection.

The draft *Environmental Code of the Kyrgyz Republic* has not yet been adopted by the Parliament of the Kyrgyz Republic, but his *Chapter 24 "Access to Genetic and Biological Resources"* primarily provides for state protection of wild genetic and biological resources that are owned by the state.

The *Law No 4 of the Kyrgyz Republic On the Management of Agricultural Land* of 11 January 2001 (as amended by the Act No 129, dated 25 July 2006, No 189 of 24 November 2006 and No 83 of 12 June 2007) governs the legal relations of agricultural land management destination, and it is aimed at ensuring the effective and safe use of land. The Act provides that the right to acquire private ownership of land occurs

when the purchaser — a citizen of the Kyrgyz Republic — has lived for the last two years in the rural area.

Thus the legal framework for the widespread introduction of market relations in agricultural production for all farmers to ensure equal rights to access and use of land, as well as access to genetic resources conservation and exchange of reproductive material, allows farmers to benefit from the use of genetic resources, freedom of choice of crops or varieties to grow, and the availability of the results of their work.

In the legislation on agriculture, *the right of access to genetic resources* is not clearly recognized, but for farmers there are no strict legal barriers to access to genetic resources, except in limited circulation, or under legal restrictions. The *Law No. 79 of the Kyrgyz Republic On Secret Inventions* of 17 March 2006 provides for the public authority in the field of intellectual property applications for a patent on an invention by classifying the work, and applications that contain data resulting from this work, as identification of information constituting state secrets. Arrangements for this work are established by the authorized public agency in the field of intellectual property.

Small farmers growing fruits have *access mostly to the current market* and to the common varieties and species. In recent years, the widespread adoption of improved varieties and selling in domestic markets has not been observed, and participating in international exhibitions and sale of elite varieties is quite expensive. In addition, many farmers in their relatively small holdings prefer to cultivate a cultivar of one of the basic staples: cereals, pulses, etc. Fruit crops, due to the fact that they are not food essentials, their fruiting is long-term (4-5 years) and they are grown mainly in the home compound and backyards rather than in agricultural field, are considered secondary. Farmers' varieties are registered in accordance with the *Law of the Kyrgyz Republic On Legal Protection of Breeding Achievements (1998)*, which is detailed below.

It should be noted that the Security Council of the Kyrgyz Republic considered on February 12, 2009, the proposed regulation *On the State of the Environment and Measures to Ensure the Ecological Safety of the Kyrgyz Republic*, and recommended that the Government and the National Academy of Sciences of the Kyrgyz Republic study the issue of establishment of a genebank for genetic resources of animals, plants and microorganisms. This will also help farmers to have access to these resources.

It should be noted that *the right of farmers to receive financial and technical support* from the Government arises upon the occurrence of force-major (drought, floods, fires) or in cases where a farmer expresses his intention to grow certain varieties using the seeds provided by the government at preferential prices, in this case, the farmer gets finance support from the government. In cases where farmers want to grow other varieties, they can grow them without any financial and technical support from the government.

The Kyrgyz Republic, to ensure food security, has to plan for subsidies to farmers to encourage them to include local varieties. However, the present budget of the

Republic, together with the current intensification of agricultural production to increase productivity and profit from growing “commercial” popular varieties, will apparently prevent these preferential conditions from being introduced for farmers.

The right to education is guaranteed to all citizens of the Kyrgyz Republic who desire to take advantage of it, but the quality of learning and the knowledge acquired in university education come with some constraints that require complex solutions.

The SCS - Rural Advisory Services and Offices LARC system — was created with support from USAID and the World Bank system and provides legal support to farmers at both national and regional levels.

The right to contribute to and participate in decision-making by farmers is regulated by local and national representative bodies (local *keneshes* [councils], *Zhokorgu Kenesh* [Supreme Council]), through associations and unions. This right, however, is exercised piecemeal — intermittently in cases of government decisions affecting their farmers’ rights. For example, by establishing a monopoly purchaser, low prices were set for agricultural products grown, as was the case with beans in the Talas region. In this region, the Government established one purchasing agent, a monopolist, who set the purchase prices for farmers’ locally grown produce (beans). After the farmers exercised their right to participate in decisions by addressing appropriate proposals to the state authorities, the decision was reversed and a new decision was adopted granting the right to buy beans to other companies. In connection with the emergence of competition between buyers, of course, the purchase price for beans increased, which has had a positive impact on the welfare of the farmers in the Talas region.

The right to intellectual property rights in the breeding and use of varieties of crops is protected by the *Law of the Kyrgyz Republic On Breeding Achievements* No. 79 of 13 June 1998. While the Law is aimed at protecting intellectual property of breeders, in cases where genetic resources stored by farmers have been used, it is made possible for farmers’ participation in conjunction with breeders.

The Law provides that the criteria of protectability of selection achievements include:

1. Novelty. Varieties of plants are considered new if on the date of filing the application for a patent the seeds or pedigree material of the breeding achievement were not sold and not otherwise transferred to other breeders, their legal successors or with their consent for the use of breeding achievements:
 - in the territory of the Kyrgyz Republic more than one year prior to that date;
 - in another state more than four years, or if it relates to grapes, woody ornamental plants or fruit crops, more than six years prior to that date.
2. Distinctiveness. Varieties of plants are considered to be distinguishable if clearly different from any other known breeding achievements existing at the time of filing.
3. Homogeneity. Varieties of plants are considered to be homogeneous if, taking into account the peculiarities of breeding plants and animals, they are fairly uniform in their characteristics.

4. Stability. Varieties of plants are considered stable if their essential characteristics remain unchanged after repeated reproduction or, in the case of a particular cycle of reproduction, at the end of each cycle of reproduction.

The right to file an application for a patent (hereinafter - application) pertains to a breeder, the employer or their successor (hereinafter - the applicant). If the new varieties of plants were founded by several persons jointly, they have the right to a joint filing.

The application may be filed through an authorized person who holds the power of attorney in the case of obtaining a patent. Individuals or legal entities of other states that have no permanent residence or location in the Kyrgyz Republic must, in order to obtain a patent and maintain it go through patent attorneys of the Kyrgyz Republic, registered in the public authority in the field of intellectual property, unless otherwise specified by an international treaty of the Kyrgyz Republic.

Examination of the application of selective achievements includes a preliminary examination and testing of the claimed selection achievement in terms of distinctiveness, uniformity, stability, and on the basis of a positive conclusion to requests to register breeding achievements and issue a patent.

A patent for a new variety of plants is issued on behalf of the Kyrgyz Republic, signed by the head of the public authority in the field of intellectual property and issued in the name of the applicant. The validity of a patent for plant varieties is 20 years from the date of registration of the claimed selective achievements in the State Register of protected breeding achievements. With regard to grapevines, woody ornamental plants, fruit crops and forest species, including their rootstocks, as well as the animals, the term of a patent is 25 years.

The right to documentation and protection of traditional knowledge is regulated by the *Law N 116 of the Kyrgyz Republic On Protection of Traditional Knowledge* of 31 July 2007 which defines traditional knowledge as knowledge, methods and techniques, including the use of genetic resources used in various fields of human activity, that are passed from one generation to another with a certain order and meaning. This knowledge is maintained and adapted to the different needs of local communities and holders of traditional knowledge and has some value for the development of various spheres of life.

Holders of traditional knowledge are defined as the local community, individuals, legal entities of any organizational-legal forms and forms of ownership that have traditional knowledge; and the term “genetic resources” includes all animals and plants which may be used by holders of traditional knowledge for certain practical results in a given field.

The objectives of state regulation of traditional knowledge are: legal protection; the promotion of conservation; the wide application of traditional knowledge in various

fields of human activity; facilitation of the use of traditional knowledge, including knowledge based on genetic resources in industrial production as well as further commercialization of products resulting from their use. (This Law of the Kyrgyz Republic is a new one and all mechanisms have not yet been worked out yet). The workshop organized by the State Service of Intellectual Property of the Kyrgyz Republic provided information about a list of necessary documents, requirements for filling in applications, and introduction of state duties for registration and granting of the right to using traditional knowledge amounting to about 80 US Dollars. Patenting of knowledge in the Kyrgyz Republic is not allowed.

When there is a patent application that involves a product on the basis of traditional knowledge, disclosure of the origin of traditional knowledge used as a prototype or analogue is required. The applicant must indicate and make public the source of the traditional knowledge. In this case, the legislator has adopted a norm aimed at disseminating traditional knowledge and promoting its carrier. (Perhaps this is one of the forms of distribution of benefits and incentives for farmers).

The holder of a certificate that is registered under the heading of knowledge has the right to receive remuneration from the owner of a patent for an invention created with the use of this traditional knowledge.

A person may be granted the right to use registered traditional knowledge provided a contract between them and the holders of traditional knowledge, has been agreed to. Accordingly, the holders of a contract for use of traditional knowledge may provide to another person the right to use traditional knowledge under the use of the rights, terms, and order of payment specified in the terms and conditions are determined by agreement between the parties. Registration of a contract is by the authorized body and is subject to payment of the prescribed fee.

The agreement on a mandatory basis should include a provision for retention payments as a result of the use of traditional knowledge to the Development Fund for the local community or the State Fund for the development of the use of traditional knowledge. (Currently, unfortunately, there are no such examples.)

It should be noted that the Government of the Kyrgyz Republic is taking measures for the development of agriculture and food security. Thus, the Decision No 465 of the Government of the Kyrgyz Republic of 22 June 2004 approved the *Concept of Agrarian Policy of the Kyrgyz Republic until 2010*. Likewise, the Decision No 116 of the Government of the Kyrgyz Republic dated 11 February 2009 approved the *Program of Action of the Government of the Kyrgyz Republic for 2009*, in which rural farming and the processing industry support agricultural producers by developing a system of state support of agriculture such as:

- purchase of agricultural equipment through funds granted by the Government of Japan, the PRC;

- the development of rural advisory services in the areas of agriculture, marketing, etc. through the opening of the centers;
- supporting the financial status of rural producers through the writing off of bad debts on budgetary loans and foreign loans for the years 1992-2007;
- introduction of the cost of subsidized seed farms producing and selling elite and super-elite seeds; and
- expansion of acreage planted to crops to 1,165 hectares, including expansion of the wheat crop acreage to 420 hectares.

Conclusions

We hope that the leadership of the comprehensive measures aimed at developing the agricultural sector through the study of international experience will help ensure the food security of the country. Unfortunately, issues concerning incentives for farmers to grow traditional varieties and genetic resources have not been clearly outlined in governmental acts.

According to the above-mentioned decisions of the Government of the Kyrgyz Republic, its actions are aimed at developing the agricultural sector as a whole, as a major player on the scale of food security. To encourage farmers to grow varieties and local genetic resources, it is necessary to initiate a new decision of the Government aimed precisely at supporting the agricultural sector.

Recommendations

An outcome of the Regional project “*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*” is the development and submission of drafts the following laws:

- the *Law of the Kyrgyz Republic On Amendments of the Law of the Kyrgyz Republic On Krestyan (Farming) Enterprises*, where it is planned to supplement Article 5 of the *Law (Rights of Krestyan Enterprises)* with a new sub-paragraph that should read as follows: “13) for government support in case of breeding local varieties of fruit crops and their wild relatives.”
- article 9 “Powers of Governmental Bodies in the Area of Local Self-Governance” of the *Law of the Kyrgyz Republic On Local Self-Governance and Local State Administration* should be supplemented by the following amendment to sub-paragraph 10, which shall read as follows: “10) compensation for additional expenses incurred by local self-government bodies as a result of decisions taken by public authorities including the support of the *krestyan* (farming) enterprises for propagation of local varieties of fruit crops and their wild relatives.”

As a result of this proposals, farmers appear eligible to receive support from the state for propagation of local varieties of fruit crops and their wild relatives and, in addition,

local authorities have a right to compensation from the government for spending funds to support farmers in their efforts in breeding local varieties of fruit crops and their wild relatives.

Consequently, the farmers will have the right to share features and species of flora and fauna in an equitable manner and also to receive benefits from commercial and other use of genetic resources. This sharing will be implemented on mutually agreed conditions with local administrative agencies and local communities providing such resources.

The traditional methods of use of genetic resources in accordance with existing cultural traditions should not conflict with the requirements and norms of conservation and sustainable use adopted by laws and other legal acts of Kyrgyz Republic.

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FARMERS' RIGHTS IN TAJIKISTAN

Samiev Tuychi

Introduction

Tajikistan participates in a number of international agreements and processes in the field of protection of genetic resources of plants. The most significant international documents signed by the Government of Tajikistan are the *Convention on Protection of the World Cultural and Natural Heritage* (1992) and the *Convention on Biological Diversity* (1997). In addition, within the limits of realization of bilateral cooperation of the Republic of Tajikistan with neighboring and other states in sphere of preservation of the environment, joint actions have been undertaken. However, regulations protecting wild relatives of agricultural plants in the Republic of Tajikistan are not designated in separate statutory acts. There is at present no precise delimitation of laws to regulate and protect genetic resources; the legislation of the Republic of Tajikistan is aimed at the regulation of such issues as land tenure, and plants only insofar as they exist on the land in question. In this regard it is necessary to improve the legislative base towards plant genetic resources conservation.

In recent years, government support to and *in situ* conservation of genetic resources is expressed in the enhancement of legislation, the encouragement of development projects as well as the establishment of new protected natural areas. Degradation of the natural environment, conservation of unique ecosystems, the presence of rare and endangered plant species, and the implementation of research and development projects necessitated the adoption of the Law of the Republic of Tajikistan *On Specially Protected Natural Areas*. The Government Decree No. 70 *Issues of the State Committee for Environmental Protection and Forestry of the Republic of Tajikistan* of 1 March 2004 initiated the establishment of the State Institution on Specially Protected Natural Areas (*Tajik National Park*) to oversee and regulate relations in the field of specially protected natural areas. However, beyond protected areas, the conservation of genetic resources is almost never observed. Therefore, there is a need for close involvement of local authorities, educational institutions, society in general and local communities in the campaign for the conservation of genetic resources. For this purpose, it is important to hold events to raise public awareness through media campaigns.

National research centers work closely with international institutes such as Bioversity International on the conservation of agricultural biodiversity in the country. Nevertheless, there is still a need to build on the experience gained and to develop

new project proposals for the creation of *ex situ* collections and *in situ* conservation of genetic resources with the involvement of regional and international organizations.

On 21 October 2011 a draft *Law of the Republic of Tajikistan On Conservation and Sustainable Use of Genetic Resources of Cultivated Plants* was submitted for consideration to the Committee *Majlisi Namoyandagon Majlisi Oliy* (Lower Chamber of the Parliament) of the Republic of Tajikistan on agricultural issues and the environment, and to another committee for legal review. The purpose of the proposed project for modeling a new national law is to establish the legal bases of a state policy in the fields of collection, conservation and research on, genetic resources of agricultural plants, including their wild relatives. These resources are necessary for the manufacture of foodstuffs and for agriculture, and also for defining the mechanisms for the scientific realization of research, selection and educational activities designed to maintain and protect the welfare and the historical heritage of the country for both present and future generations. The project for drawing up this law was proposed to promote the establishment of a uniform approach to activities in the field of the collection, conservation and rational use of plant agricultural resources and to promote regulation of these activities. It was adopted with the aim of developing legislation for the maintenance of food, ecological and bioresearch safety in the country and in other countries of region in order to decrease the level of famine and poverty and increase the well-being of people living in corresponding territories.

The law-drafting project takes into consideration all basic international principles developed by the world community in the field of agricultural biodiversity. In this draft law, general provisions are stated, the basic concepts are identified, features are described and major principles of a state policy for development of activity in this sphere are listed. In addition, the basis of legal, economic and organizational attitudes for the collection, conservation and use of agricultural planting resources are incorporated.

Special attention is given to questions of state policy, the powers of governmental bodies of local self-management and the participation of citizens in conservation activities and in the sustainable utilization of genetic resources of agricultural plants.

Access to genetic resources

In the legislation of the Republic of Tajikistan, there are no restrictions on farmers' rights access to genetic resources. Traditional selection, which has been carried out in Tajikistan over many centuries, made a significant contribution to the breeding of a number of valuable landraces. Among varieties cultivated in the country, the largest number of landraces grown are those of grain cereals, apricot, apple, mulberry and walnut.

A number of legislative acts on plant genetic resources have been adopted over the last few years. However, there is an urgent need to strengthen the legal framework regarding the conservation, collection and use of these resources. Tajikistan acceded

to the *Convention on Biological Diversity* and the *Cartagena Protocol on Biosafety* and became a member the International Union for the Protection of New Varieties of Plants (UPOV-Act 1991), International Seed Testing Association (ISTA), certification schemes of OECD, and the International Seed Federation (ISF).

Further improvement of conservation, and sustainable use of plant genetic resources requires increased public awareness. It is important that everyone - from politicians to ordinary people - understand the importance of the conservation and sustainable use of these resources. It is essential that everyone understands that the extinct plant genetic resources will never regenerate. It is important for the Republic of Tajikistan to become a member of the *International Treaty on Plant Genetic Resources for Food and Agriculture*.

Conservation of genetic resources on farm is one of the approaches used mainly for traditional and local crop varieties. On farm conservation is chiefly suitable for perennial crops. Intensive introduction of new varieties of annual and perennial plants has been displacing local and traditional varieties from farmers' fields, resulting in genetic erosion. It is often difficult to maintain annual and perennial crops in farmers' fields due to several factors. For example, the Pamir Biological Institute had put together a unique collection of local populations and varieties of grain legumes and traits by 1971. However, due to social and economic hardships, it was difficult to save this collection of genetic resources.

Biodiversity International, GEF, UNEP and other organizations, including farmers and individuals, involved in the project "*In situ/on farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*" are making considerable efforts in this area. Lessons learned from this project should be used to develop measures and project proposals to promote stable on farm management and improvement of plant genetic resources for food and agriculture.

Ongoing land reform and farm restructuring in Tajikistan resulted in a number of large farms shrinking and farming enterprises being established that are primarily interested in producing more products and increasing profits. Experience suggests that farmers are not interested in creating collections and on farm conservation of plant genetic resources. Therefore, sustainable maintenance of developed on farm collections requires support from regional and international institutes. The above project has established primarily collection nurseries and nurseries of fruit crops and their wild relatives. There is a need for assistance in creating further similar collections of fruit crops.

Access to improved varieties

Agricultural crops cultivated in Tajikistan represent a rich genetic diversity of species. For the most part, cultivated crops in Tajikistan consist of improved varieties; the economically-valuable traits of these varieties are well described. The cultivated

varieties have such characteristics as high crop efficiency, good adaptation to environmental conditions, resistance to abiotic stresses and pests and diseases.

The *Law of the Republic of Tajikistan On Seed Breeding*, No. 355 of 5 January 2008 provides for legal frameworks in the area of production and processing, certification and sale of seeds, seedlings, and plants as well as variety registration procedures and seed control.

The present law uses the following key concepts:

- seed production is an activity related to production and processing, certification and sale of seeds, seedlings, and plants as well as variety registration and seed control;
- hybrid seeds are first-generation seeds obtained as a result of crossing parent forms;
- normal seeds of local plants include seeds harvested from local plants and not from improved plants or genetically modified plants;
- pedigree seeds of local plants include ones produced from cultivated varieties of local crops; and
- the register of commercial varieties comprises a list of varieties permitted for commercial production and use.

According to Article 30 of the *Law of the Republic of Tajikistan On Seed Breeding*, seeds shall be registered with an authorized government agency for seed testing and registration. Variety and seed control in terms of planting and quality of each seed batch shall be exercised by an authorized agency for seed control and certification.

Number of released varieties of agricultural crops in Tajikistan

Crop name	Total	Introduced		Local	
		quantity	%	quantity	%
Pip crops	47	30	63.83	17	36.17
Berry crops	26	16	61.54	10	38.46
Citrus crops	4	4	100.00	0	0
Sub tropical crops	16	11	73.33	5	33.33
Nut bearing crops	12	6	50.00	6	50.00
Desert-pasture crops	1	0	0	1	100.00
Bushes	1	0	0	1	100.00
Total	310	190		120	

In accordance with the Law, the new plant varieties have to pass official testing of economically-valuable traits within three years. The best varieties, which excel over other varieties in indicators of economic value, are recorded in the Register of Commercial Varieties and zoned. In the Register, 310 varieties of 65 crops are zoned. Out of these varieties, 190 are introduced and 120 are locally improved varieties.

Apart from the Register of Commercial Varieties, Tajikistan has a National Database that includes 981 traditional and local varieties, including 660 grain crops, 209 grain legumes, 42 fodder crops, 40 oil-producing crops, 1 tobacco, 4 meadow plants and 20 fruits and berries.

Tajikistan is a member of the International Union for the Protection of New Plant Varieties (UPOV- Act 1991). In harmonizing the national system to UPOV 91, the *Law of the Republic of Tajikistan On Breeding Achievements of Agricultural Crops*, No. 672 of 29 December 2010 regulates legal protection of plant varieties and defines the legal basis for the rights of the breeder.

The authorized state body on testing, registration and protection of plant varieties ensures implementation of a unanimously agreed policy in the domain of plant varieties protection in the territory of Tajikistan. The authorized state body is appointed by the Government of the Republic of Tajikistan and will grant breeders' rights to the breeder of plant variety and will issue the certificate that attests the right of the breeder to protection of the new plant variety.

The authorized state body has the following competencies related to protection of plant varieties:

- to keep the Register updated and ensure availability of its information;
- to consider issues related to expert examination of the applications; and
- to issue the certificate for breeders' rights if the plant variety meets the requirements of Articles 8-11 of this Law.

The authorized state body adopts guidelines and instructions that are approved by the State Authority of the Agriculture Department. These guidelines and instructions should conform with the legislation of the Republic of Tajikistan on issues of plant varieties protection, including the procedures of review of applications for obtaining breeders' rights, the name of the plant variety, expert examination of the application, periodical publications, information, procedures of appeal, and date of registration of the plant variety in the Register.

In accordance with the *Law of the Republic of Tajikistan On Breeding Achievements of Agricultural Crops*, new varieties of plants are identified by traits that characterize this genetic type or combination of genetic types and that differ from other plants of the same botanical taxon by at least one characteristic. The variety can be represented by one or several plants and one or several parts of plants, only if this part or parts can be used for regeneration of this variety. The new improved variety will have the

name proposed by the applicant and approved by the State Commission on Testing of Varieties of Agricultural Crops of the Ministry of Agriculture of the Republic of Tajikistan (Article 24). The patentee and farmers are obliged to maintain the variety during the patent term in such conditions that ensure conservation of features indicated in their description, and in addition they should send seed material for control testing on the request of the State Commission and provide opportunities for on-site inspection.

In Tajikistan, the provisions established in Article 16 on breeders' rights and Article 17 of the Law No. 672 of 29 December 2010 in relation to exceptions to breeders' rights¹, establish specific restrictions in relation to the exchange of improved varieties among farmers, as well as restrictions on farmers in the use of improved varieties.

In practice, the protection of plant breeders' rights is virtually nonexistent, which somewhat inhibits the introduction of new varieties by foreign plant breeders and allows farmers to grow both protected and unprotected varieties without payment of breeder royalties.

The next step in achieving equitable benefit sharing from the use of plant genetic resources is a well-established and functioning system of variety testing, including a test of varieties for "perfectness and stability" and economically valuable traits.

Freedom of choice of crops or varieties for cultivation

Freedom of choice of crops or varieties for cultivation is available. Thus, in conformity with the 2009 *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises*, farm facilities can independently define the production structure in view of their interests and can be engaged in any kind of activity not forbidden under the legislation of the Republic of Tajikistan.

In accordance with the Law each farmer is entitled to:

- autonomously manage the land, including making independent choices of crops to be produced;

1 Article 16. The breeder's right: 1. The following acts in respect of the propagating material of the protected variety shall require the authorization of the breeder:

- production or reproduction (multiplication);
- conditioning for the purpose of propagation;
- offering for sale;
- selling or other marketing;
- exporting;
- importing; and
- stocking for any of the purposes mentioned above.

Article 17. Exceptions to the breeder's right: 1. The breeder's right shall not extend to:

- acts done privately and for non-commercial purposes;
- acts done for experimental purposes; and
- acts done for the purpose of breeding other varieties, and, except where the provisions of Article 16(4) to (6) of this Law apply, acts referred to in Article 16 (1) to (3) in respect of such other varieties.

- cultivate his/her own varieties; and
- exercise other rights consistent with the law.

However, *dekhkan* enterprises that independently grow cotton enjoy additional privileges. In accordance with Article 35 of the law, they are exempt from payment for connecting of electro-energy facilities and water supply. Therefore, in practice, freedom of choice of varieties to plant is limited.

Access to land

In accordance with Article 10 of the *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises*, the land area for creation of farm facilities is given for life and inherited on the basis of the application made to the local agency of the government of the area (city). At the same time, this article also gives the right use of farm facilities on the basis of an additional lease of the land area for industrial purposes. The land area is allocated, as a rule, with a standard clause. Article 11 of this Law provides the norms for the granting of land areas to the creation of farm facilities. Among them:

- a. for the lands of agricultural organizations, at the normal rate of an average land share, each member of the organization has right to the land;
- b. on lands of special reserves, at the average rate of a district (city) land share, any of the able-bodied members has the right to organize farm facilities.

The Law stipulates the process for establishing a special land fund for the creation of farm facilities. Thus for the organization of farm facilities, the local agency of the government of an area (city) creates the special land fund that integrates:

- the lands transferred to a category of less valuable lands;
- the land reserves;
- the lands of all categories that have not been given special-purpose designation;
- the lands which were allocated for agricultural production and have not been used by the end of one year, and also those allocated for non-agricultural purposes and not used within two years;
- the lands which have not been covered by forests or bush, and are suitable for use in agricultural production;
- the lands of agricultural organizations that are not used effectively;
- the lands of farm facilities which have stopped their activity; and
- re-development lands.

The identified land areas included in special land reserves, following the decision of local agencies of the government of area (cities), are removed from the creation of farm facilities.

In accordance with the *Land Code* adopted in 1996, a certificate to land use ascertains a right to use the land. The certificate is issued in the name of the head of a *dekhkan* farm pursuant to procedures established by the Government of the Republic of

Tajikistan. Land use is only possible upon availability of the certificate. An agreement between the parties attests to the right to land lease.

A *dekhkan* enterprise shall be registered with local tax authorities in the vicinity of the enterprise and simultaneously with state statistics agencies after receiving a certificate for land use according to the legislation of the Republic of Tajikistan. Each *dekhkan* enterprise shall be registered in an economic activity registry of a village, specifying its key performance indicators. A certificate for land use, duly issued to a *dekhkan* farm in line with regulations of the Republic of Tajikistan, ascertains the rights to land use as follows:

1. land use is only possible after receipt of a certificate for land use;
2. each member of a *dekhkan* farm is issued a certificate to a land share – a document that provides for the size of a plot of land share for each member of a *dekhkan* farm individually; and
3. a right to land lease is entitled based on the agreement of parties concerned.

The legislation stipulates the following procedure for allotting land plots from special land reserves for the establishment of a *dekhkan* farm: citizens who have expressed their intention to start a *dekhkan* farm, including those who have moved from other districts for permanent residence, shall file an application with relevant rationale for a land plot to the executive authority of the local district (municipality) where the land plot is located. The application shall indicate the purpose of the land plot in question, the approximate size and location, and the total number of employable members. The local district executive authority shall, within one month after filing the application, make a decision on the allocation of the land plot. In the case of non-observance of the consideration period or in the case of concealing information about the existence of the special land reserve, officials found responsible shall be held liable in accordance with the legislation of the Republic of Tajikistan. The appeal against the decision of the local authority will be decided in court.

In addition, the legislation provides for the procedure of establishing a *dekhkan* farm on the lands of state seed production facilities, fruit nurseries, stud farms, research institutions, scientific and production and educational experimental facilities and vocational and technical schools as well as on lands of the state water reserve, which shall be allowed with the sanction of the Republic of Tajikistan.

State economic and technical support

In accordance with the *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises*, expenses for drawing up of the cadastral documentation of the land and agrochemical and ecological research on the land are paid from corresponding budgetary funds. In addition, the land user can independently order and finance the specified works. Also, for the organization of farm facilities in territories where there are no works of industrial and social purpose, the state bears the primary expenses

for construction of roads, electric mains, water delivery, installation of telephones and land reclamation.

The Law provides for the state social insurance and social security of members of farm facilities. Insurance payments are paid from earnings of members of farm facilities. The actual expenses of the farm enterprise related to the development of the farm are excluded from incomes. The member of a farm facility has the right to a pension according to laws of the Republic of Tajikistan. Thus, in general terms, the seniority of farm staff who have operated over time in the farm facility is stipulated. The member of a farm facility with a confirmed invalidity is provided with an allowance and other privileges stipulated by the legislation of the Republic of Tajikistan. The period of work in a farm facility by members of the facility and other citizens who have concluded agreements for employment, is stipulated in terms of an uninterrupted length of service on the basis of records in work-record cards and in documents confirming payment of social insurance.

The legislation stipulates the following privileges:

- a. state registration of farm facilities is free in nature and payment is not required for registration;
- b. by means of conditions stipulated by the Government, farm members are released from payment for connection of electric power capacities, water supply (without the use of construction or technical equipment);
- c. farms can open charge accounts in commercial banks that are free of charges;
- d. farm members can receive soft loans from commercial banks;
- e. farm members can have priority in obtaining government orders; and
- f. in accordance with the means stipulated for support of small businesses, farm members can avail themselves of the possibility of improving their professional skills through training programmes.

The State may delegate certain powers in favor of local authorities in the area of conservation and sustainable use of genetic resources of cultivated plants and their wild relatives within *dekhkan* enterprises and in areas of natural habitats of these plants; in this case local authorities are provided with in-kind and financial resources necessary for exercising such authority. The mandate of local governments in the area of conservation and sustainable use of genetic resources of cultivated plants and their wild relatives includes:

- contribute to state control over the collection, conservation, release, and use of plant genetic resources;
- facilitate and take a direct part in state monitoring of the status of agricultural biodiversity and the documentation of the extent of genetic erosion; and
- provide the public with all possible assistance and support in implementing measures aimed at conservation of local plant diversity and sustainable use for food production and rural economic activity.

Legal support

In accordance with the *Law of the Republic of Tajikistan On Advocacy* (No. 111 of 4 November 1995) a natural or legal person can not be left without legal assistance. The State guarantees the effective and equal access to legal aid for all foreign nationals residing in or having a location on its territory. The State shall establish in law cases where legal assistance should be provided free of charge. The State shall guarantee the necessary financial support to insolvent citizens to provide legal assistance, as well as to pay for legal assistance in accordance with the law, beyond the contract signed with the client.

Right to participate in decision-making

National legislation does not contain provisions in this area. Laws related to Farmers' Associations in the Republic of Tajikistan have not been promulgated; these associations work on the basis of the charter registered in the Ministry of Justice.

Right to dispose the results of farmers' work

In accordance with Article 17 of the *Law of the Republic of Tajikistan On Dekhkan (Farming) Enterprises*, farm facilities and their members have the right to self-manage their place in the economy. Also in accordance with Article 5 of the Act, farm facilities, along with commercial entities and individual entrepreneurs, are equal elements of the economic system. Farm facilities determine the structure and mode of production based on their interests and may engage in any activity not prohibited by the legislation of the Republic of Tajikistan. Intervention in economic activities of subsidiary farming plots on the part of state bodies and official persons is not provided, except for exceptions as stipulated by legislation.

In addition, a *dekhkan* farm is entitled to:

- independently manage the land, including making autonomous choices of which agricultural crops to be produced;
- be the owner of produced goods and receive income from their sale; and
- duly use mineral deposits (sand, gravel, clay, rocks, water sources) and other useful properties of a *dekhkan* farm in line with the procedures established in the legislation of the Republic of Tajikistan.

Traditional knowledge protection

Such legislation has not been established in Tajikistan.

Conclusions

The reforms in the agrarian sector are being implemented not fully in accordance with the adopted decisions, and sometimes in an undemocratic and non-transparent

way. Many labourers and rural populations who have worked on old collective farms (*kolkhoz* and *sovkhozes*) do not have access to information on the processes of reforms in agriculture.

Thus, for intensification of agricultural production and improvement of the economic situation in the country, there is a large potential in terms of lands and labor resources. The enhancement of the sector is impossible without material incentives for agricultural producers. Therefore, the general crop productivity of cotton and other agricultural crops remains low and the coefficient of effective land use is still not high. There is a range of constraint factors in this process; the following can be enumerated as key factors:

- a large part of the irrigated land is still under use of collective farm enterprises, which have an impaired material and technical base;
- some of the debts of the old farm enterprises are imposed on the newly-established *dekhkan* enterprises;
- there is a lack of knowledge on the part of farmers, land tenants and rural populations about their rights and privileges, best practices, market economy and technical advances;
- there is a lack of necessary assets, materials, microcredit, properties and resources for increasing productivity; and
- there is an absence of informative/consultative centers.

The *Law On Dekhkan (Farming) Enterprises* indicates that *dekhkan* enterprises should be independent in their production activities and they should rationally use land resources to increase production and enrich the market.

However, the content of this Law does not correspond to what happens in the field. For instance, the *dekhkan* enterprises are required to cultivate mainly cotton and they are ordered to make contracts with defined investors and instructed at which cotton processing plant they should process the produced cotton raw materials. Under these conditions, *dekhkan* enterprises cannot produce high yields of cotton in the future. It should be noted that, due to cotton monoculture, in many *dekhkan* farms lands are considerably exhausted and cotton is vulnerable to many diseases.

Unfortunately, society does not pay enough attention to fair distribution of benefits between investors and cotton producers. Local authorities do not pay attention to this issue.

In many cotton-producing regions of the Republic, farmers do not know their rights and therefore they receive small benefits. All these factors negatively influence the intensification of agriculture, the transition to free markets, the processes of economic transformation, the improvement of the wellbeing of the population and the decreasing poverty level in the country. In this sense, joint initiatives of the population, local government and communities are required.

Recommendations

For effective implementation of legal provisions and the *dekhkan* enterprises major production rates, it is necessary to develop a special state programme for increasing knowledge of *dekhkan* farmers, the producers of agricultural products, on the issues of local planning, marketing, agroservice, rational use of microcredits, fundraising, development of effective business plans and others. These initiatives are implemented in the country by many donor organizations and international programmes. However, these efforts are not interrelated and not coordinated. The Coordination Committee of Non-governmental Organizations of the Republic under the Union of Dehkhan (Farm) Enterprises and Entrepreneurs (UDEE), organized in April 2004 with the aim of coordinating such activities, is functioning very poorly and requires support.

Due to the absence of an effective coordination centre in the Republic, in some regions many training workshops are organized, while in other districts they are absent. Therefore, there is a need for national level coordination of activities in different training programmes of the agrarian sector of the Republic, which would increase effectiveness of these activities. It is recommended to organize such a center under UDEE of the Republic of Tajikistan.

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FARMERS' RIGHTS IN TURKMENISTAN

Kamakhina Galina

Introduction

Traditional varieties and wild relatives of 172 cultivated species of plants, or 69% of the total quantity plant species in the Central Asian center of origin, have been maintained in Turkmenistan on farms (*in situ/on farm*). The territory of Turkmenistan is one of the primary centers of origin for a number of the most important food crops. Wild species of melon, pumpkin and watermelon, onions (65 species), grain-legumes (chick-pea, lentil, vetch, mungbean and cereals (rye, barley, millet, oats) provide the initial material for breeding efforts. Many forest species (Turkmen subspecies of Sievers apple, species of pear, sour cherry, plum, fig, almond, pistachio, ashberry, hawthorn, barberry, pomegranate, walnut, grape and others, altogether 40 kinds of species) form the genepool of wild relatives of fruit crops adapted to the local conditions. The presence of many endemic species of wild relatives of cultivated plants peculiar only to the Kopetdag and neighboring Khorasan, Koytendag and Badkhiz emphasizes the high global significance of this prime center of genetic diversity of plants in the crops domestication. The traditional knowledge of the local people on horticulture, melons production, rainfed and irrigated agriculture has been maintained for centuries and passed, as a rule from parent to child or from teacher to student.

The cultural originality of the diversity of agricultural crops on farms in Turkmenistan is primarily revealed in the conservation and development of traditional knowledge related to support of the traditional agriculture of the Turkmen people, as this knowledge has originated and been used in the specific cultural sphere with its own internal rules and ethnic norms. Traditional knowledge has remained a constituted element of intellectual wealth of the Turkmen culture. Thus traditional forms of the Turkmen apple (Turush, Okcha, Yuvan, Kizilcha, and other varieties) have been cultivated here from the fifth and fourth centuries BC. Wild relatives of cultivated varieties of grapes descended from the wild *Vitis sylvestris*, are still seen in wild form in the mountains of the southwestern Kopetdag, where it has grow since the Parthian reign. It should be noted that the local varieties of seedless grape, which have resistance to high temperatures, are important also for the excellence of their good taste and trade quality. Today old varieties of pomegranate such as Parfyanka, Turan, Molla Nepes, Sumbar, Nissa, Messarian and Myatadji are still maintained in farmers' orchards.

Social and economic conditions have determined the leading place of agriculture in the national economy of Turkmenistan. The agricultural biodiversity of Turkmenistan is a component of the country's traditional way of life and its national culture. Farmers (*daykhans*), as part of the original economic culture of the country, and operating under traditional rules and ethnic norms, are directly engaged in the *in situ* conservation of agricultural biodiversity. Conservation of the national biodiversity and natural resources in the local market, prevention use of genetic engineering on them to produce GMOs (genetically modified organisms) and the solution to the problems of access to the genetic resources and to benefit-sharing are all of strategic importance for Turkmenistan.

In the agronomic sector of the country, the state has taken on the task of rapid development of horticulture and viticulture. Horticulture development in rural areas has been accelerated as an integral part of the social and economic development of villages.

Quite a number of normative and legal acts of both general and specific character have been promulgated and are in force in the area of protection of farmers' (*daykhan*) rights. In particular, the *Constitution of Turkmenistan* (1992), with amendments (2008), and the following national laws: *On Property* (1993), *Civil Code of Turkmenistan* (1997), *On Rent and Rent Relations* and others belong to the legal acts of general character. Laws such as *Daykhan (Farming) Enterprises* (2007), *On Daykhan (Farmers) Associations* (2007) as well as the *Water Code* (2004), *Land Code* (2004) and *Forest Code* (2011), belong to the category of specific normative and legal acts regulating issues regarding the protection of farmers' (*daykhan*) rights in their farming activities. Amendments were made to the *Land Code of Turkmenistan* which is now in force in accordance with the *Law On Modifications and Amendments to Some Legislative Acts of Turkmenistan* (2007). Henceforth land plots are leased for construction and other non-agricultural needs for the duration of 40 years.

Access to land

Current laws on the development of the agrarian sector are directed mainly to support of programmes for de-nationalization and privatization of state property, i.e. reorganization of big collective farms. Within the framework of the *State Programme "New Village"* (2001), tenants and private persons were granted the use of approximately 83% (1,500,000 ha) of irrigated lands as owned property or on long-term lease. Lands are given to citizens for use and lease mainly on a 5-6 year basis. The tenant (farmer) becomes the user of the land plot and the plant genetic resources growing on it.

The main location of wild relatives of fruit crops and grape is the Forest State Reserve and the forests of the specially protected natural areas. Limitations have been set for the use of water for land irrigation, other industrial and public utility uses due to the deficit of water resources. The *Law On Allocation of Land Ownership to Citizens*

for *Farm-Market Agriculture* (1996) became a starting-point for farm development. The normative and legal regime was established with the aim of encouraging the development of a market infrastructure in rural areas. On his farm, a farmer has the legal right to cultivate local varieties and wild relatives of fruit and other crops, the right to his own products and to obtain income to use at his discretion without being subject to tax. There are additional exemptions (financial loans are available from banks) to free communal services for development of private farms but, unfortunately, investments for new orchard establishment and the maintenance of nurseries are lacking. Traditional knowledge and farmers' practices were considered only indirectly during the development of national legislation and do not shed light on the problem of farmers' rights to use genetic resources and to obtain benefits from them while leasing land. For this reason, the current legislative acts do not always adequately establish links between agricultural practices and the conservation and sustainable use of components of biodiversity — in particular, fruit crops and their wild relatives.

Access to seeds and reproductive material

Different laws as *On Seeds* (1996), *On Seeds Production* (2010), *On Legal Protection of New Varieties of Plants* (2011) have been enacted in the field of intellectual property, and seed commercialization where the rights of farmer-innovators to apply for patents for growing fruit varieties with the use of genetic resources of wild relatives has not been stipulated. The protection of the rights of farmers engaged in growing local varieties of fruit crops and their wild relatives is also absent. A new *Law On Intellectual Property and Related Rights* (2012) regulates only the relations connected with works of science, literature and art, and do not include the issue of farmers' rights. Concrete legal measures on the conservation of genetic diversity of all agricultural crops, including local varieties (except wheat and cotton) are also absent.

The problem of regulation of property and non-property rights as well as legal relations arising in the sphere of the establishment of legal defense and use of new patented varieties of plants, was partially established in the new *Law On Seeds Production* (2010). This law set the legal basis for production, storage, processing, conservation, realization and transportation activities as well as the use of plant seeds and the organization and functioning of the seed-production system. Patent owners as well as juridical and physical persons implementing their seed-production activities with appropriate licenses, have the right to the production and use of varieties and hybrid seeds. Without a license, the seeds can be produced only for personal needs.

Local bodies of the executive authority and local self-government (*daykhan* association), on the one hand have the right to assist in the establishment and development of self-saved seed production and the conservation and effective use of valuable local genetic resources. On the other hand, however, seeds of varieties created by local farmers from genetic resources of wild origin are not included in the State Seed Register of the country.

The *Law On Seed Production* states that “Juridical and physical persons have the right to produce seeds without license only for personal needs”. According to this law, local bodies of the executive authority and local self-management have the right to assist in the “establishment and development of the farmers’ own system of seed-production, conservation and effective use of valuable local and global genetic resources”.

Seeds intended for release are required to have appropriate certification confirming their varietal makeup, and at the same time the procedure of certification of seeds of those varieties created from wild relatives is not defined. The new law also allows certifying seeds of forest and medical plants. However, the law does not consider the issue of farmers’ rights for crop varieties developed by them. Seeds of the wild relatives of fruit crops, seeds of domesticated forms of the wild species or traditional “old” varieties from local breeding were not included in the State Register of Seeds, or kept by the Patent Agency of the Ministry of Economy and Finance in accordance with the *Law On Seed Production* (2010) and the new *Law On Legal Protection of New Varieties of Plants* (2011). The breeding achievements that result from the work of generations of farmers do not come under the main criteria of innovation, that is why appropriate patents are never issued to the farmer by the Patent Agency of the Ministry of Economy and Finance, the main authorized body in the field of intellectual property.

The legal regime of the new *Law On Legal Protection of New Varieties of Plants* (2011) does not consider the problem of farmers’ access to seeds and planting material at all. For this reason, issues regarding the provision of protection of plant genetic resources and their wild relatives and realization of benefits from their use should also be considered in the new *Forest Code* (2011). Forests and wooded areas are the sites where wild relatives of fruit crops grow and the sources of seed and planting material. For this reason, the protection of traditional knowledge, innovation and practice, provision of rights of access to the forest genetic resources (including rules of collection, regulation of benefit-sharing and cooperation principles) are of high importance for the development of breeding work on fruit crops and in viticulture.

Farmers’ intellectual property rights

Theoretically it could be supposed that small farmers growing fruit crops are permitted to declare their rights of intellectual property on their varieties in accordance with the new *Law On Seed Production* (2010). However, there are legal and practical limitations which do not allow the farmer to protect his right of his own varieties. The reasons for this are varied. In particular, the process obtaining intellectual property rights on created varieties is very difficult and demands cash expenditures from farmers which they are not able to provide. In addition, varieties grown by farmers cannot correspond to the demands of legislation on distinction, homogeneity and resistance of the variety.

The new *Law On Legal Protection of New Varieties of Plants* (2011) does not provide for legal protection of the variety bred using the genetic resources of wild fruit species or for protection of traditional varieties. The law provides for legal protection of the breeding achievements of scientific research organizations and individual breeders through patent issue for the created plants variety if a new variety corresponds to the appropriate list of criteria. However, the new law does not raise the issue of defense of farmers' rights to their breeding achievements and does not consider the measures on rendering support to farms that maintain the genetic diversity of local varieties of fruit crops and their wild relatives.

Traditional knowledge protection

Unfortunately, in the new laws that have come into force on seed production and breeding achievements are mainly directed to the conditions of improvement for functioning private farm (*daykhan*) enterprises, the specific articles on regulation of the intellectual property of traditional knowledge on plant genetic resources are absent. This issue was also ignored in the new *Law On Intellectual Property and Related Rights* (2012). Meanwhile, traditional knowledge on plant genetic resources should be the subject of regulation in the field of intellectual property rights. In this case, new cultivars created from local knowledge on traits and properties and as the source of germplasm for breeding and conservation.

For this reason the issue of protection of traditional knowledge of indigenous and local communities has remained non-codified on the level of farms. In this situation, it is desirable to institute the register of farmers' varieties in accordance with a new specially developed criteria. This would allow the maintenance of old local varieties of fruit crops and grapevine, the value of which is their natural local origin and specific characteristics.

The issue of protecting traditional knowledge of indigenous people was also not reflected, the right of community to their plant genetic material was not recognized, nor was the value of genetic characteristics of forest resources noted in the new *Forest Code* (2011). Regulation of rights to and control over the use of genetic resources was also not considered, nor was the priority of protecting 16 of the most valuable forest tree species. The issue of sustainable use of forest resources should be considered along with the issue of protecting traditional knowledge of local communities. This would involve, in particular developing mechanisms for ensuring access to forest genetic resources and benefit-sharing. It is necessary to develop standards for raw planting material, including regulations of where, when and how or in which ways harvesting can be carried out. Development of rules on benefit sharing and cooperation principles allows the definition of minimal needs in this sphere.

In the *Forest Code* the legal regulation of traditional knowledge was not defined and differences between rights to plant genetic resources when they belong to the state and rights to traditional knowledge on the part of local and indigenous holders of

such knowledge (farmers), were not taken into account. The law permits protection of intellectual property rights in the realization of agreements on access to plant genetic resources and joint use of derived benefits. The system for the protection of forest genetic resources of Turkmenistan available in the Forest Code is still in its infancy stage and thus does not yet sufficiently reflect the international obligations on the conservation of plant genetic resources to which Turkmenistan is signatory.

Conclusions

An analytic view of current national legislation has exposed the need for further development of legal support to farmers engaged in growing local varieties of fruit crops and grapevine. Recognition of farmers' rights, particularly with regard to the use of local material and wild relatives of cultivated fruit crops to create new varieties, has led to consider the need for the improvement of legal conditions for *in situ*/on farm conservation of local varieties of fruit crops and their wild relatives. Legal support is necessary for the development of farms but financial subsidies of the government are needed to enable farmers to make decisions regarding the conservation of genetic diversity of the traditional local varieties of fruit crops that would allow them to strengthen their market participation and assist them in conserving local varieties. Legal support to farmers will be aimed at the conservation of country's plant genetic resources both in their natural habitat (*in situ*) and *ex situ*.

Relying solely on existing legal tools of national legislation, it is difficult to provide adequate protection to intellectual property rights for breeding achievements, to provide farmers' rights to plant genetic resources and to ensure benefits to Turkmenistan from the use of these genetic resources abroad.

The analysis of national policy and legislation exposed some gaps that limit the possibility of conservation of local varieties of fruit crops and crop wild relatives through farmers' efforts. This is first of all connected with the lack of legislation with regard to farmers' rights, farmers' associations and cooperation between farmers and scientists due to the lack of economic incentives. In addition, a weak level of knowledge on the part of the population and decision-makers about farmers' rights is directly correlated with weak expertise in the area of fruit and grape crops. It is thus very important for the country to have a well-defined normative and legal basis on which farmers' rights and development of organizational and legal forms of rural economic activities can be strengthened. At present the refinement of current legislative acts also allows the country to make important strides in the conservation of agricultural biodiversity, rare varieties of fruit crops and their wild relatives. In the future it will help farmers using traditional knowledge to engage in agriculture linked with the maintenance of local varieties of fruit crops and their wild relatives *in situ*.

The development of markets in the country has not given farmers economic incentives to cultivate on his/her farm traditional and less "tradable" varieties of current productive

crops. Therefore financial subsidies from the state would strengthen the incentives for farmers to grow traditional local varieties. In addition, legal protection of the potential, popularization and reintroduction on farms of rare and wild plants will encourage their conservation for further breeding of new varieties, which would reduce the threat of loss of these national natural genetic resources. Further development of national legislation on farmers' rights will contribute to efforts to legalize the right of farmer associations to participate in the conservation and sustainable use of genetic resources of fruit crops, including their wild relatives, on protected and forest areas. The successful introduction of national legislative acts with regard to farmers' rights responds to current realities and achieves the conformity of national legislation to international accords on the regulation of access to genetic resources and the equitable sharing of benefits derived from their use.

Recommendations

The legal concept *On Application and Use of Farmers' Rights of Turkmenistan for Elimination of Gaps Existing in The New Draft Laws* was prepared within the framework of the regional UNEP-GEF project "In situ/on farm Conservation and Use of Agrobiodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia" coordinated by Bioversity International. This legal initiative places the genetic resources of fruit crops under the general concept of biodiversity that considers farmers' rights as expressed in international conventions. Farmers' rights are based on their traditional knowledge, which comprises farmers' experience and the knowledge of their ancestors with regard to the cultivation of traditional varieties of fruit crops and to their wild relatives. This knowledge has been transmitted from one generation to another over thousands of years. Farmer's rights include the protection of this traditional knowledge and their own innovations and practices, as well as, the equitable sharing of benefits derived from this traditional knowledge and equitable access to plant genetic resources for food production and agriculture.

A detailed elaboration of farmers' rights was reflected in the draft national legislative act *On Farmers' Rights, Measures on Support of Farms and Benefit-sharing Mechanisms in the Cultivation of Fruit Crops and Their Wild Relatives in Turkmenistan* which was also developed within the project. This public initiative is directed to the issue on farmers' rights which include legalization of the right of farmers participation in conservation and sustainable use of wild relatives of fruit crops on protected and forest areas. Farmers' rights also depend upon the establishment of legal norms of protection of forest genetic resources of wild relatives of fruit crops giving attention to their conservation, protection and regeneration.

The development of a legislative regime for the protection of farmers' intellectual property rights with regard to breeding achievements provides farmers with access to genetic resources and to equitable sharing of benefits from their use, including legal protection of traditional knowledge.

It is of prime importance to consider farmers' rights when it comes to equitable sharing of benefits, including the recognition of farmers' rights to the use of varieties created with use of wild relatives and cultivated varieties of fruit crops in conservation of genetic resources of fruit crops. Within the framework of the project, model agreements and guidelines were developed on access and benefit sharing between partners, which contributes to encouraging market participation and enhancing the introduction of local varieties in markets.

Farmers' rights for education and training will also contribute to the activation of farmers' communities as well as giving farmer-innovators the right to apply for patents on fruit varieties they created with the use of wild relatives. This leads to encouragement of investments in breeding efforts and elite seed production in Turkmenistan and is crucial for the improvement of the breeding process. Thus the first step in the realization of the rights of indigenous populations over their traditional knowledge should be the classification and inventory of this knowledge. The second step should be the preparation of supporting documents for juridical registration. Regulatory mechanisms for farmers' rights will rely on the balance between international obligations and national rights over plant resources.

Within the framework of the regional project, training modules such as the one headed "*Increase of the level of legal awareness of Turkmen farmers on cultivation of fruit crops and their wild relatives*" were developed to increase public awareness. This allowed farmers to appreciate the national cultural heritage of traditional varieties as strategically important components of the food security and safety of the country.

One of the means for ensuring the conservation of farmers' agricultural biodiversity is the right to apply for a patent on breeding achievements created through use of traditional knowledge of local communities. The work of scientific and research institutions of the country and individual breeders and farmers on the improvement of economically useful traits of cultivated fruit crops through the use of wild relatives and traditional varieties, allows the establishment of the legal rights of innovators over these achievements, together with all relevant moral and material privileges. The farmer-applicant's right to apply for a patent is based on a *Prior Informed Consent* (PIC) from the local community and should be stipulated in the legal document *Regulation of intellectual property for breeding achievements*, where his/her right to the breeding achievement would be stated in a separate article. The promulgated *Law On Protection of Farmers' Rights, Measures for Support to Farm Enterprises and Benefit-sharing Mechanisms Arising From the Cultivation of Fruit Crops and Their Wild Relatives in Turkmenistan* leads to strengthening of discussions of farmers' rights and separate regulations on intellectual property rights.

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FARMERS' RIGHTS IN UZBEKISTAN

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Introduction

The existing national legislation on protection of farmers' rights was analyzed under the UNEP-GEF Project "*In situ/on farm Conservation and Use of Agro-biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia*" coordinated by Bioversity International.

In recent years, the country has been engaged in extensively developing its farming sector. The country has adopted a series of laws governing protection of farmers' rights in the area of creation of *dekhkan* and farming enterprises. Laws have been adopted to protect farmers' interests, including their intellectual property — namely, the crop varieties resulting from breeding efforts. These laws include the laws *On Breeding Achievements* and *On Seed Production*.

The *Law No. 395 On Breeding Achievements* was approved on 29 August 2002. The purpose of the law is to regulate relations in the area of the creation, legal protection and use of breeding achievements. A new plant variety is considered a breeding achievement in the field of plant breeding. The *Law On Breeding Achievements* defines a variety as "a group of plants ascertained by properties that are persistently inherited, which characterize the given genotype or a combination of genotypes and are different from other groups of plants of the same botanical taxon by one or more properties." Protected categories of a variety include a clone, a line, a hybrid of the first generation, and a population.

Uzbekistan has put in place the institutional framework of legal protection of breeding achievements. There are patent offices, which accept and consider applications for patents for breeding achievements. The agency offers expertise, keeps the *State Register of Plant Varieties* and issues patents. The State Commission for Variety Testing of Agricultural Crops within the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan examines patentability of the claimed breeding achievements.

Project activities include the participation of farmers in joint research projects. In this regard, the most promising is joint participation in breeding programs, where farmers can co-author new varieties. In this case, the farmer has a right to be mentioned in the application for a patent, the patent itself and in all publications relating to the breeding achievement.

For the purposes of research in partnership with farmers, especially with the view of creating new fruit crop varieties, it is recommended that an agreement is generated and signed before the commencement of any work that reflects interactions between the farmer and a research organization. It should be agreed beforehand who will be a patent holder and how remunerations will be allocated.

Access to genetic resources

Plant genetic diversity is under threat of “genetic erosion” - a term created by scholars to refer to the loss of individual genes and combinations of genes, such as those available in varieties that have adapted to local conditions. According to the FAO document *Status of Global Plant Genetic Resources for Food and Agriculture*, the main reason for genetic erosion is the replacement of local varieties with modern ones. Because old varieties in farmers’ fields are replaced with new varieties, genetic erosion frequently occurs because not all genes that are present in the varieties grown by farmers are contained in the new varieties. In addition, the number of varieties is often reduced when commercial varieties are introduced into traditional farming systems. Other causes of genetic erosion include the emergence of new pests, weeds and diseases, environmental degradation, urbanization and land clearing due to deforestation and forest fires.

Traditional efforts to combat genetic erosion mainly consisted of seed conservation in genebanks of agricultural crops (*ex situ*). Presently, it has become clear that the best strategy combines *ex situ* conservation and *in situ* preservation (on farm) by farmers in their agricultural ecosystems, and conservation of wild relatives of agricultural crops, for example, in areas protected for their ecological value. These methods of plant genetic diversity conservation are vital, but sustainable use of plant genetic resources is equally important. Genetic diversity of plants expands choice and provides protection against future adverse conditions such as extreme and volatile environments. However, there should be room for variety enhancement through plant breeding to use this potential and there is a need for establishing partnerships and systems involving all stakeholders from farmers to researchers and managers of genebanks.

Legislation provides no limits for access of farmers to genetic resources. Access of farmers to genetic resources depends on their financial capacities. Every farmer is interested in generating profit, so he can choose nurseries, markets, and *dekhkan* farmers, which offer necessary seedlings, seeds, or other genetic material at a reasonable price. A farmer is not prohibited from conserving, propagating, and exchanging plant genetic resources (seed stock). The main thing in this issue is tangible or financial support for farmers from the government to conserve the reproduction material. No such mechanism currently exists.

The Republic of Uzbekistan ratified the *Convention on Biological Diversity* in 1995. Article 19 of the Convention states that each Contracting Party shall take legislative, administrative or policy measures to ensure effective participation in biotechnological

research of those Contracting Parties, especially developing countries, which provide genetic resources for such research.

According to the *Law of the Republic of Uzbekistan On Breeding Achievements*, dated 30 August 1996, and in the new edition of this Law, dated 29 August 2002, a breeder's right holder has the exclusive right to use breeding achievement at his own discretion. The availability of species of crop wild relatives as well as any cultivated plants bred (grown) through plant breeding allows to continue innovation.

Protected varieties may be subject to a license agreement. Any legal person other than the owner is entitled to use the selection achievement, protected by a plant breeder's right, only with the permission of the right holder on the basis of a license agreement.

The breeder's right holder may apply for public/open license to the Patent Office to assign to any person the right to use the breeding achievement. In this case, the breeder's right fee for maintaining the exclusive right is reduced by 50%. A request by the breeder's right holder to assign the right to use the breeding achievement under the public/open license cannot be revoked. Anyone wishing to buy the public/open license is obliged to sign the agreement with the breeder's right holder.

The breeder's right holder may transfer the right to use the breeding achievement by providing an exclusive or non-exclusive (simple) license. In an exclusive license the licensee obtains the exclusive right to use breeding achievements within the limits specified by the license contract, with the reservation that the licensor of the right to use the breeding achievement of the part is not transmitted by the licensee. When, through a non-exclusive (simple) license, the licensee gives the licensor the right to use the breeding achievement, all rights are reserved under the breeder's right, including the granting of license to another person.

If the breeder's right holder does not use the breeding achievement within the Republic of Uzbekistan for a period of three years from the date of issuance of a breeder's right and refuses to enter into a licensing agreement, and if the non-utilization of this breeding achievement affects the national interests, a person wishing to use the breeding achievement, may apply to the court and request a compulsory license. A compulsory license is granted in the form of a non-exclusive (simple) license and gives the right to receive from the patent holder an initial source of seed, planting or pedigree material. A compulsory license is issued only to a person who can ensure the use of the breeding achievement in an acceptable manner and in accordance with the license. The compulsory license does not prevent the breeder's right holder from using the protected breeding achievements or assigning license on their use to another person.

Breeding achievements are recognized as used if produced, reproduced, brought to varietal or pedigree condition or deployed as seed, planting or pedigree material if its

morphological, physiological and other characteristics correspond with the information contained in the official description of the protected breeding achievements.

Juridical entities and individuals of the Republic of Uzbekistan are eligible for granting the rights on new varieties of plants in other countries in accordance with the law. Foreign juridical entities and individuals within the the *Law On Breeding Achievements of the Republic of Uzbekistan* have the same rights as juridical entities and individuals of Uzbekistan on the principle of reciprocity.

Right to save and exchange reproductive material

A farming enterprise is an independent entity engaged in commercial agricultural production on the basis of a land lease. According to the *Law No. 692-II On Farming Enterprises* of 26 August 2004, a farming enterprise has the right to open bank accounts to conduct monetary transactions and to freely manage these assets. Funds may be deducted from the account of the farming enterprise only upon receiving the consent of the head of the farming enterprise or according to a court decision.

According to the *Law On Farming Enterprises*, a farming enterprise has the right to sign economic contracts with legal and physical persons to sell products, including those for public use. Products manufactured on farms are exported in the manner prescribed by law.

A farmer is not prohibited from conserving, propagating, or exchanging plant genetic resources (seed stock). The main issue is tangible or financial support for farmers from the government to conserve the reproduction material. There is no such mechanism at present; it should be created through the development of special legal and regulatory instruments.

Right to receive benefits arising from use of genetic resources

National legislation has no regulations (legal provisions) on sharing benefits from the use of genetic resources. The main instrument for improving the welfare of the population of the Republic is the *Welfare Improvement Strategy of the Republic of Uzbekistan for 2002-2010* developed by the Government of Uzbekistan and taking into account the recommendations of the World Bank, UNDP and other international organizations. As stated in the document, the level of poverty in Uzbekistan for the period of 2003 stood at 26.2% and the unemployment rate at 3.9%.

According to Article 19 of paragraph 2 of Convention on Biological Diversity “Each Contracting Party shall take all practicable steps to promote and advance priority access on a fair and equitable basis by Contracting Parties, especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties. Such access shall be on mutually agreed terms”.

In recent years, these have become topical issues shaping the market through intellectual property rights in agriculture, and in particular on farms, following the example of New Varieties of Plants.

The relevance of these problems actually resulted from ongoing processes of increasing the role of intellectual property rights in material production and the need to accelerate the involvement of intellectual property concerns in economic transactions.

For example, breeding achievements (in this case it may be seedlings, seeds and other genetic material of varieties of fruit crops and their wild relatives) are considered especially the development of market relations in the breeding and seed production area, the role of legal protection of results of breeding in forming the market of intellectual property objects in agriculture, the level of market development of intellectual property objects in agriculture, valuation of breeding achievements, as well as efficiency of marketing of these products and role of agricultural research organizations in the development and marketing of breeding achievements as conditions of a new civil society.

In order to realize its right to derive benefits from the use of genetic resources, the farms under Article 16 of the *Law On Farming Enterprises*, are entitled to:

- organize production on land allocated in accordance with the relevant sections of the *Constitution* and the lease agreement;
- carry out the deployment of crops with the view of specialization and on the basis of the contracting treaties;
- enter into future contracts with advance payment of purchased goods;
- dispose of what is produced, including the right to sell the produced products to consumers;
- set prices for products, the work performed and services rendered;
- enter into contracts for the supply of electricity, fuel and lubricants, fertilizers, chemical pesticides and the provision of services;
- receive an income (profit) from business in unlimited amounts, subject to taxation in the procedure established by law;
- dispose of the income earned (profit) and cash available in its bank accounts;
- acquire shares and other securities;
- obtain credit to bring to the contract money and other property of other legal and physical persons and use them for the production and reproduction;
- provide collateral for loans to the property, as well as the right to lease land;
- enjoy all the benefits and preferences provided for small and private enterprises;
- acquire, or lease, equipment, capital goods and other property, to carry out construction and renovation of buildings and structures; and
- go to court to defend their rights and legitimate interests.

Access to land

The *Law of the Republic of Uzbekistan On Farming Enterprises* states that the land for farming is granted:

- from the land reserves;
- from agricultural lands that are not already given to juridical entities and individuals; and
- following the reorganization or liquidation of agricultural cooperatives (*shirkats*) and other agricultural enterprises, institutions and organizations.

Land plots provided to farmers from the land of agricultural cooperatives (*shirkats*) and other agricultural enterprises, institutions and organizations should be derived from the balance sheet of these entities. Land belonging to research institutions, universities, academic lyceums, professional colleges and secondary schools, as well as lands of water reserves, cannot be provided to the farmers.

Land plots of land located along the state border of the Republic of Uzbekistan, rivers both large and small, and reservoirs, are available for farming in accordance with the law. It is forbidden to allocate the land plots closer than five hundred meters to the state border of the Republic of Uzbekistan for livestock, poultry and other farm activities related to reproduction, and maintenance of grazing animals (poultry, cattle, and other fur-bearing animals, fish, bees, zoological parks, vivariums, etc.).

In order to allow farming, land is leased on a competitive basis for periods of up to fifty years, but not less than thirty years. For allocation of farm land, priority is given to those living in the area where the farm is being developed.

Plots of land for reserves or agricultural purpose, not owned by legal or physical persons, shall be provided according to the decision of the governor of the area on the basis of a competition conducted by the district commission on land allocation.

Land plots of agricultural cooperatives (*shirkats*) and other agricultural enterprises, institutions and organizations under reorganization or liquidation, are assigned on the basis of the decision of the *khokim* (mayor) according to the results of a competition conducted by a specially constituted commission.

Plots of agricultural cooperatives (*shirkats*) and other agricultural enterprises, institutions and organizations can be given to their members (employees) for farming on the basis of a competition held in a general meeting of agricultural cooperatives, the authorized officials of the other agricultural enterprises, institutions and organizations under the local authorities and the local governor.

Decisions on allocation of land for farming will enter into force after approval by the regional commission on land allocation under the region's governors.

A committee formed by *shirkats* and representatives of other agricultural enterprises, institutions and organizations is in charge of identifying free land to be provided to farmers. The plot is conceded to farmers under a lease agreement signed by the head of the farm and the local governor. In case of land demand being denied by the

local governor, the decision can be appealed before the superior court as well as the regional commissions in charge of reviewing matters of (marketing) of land, which can disapprove the decision of the local governor. For individuals who obtained land for farming and have a dwelling house in a rural area, there is also a homegarden plot.

The boundaries of the farm land are established in kind (on the ground) by the land-planning agency on local budget expense.

Land plots provided for farming are to be used strictly for that purpose. They can not be privatized, and may not be the objects of sale, mortgage, gift, exchange or sublease. The right to lease the land may be granted to farmers in order to obtain mortgage loans. Land given to the farm can be divided in the reorganization of the farm if the newly-formed land is not less than a minimum provided by the law. The size of the land and its boundaries may be changed only with the consent of the heads of farming units. In the case of the death of these heads of farming units, the right to lease the land is transferred by inheritance for the duration of the lease. At the expiration of the land lease contract, the farm is entitled to an extension of the lease agreement for a further term. In the case of the death of the heads of the farm, the right to an extension of a lease agreement for a further term is vested in his heir.

Lease of land may be changed or terminated by agreement of the parties, and in case of the non-consent of the parties, the court. In the event of liquidation of the farm land lease, the contract shall be subject to dissolution in accordance with the law.

State economic and technical support

The legislation has no special stipulation (standards, provisions) indicating the right of a farmer to receive financial and technical assistance from the government when growing plant genetic resources varieties. However, the legislation has broad and general provisions described below that state that the government guarantees observance of rights and protection of legal rights of farmers. The *Law On Farming Enterprises* state that the government guarantees the rights and protection of the legitimate interests of farmers. Public authorities are obliged to promote and strengthen farmers. National and local executive bodies, local authorities in settlements and villages in accordance with the legislation should exercise oversight in the creation of farms in the territory where there are no production facilities and the primary facilities of settlement (roads, power lines and communications, water, gas, telephones, radio, land management, land reclamation) and:

- assist farmers in building production facilities and housing;
- provide, through a system of public services, a variety of seeds and planting materials for crops, as well as organic and mineral fertilizers, and means of protecting crop plants against pests, diseases and weeds;
- assist in the purchase of agricultural machinery, equipment and inventory on a leasing basis;
- assist in the purchase of breeding livestock and poultry and feed;

- create the conditions necessary for the maintenance of livestock farms and zooveterinary care;
- assist in the harvesting and sale of agricultural products grown on farms;
- encourage farmers in the production of products derived from agriculture; and
- provide consulting, information and other services.

On the farms subject to other forms of support provided for by law, there may be development of private enterprise.

Review of the farm (except for the audits of the financial and economic activities) is carried out in accordance with the recognized procedures based only on trust and the rational use of the land in accordance with the lease agreement, particularly in cases of non-contractual obligations under the sale for public use or in case of the existence of violations of land legislation, as well as late payment of a single land tax. Routine checks of financial and economic activities of farms are performed not more often than every four years. Financial and economic activities of the newly established farms are not subject to routine inspection for a period of two years from the date of their state registration.

Farms pay the taxes, levies and other obligatory payments to the State Budget of the Republic of Uzbekistan and the state trust funds in accordance with the law. Farm earnings after payment of taxes, fees and other obligatory payments are available to heads of farming units.

Right to education and capacity building

Farmers are eligible for professional development, both independently and in seminars organized by the association of farmers and other interested organizations.

Legal support

This right is enshrined in the *State Program "Year of Development and Improvement of the Village"*, adopted in 2009. The State Programme gives a special consideration to the improvement of living standards in rural areas, improvement of the legal framework directed to better support of rural people's interests, development of rural cultural life, employment of the rural population, especially young people, increase of population incomes and well-being. The realization of these tasks, apparently, contributes to further improvement of villages' prospects, and to raise rural population livelihoods to new levels. The State program is directed primarily at further enhancement and strengthening the legal and regulatory framework to more deep ensuring rural residents interests.

Right to participate in decision-making

This right is enshrined in the laws *On the Farming Enterprises* and *On Citizens' Self-Government Bodies*. The legislation has no provisions that directly set forth the rights of farmers with regard to their participation in the process of decision making concerning the conservation and use of plant genetic resources.

The above-mentioned and other laws and bylaws provide for the general rights of farmers in the decision-making process concerning the conservation and use of plant genetic resources. For example, the *Law On Citizens' Self-Government Bodies* provides for the right of a chairperson of a citizens' gathering to arrange for the registration of familial and property dispersal of *dekhkan* yards, oversee the use and conservation of land within settlements and villages, propose issues for the consideration of a citizens meeting on regulation of land relations, and others.

Right to the results of farmers' work

According to the *Law of the Republic of Uzbekistan On Farming Enterprises*, farms have the right to enter into management contracts with legal entities and individuals to supply their products (if these imply seedlings, seeds, and other genetic material of species of crop wild relatives), including those for public use. In violation of treaty obligations, the parties have a responsibility under the law or contract. Deliveries of goods, farm products for export are carried out in accordance with the law.

Dekhkan farms and other rural households, are usually located in areas close to or directly in the areas of growth of entities of wild relatives of cultivated plants. Therefore, they consider themselves as owners of entities of wild relatives of cultivated plants, in spite of existing regulations consolidating the right of state ownership to these entities. At the same time, actions on toughening control over implementation of existing legislation and strengthening the protection of state property rights to wild relatives of cultivated plants are fraught with negative consequences. In this regard, in order to ensure the effectiveness of activities regarding the conservation and use of wild relatives of cultivated plants, it is necessary to introduce separate elements of implementation of rights of private (or collective, communal) property at dominant form (state ownership) of property on the wild relatives of cultivated plants.

As analysis shows, these situations should be carefully examined, because without considering the interests of *dekhkan* farms and other rural households, ensuring the effectiveness of the conservation and use of wild relatives of cultivated plants is impossible. In these cases, security administrators are powerless. Actual opportunities to ensure the effectiveness of the conservation and safe use of wild relatives of cultivated plants appear only with the introduction of economically-fair mechanisms and methods of benefits sharing between interested parties.

The implementation of different forms of ownership through sharing benefits from the use of wild relatives of cultivated plants is determined by the dominant form of

ownership. This arises from real situations involving division of entities related to wild relatives of cultivated plants: society, individual society members, production teams, production communities, industry, certain social strata and social groups. The socio-economic effectiveness of the accepted sharing measures in relation to products derived from the wild relatives of cultivated plants mainly depends on the size of the material benefits from their use.

Farmers' intellectual property rights

Protection of farmers' rights cannot be fully considered without an examination of the right to protection of intellectual property on the selection and use of crop varieties, because many farmers are involved in the breeding process of new varieties of fruit crops.

The analysis of the laws *On Breeding Achievements* and *On Seed Production* shows that laws fully support and protect the intellectual property of farmers. There is a framework in Uzbekistan for protection of breeding achievements. There is a patent agency and the State Commission for Variety Testing of Agricultural Crops under the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan. Any farmer who has created a variety may be an author of a breeding achievement. He/she may be a co-author if the breeding achievement involved several persons.

Research conducted under the project showed that the process of forming and updating a local assortment of fruit crops and grapes is still underway. Farmers are mainly involved in analytical breeding. New forms are ascertained or selected by farmers as authors. Project activities included the participation of farmers in joint research. In this regard, the most promising is their cooperation with scientists in breeding programs, where a farmer will be mentioned in the application for a plant breeder's rights, in the breeder's right itself and in all publications related to a breeding achievement. The farmer has the right to obtain an exclusive right for a breeding achievement. In this case, prior to breeding activities, an agreement that reflects the relationship of the farmer with a scientific institution is generated and signed. The agreement also specifies who will be the owner of the right and under what conditions remunerations will be allocated. Plant breeder's rights gives farmers a right to set up a fruit nursery and grow fruit seedlings for sale. In this case, the duties of the farmer include:

- developing and introducing an effective technology for growing fruit seedlings;
- providing the author's description of hybrids and varieties;
- producing seeds with high cultivar and sowing qualities on the basis of agreements with consumers of seeds; and
- generating and publishing seed catalogues periodically.

Seedlings grown in a farmer's nursery shall be subject to certification with an indication of varietal and sowing qualities and the farmer must guarantee their conformity.

In general the *Law On Breeding Achievements* protects the intellectual property of farmers and enables them to work fruitfully on breeding new varieties of fruit crops, regulates relations in the area of creation, legal protection, and use of breeding achievements.

Breeding achievement claims are tested according to methodologies and within dates set by specialized organizations at state variety testing stations, state variety testing plots, and other organizations, a list of which is subject to approval by the Cabinet of Ministers.

The following proposals have been developed under the UNEP-GEF Project "*In situ/* on farm Conservation and Use of Agrobiodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia" coordinated by Bioversity International with regard to the registration of local varieties and varieties bred by farmers in Uzbekistan:

1. it is recommended to test the stated breeding achievement on farmers demonstration plots according to the methodology of State Committee for Variety Testing of Agricultural Crops
2. it is recommended to test varieties in close cooperation with farmers and researchers
3. a breeder's right holder shall maintain the variety during the validity period of the exclusive right in such a way as to preserve properties indicated in the official description of the variety as of the registration date in a relevant registry. This means that there should be parent trees for each variety. It is advisable to plant parent trees on demonstration plots
4. the following procedure is recommended for receiving a plant breeder's right:
 - a breeding achievements is a "variety" bred "selected" by a farmer;
 - handover to fruit crop research institutions to confirm novelty and distinction of the breeding achievement;
 - testing of the breeding achievement by the applicant;
 - submission of the breeding achievement to the State Commission for Variety Testing of Agricultural Crops;
 - expert examination for patentability of the breeding achievement;
 - receipt of a breeder's right;
 - propagation of the breeding achievement (creation of parent trees for the breeding achievement, certification of seedlings); and
 - sale of seedlings.

Traditional knowledge protection

Farm households of the Republic use various traditional practices of maintaining fruit orchards and vineyards, different methods for shaping and pruning trees, different mechanisms for disease and pest control, and various methods of processing and storage of fruits.

Within the framework of the UNEP-GEF project "*In situ/* on farm Conservation and Use of Agrobiodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia,"

coordinated by Bioversity International farmers' achievements in *in situ*/on farm conservation and use of local varieties and forms of target fruit crops and their wild relatives were identified. Almost all socio-economic aspects contribute to determining the potential and willingness of farmers to grow local varieties and seedling materials for supply to the population. Methods used by farmers for managing agricultural biodiversity on farms were carefully studied, including those related to choosing species, varieties and rootstocks, the layout of trees and bushes, carrying out agro-technical activities in orchards and vineyards; pruning and shaping trees and shrubs; pest and disease control; storage and processing of fruits and other methods needed to manage agricultural biodiversity.

Traditional knowledge about genetic resources, the registering and documentation of traditional knowledge, as well as the roster of varieties of traditional crops may be subject to regulation in the area of property rights. Essentially, this can be compared to real property rights for new technologies and regulated using the same approaches (new technology considers the principles and methods of use of the properties and qualities of genetic diversity as a resource for breeding or for actions toward the conservation of endangered species). At the level of local communities, the intellectual ownership of resources will facilitate benefit-sharing, while at the regional level it will help to recognize genetic resources as regional wealth and will provide additional sources of funding for biodiversity conservation at the national level. In this case, the protection system includes granting special rights to plant and animal breeders, the use of "confidential commercial information," and the use of copyrights. Protecting the rights to traditional "vernacular" varieties of plants and animals is crucial.

Options for developing *sui generis* systems for the protection of rights to traditional knowledge, including recognition of the uniqueness of traditional knowledge as a basis for creating a system of rights protection is possible, but only in combination with standard rights and intellectual property rights. The problem of access to genetic resources includes a variety of standard situations regulated under the already-existing legal and regulatory framework. Genetic resources, including their useful properties and their environmental functions, are considered goods and services, the use, ownership, sale, relocation and exchange of which may be regulated accordingly. Apparently, *sui generis* systems for wildlife, especially rare species and unique flora and fauna, will facilitate isolating their increasing value and more effective regulation of their use.

There are two areas to be considered for analysis of the interrelationship between a standard law that regulates register, use, or handover of traditional knowledge, on the one hand, and formal property rights, on the other hand:

1. using available capacity of national legislation. Uzbekistan has adopted fundamental laws such as:
 - *Patent Law*;
 - *Law On Breeding Achievements*;
 - *Law On State Regulation of Foreign Trade*;

which fully cover the legal aspects of storage, transfer, exchange and protection of formal rights to intellectual property, as well as traditional knowledge to some extent;

2. regulatory control of access to genetic resources and benefits may elaborate on rights to “physical/tangible property” for resources and to “intellectual property” for identified properties and derived products and technologies. A standard right is supplemented with “previously informed consent” and “mutually agreed conditions” from the Convention on Biodiversity and regulation of co-partnership in benefits and procedures of access as such .

The following mechanisms may be emphasized:

1. legal regulation: special national legislation on the use of genetic resources within the territory of their traditional use;
2. economic regulation: the preliminary economic estimate of genetic resources, economic stimulation of actions to conserve and sustainably use biodiversity;
3. social regulation: involvement of local self-government bodies and *hokimiyats*, protected natural territories, in identification and registration of the value of genetic resources within their habitats, and correlation of the current and future well-being of human populations to the preservation of their bioresources.

In all these cases, intellectual property rights and customary law interact, but they require special regulatory support enforcement. There is legal practice in this area, but it is still insufficient.

How can representation of intellectual property rights be ensured without hindering the sustainable use of genetic resources and associated knowledge? The main regulatory mechanism acts to determine the real and potential value of the resource, an opportunity for all who wish to benefit from its use and equitable sharing of benefits and risks. Harmonizing these requirements will not prevent the sustainable use of genetic resources and traditional knowledge as an element of technology. Intellectual property rights with regard to genetic resources and associated traditional knowledge should be held by local people or nations.

Conclusions

As a result of successive reforms in Uzbekistan directed at the development of the agricultural sphere, farm households have become the driving force of development. Organizational/legal frameworks for stimulating improvements in farm households, as well as the allocation of preferential loans to support them, ensure increase of productivity have been adopted. Currently, 66,134 farm households employing 1,5 million people are operating in the country. Proprietors, engaged in harvesting and processing of products and creating new work places, actively participate in the work of development and charity events. According to the decision of the President of the Republic of Uzbekistan *On Measures on Organization of the International Specialized*

Exhibition-sale of Mini Technologies and Compact Equipment for Agriculture of 24 August 2006, farmers were given an opportunity to become acquainted with, purchase and use modern equipment and technology. At the exhibition/sale conducted in 2010, farmers signed contracts to purchase modern equipment in the amount of 122 billion soums (77 mln. USD).

An agro-innovation center started operation in Uzbekistan in order to ensure the active participation of farmers in exhibitions, to introduce modern innovative projects in agriculture and to expand scales of their use in the associations of farm households of the country. Farm households are provided with information on experience in other countries and global achievements in the agricultural sector. The work of information/analytical centers was adjusted for further development and introduction of modern equipment and technologies in Khorezm, Ferghana, Kashkadarya, Bukhara, Samarkand and Tashkent Provinces.

The associations of farm households, being one of them a partner of the project “*In situ / on farm Conservation and Use of Agro-biodiversity (Horticulture Crops and Wild Fruit Species) in Central Asia*”, actively participate in organization of training events and workshops for farmers held jointly with the project.

An extensive network of market infrastructure entities providing services to farm households was established in the country. At present, a farmer should possess sufficient knowledge and professionalism to expand production in his household, increasing the volume of products and adjusting services. The Legal Expert Centre was established in the associations of farm households in Uzbekistan in order to protect property rights and to increase their legal knowledge. The positive appraisal of farmers’ work in the country, which provides a wide range of opportunities and incentives for property owners, is an important factor in ensuring the efficiency of farmers’ work.

Recommendations

1. To pay special attention to the improvement of farmers’ skills by training courses and workshops on the basis of scientific institutions, advanced farms, well-organized demonstrative plots and key nurseries.
2. To strengthen contacts between farmers as well as links of farmers with scientific researchers of scientific research institutions, farm associations, Departments of Agriculture of Districts and Rural Councils through the organization of meetings, round tables and meetings with policy makers, representatives of *hokimiyats* (Departments for the Management of Districts and Provinces) and knowledgeable farmers, for active participation of farmers in the process of decision making on the granting of intellectual property rights on created and allotted varieties and for conservation of traditional knowledge.
3. It is necessary to improve the awareness of farmers about existing plant genetic resources in the Republic through the organization of exhibitions, publication of

materials in journals and newspapers as well as performances on the radio and TV for wider access of farmers to plant genetic resources and to promote their more effective use.

4. To promote publishing catalogues, reference books and registers by project executors – scientific institutions of the Republic.
5. To pay special attention to joint publications with farmers in journals and newspapers about project results (allotted varieties and forms of fruit crops, traditional knowledge on management of agricultural biodiversity, etc.).

References

Decree of the President of Uzbekistan “*On State Program - «the Year of development and improvement of rural territories»*”, Legislative Assembly of the Republic of Uzbekistan, 2009, No 5, P. 33

Decree of the President of Uzbekistan “*On measures for organization of the International specialized fair of mini-technologies and compact equipments for agriculture*”, 24 August 2006

Law of the Republic of Uzbekistan “*On breeding achievements*”, Tashkent, 29 August 2002, No 395

Law of the Republic of Uzbekistan “*On seed production*”, Tashkent, 29 August 1996, No 267

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Law of the Republic of Uzbekistan “*On farming enterprises*”, Tashkent, 30 April 1998, No 692

Strategies for improving well being of population of the Republic of Uzbekistan for 2002-2010, developed by the Government of Uzbekistan



ANNEX I

Fruit and nut species under threat



KAZAKHSTAN

Persian mountain ash (*Sorbus persica* Hedl.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Grapevine (*Vitis vinifera* L.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Hawthorn (*Crataegus ambigua* C.A. Mey) - included in Red Data Book of the Republic of Kazakhstan (1996);

Ledebur's almond (*Amygdalys ledebouriana* Schltldl.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Apricot (*Armeniaca vulgaris* Lam.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Ili barberry (*Berberis iliensis* Popov) - included in Red Data Book of the Republic of Kazakhstan (1996);

Karkaralinskiy barberry (*Berberis karkaralensis* Kornil. & Potapov) - included in Red Data Book of the Republic of Kazakhstan (1996);

Niedzvetskiy apple (*Malus niedzwetzkiana* Deck) - included in Red Data Book of the Republic of Kazakhstan (1996);

Sievers apple (*Malus sieversii* (Ledeb.) M. Roem) - included in Red Data Book of the Republic of Kazakhstan (1996);

Bog cranberry (*Oxycoccus microcarpus* Turcz.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Pistachio (*Pistacia vera* L.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Yanchevkiy currant (*Ribes janczewskii* Pojark.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Pavlov's dog rose (*Rosa pavlovii* Chrshan.) - included in Red Data Book of the Republic of Kazakhstan (1996);

Sievers apple (*Malus sieversii*) – included in red list of IUCN as vulnerable (V);

Apricot (*Armeniaca vulgaris* Lam.) – included in redlist of IUCN as endangered (EN).


KYRGYZSTAN

- Kashgar barberry (*Berberis kaschgarica* Rupr.) – included in Red Data Book of Kyrgyz Republic (2005);
- Central Asian pear (*Pyrus asiae mediae* (M.Pop.) Maleev) - included in Red Data Book of Kyrgyz Republic (2005);
- Korzhinskiy pear (*Pyrus korshinskyi* Litv.) – included in Red Data Book of Kyrgyz Republic (2005);
- Niedzvetzky apple (*Malus niedzvetzkyana* Dieck.) – included in Red Data Book of Kyrgyz Republic (2005);
- Sievers apple (*Malus sieversii* (Ledeb.) M. Roem.) – included in Red Data Book of Kyrgyz Republic (2005);
- Knorring hawthorn (*Crataegus knorringiana* Pojark.) – included in Red Data Book of Kyrgyz Republic (2005);
- Persian Mountain ash (*Sorbus persica* Hedl.) – included in Red Data Book of Kyrgyz Republic (2005);
- Petunnikov's almond (*Amygdalus petunnikowii* Litv.) – included in Red Data Book of Kyrgyz Republic (2005);
- Uzunakhmat grapevine (*Vitis usunachmatica* Vass.) – included in Red Data Book of Kyrgyz Republic (2005);
- Strange honeysuckle (*Lonicera paradoxa* Pojark.) – included in Red Data Book of Kyrgyz Republic (2005);
- Chokecherry (*Padus racemosa*) – included in Red Data Book of Kyrgyz Republic (2005);
- Jujube (*Ziziphus jujube*) – included in Red Data Book of Kyrgyz Republic (2005);
- Walnut (*Juglans regia* L.) – included in red list of IUCN as near threatened (NT),
- Pistachio (*Pistacia vera* L.) – included in red list of IUCN as near threatened (NT),
- Bukhara almond (*Amygdalus bucharica* Korsh.) – included in red list of IUCN as vulnerable (V);
- Apricot (*Armeniaca vulgaris* Lam.) – included in red list of IUCN as endangered (EN);
- Niedzvetzky apple (*Malus niedzvetzkyana* Dieck.) – included in red list of IUCN as endangered (EN),
- Sievers apple (*Malus sieversii* (Ledeb.) M. Roem) – included in red list of IUCN as vulnerable (V),
- Korzhinskiy pear (*Pyrus korshinskyi* Litv.) – included in red list of IUCN as critically endangered (CR);
- Common grapevine (*Vitis vinifera* L.) – included in red list of IUCN as least concerned (LC);
- Central Asian pear (*Pyrus asiae-mediae* (M.Pop.) Maleev) – included in red list of IUCN as not estimated (NE).



TAJIKISTAN

Afgan fig (*Ficus afganistanica* Warb.) – included in Red Data Book of the Republic of Tajikistan (1988);

Common fig (*Ficus carica* L.) - included in Red Data Book of the Republic of Tajikistan (1988);

Darvaz hawthorn (*Crataegus darvasika* Pojark.) - included in Red Data Book of the Republic of Tajikistan (1988);

Vavilov's almond (*Amygdalus Vavilovii*) - included in Red Data Book of the Republic of Tajikistan (1988);

Pamirs-Alay hawthorn (*Crataegus Pamiroalaika* V. Zapr.) - included in Red Data Book of the Republic of Tajikistan (1988);

Pomegranate (*Punica granatum* L.) - included in Red Data Book of the Republic of Tajikistan (1988);

Darvaz plum (*Prunus darvasika* Temb.) - included in Red Data Book of the Republic of Tajikistan (1988);

Tajikistan plum (*Prunus tadshikistanika* V. Zapr.) - included in Red Data Book of the Republic of Tajikistan (1988);

Kayon Pear (*Pyrus cajan* V. Zapr.) - included in Red Data Book of the Republic of Tajikistan (1988);

Malvleafed currant (*Ribes malvifolium* Pojark) - included in Red Data Book of the Republic of Tajikistan (1988);

Caucasian persimmon (*Diospyros lotus* L.) - included in Red Data Book of the Republic of Tajikistan (1988).


TURKMENISTAN

- Walnut (*Juglans regia* L.) - included in Red Data Book of Turkmenistan (1999);
- Afgan fig (*Ficus afghanistanica*) - included in Red Data Book of Turkmenistan (1999);
- Black currant (*Rebes melananthum* Boiss. Et. Hohen) - included in Red Data Book of Turkmenistan (1999);
- Greek mountain ash (*Sorbus graeca* (Spah.) Lodd.ex Shauer) - included in Red Data Book of Turkmenistan (1999);
- Persian mountain ash (*Sorbus persica* Hede.) - included in Red Data Book of Turkmenistan (1999);
- Turkestan mountain ash (*Sorbus turkestanica* (Franch.)) - included in Red Data Book of Turkmenistan (1999);
- Turkmen pear (*Pyrus turkcomanica* Maleev) - included in Red Data Book of Turkmenistan (1999);
- Boissier pear (*Pyrus boissieriana huhse*) - included in Red Data Book of Turkmenistan (1999);
- Turkomen apple (*Malus turkomenorum* Juz. et. M. Pop.) - included in Red Data Book of Turkmenistan (1999);
- Nikitin's hawthorn (*Crataegus nikitinii* Essen. et. Kerim) - included in Red Data Book of Turkmenistan (1999);
- Pomegranate (*Punica granatum* L.) - included in Red Data Book of Turkmenistan (1999);
- Badkhyz pistachio (*Pistacia badghysi* K. Pop.) - included in Red Data Book of Turkmenistan (1999).



UZBEKISTAN

Central Asian pear (*Pyrus asiae-mediae* Popov.) – included in Red Data Book of the Republic of Uzbekistan (2011);

Caucasian persimmon (*Diospyros lotus* L.) - included in Red Data Book of the Republic of Uzbekistan (2011);

Malvleafed currant (*Ribes malvifolium* Pojark.) - included in Red Data Book of the Republic of Uzbekistan (2011);

Wild fig (*Ficus carica* L.) – included in Red Data Book of the Republic of Uzbekistan (2011);

Pomegranate (*Punica granatum* L.) – included in Red Data Book of the Republic of Uzbekistan (2011);

Common grapevine (*Vitis vinifera* L.) - included in Red Data Book of the Republic of Uzbekistan (2011).



ANNEX II

Natural protected areas for conservation of wild fruit and nut species in Central Asia

	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
KAZAKHSTAN	Aksu-Djabagli State Nature Reserve Category IUCN - I Area - 131 934 ha Year of establishment - 1926	Sievers apple (<i>Malus sieversii</i>)
	Almaty State Nature Reserve Category IUCN - I Area - 71 700 ha Year of establishment - 1964	Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Armeniaca vulgaris</i> Lam.)
	State Nature Refugium "Urochishe Karakunduz" Category IUCN - IV Area - 3 070 ha Year of establishment - 1971	Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Armeniaca vulgaris</i> Lam.)
	Ili-Alatau National Nature Park Category IUCN - II Area - 199 703 ha Year of establishment - 1996	Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Armeniaca vulgaris</i> Lam.)
	Karatau State Nature Reserve Category IUCN - I Area - 34 300 ha Year of establishment - 2004	Sievers apple (<i>Malus sieversii</i>)
	Sairam-Ugam State National Nature Park Category IUCN - II Area - 149 053 ha Year of establishment - 2006	Sievers apple (<i>Malus sieversii</i>)
	Jongar-Alatau State National Nature Park Category IUCN - II Area - 356 022 ha Year of establishment - 2010	Sievers apple (<i>Malus sieversii</i>)
KYRGYZSTAN	Issyk Kul State Nature Reserve Category IUCN - I Area - 19 661 ha Year of establishment - 1948	Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Tianshan sour cherry (<i>Cerasus tianschanica</i>) Spherical-fruited barberry (<i>Berberis sphaerocarpa</i>) Wild rose (<i>Rosa</i> spp.)
	Sari-Chelek State Biosphere Reserve Category IUCN - I Area - 23 868 ha Year of establishment - 1959	Sievers apple (<i>Malus sieversii</i>) Niedzwetzky apple (<i>Malus niedzwetzkyana</i>) Kyrgyz apple (<i>Malus kirghizorum</i> Al. et An. Thaed.) Walnut (<i>Juglans regia</i>) Central Asian pear (<i>Pyrus asiae-mediae</i>) Korzhinskiy pear (<i>Pyrus korshinskyi</i>) Regel pear (<i>Pirus regelii</i>) Pear (<i>Pyrus communis</i>) Alycha (<i>Prunus divaricata</i>) Wild rose (<i>Rosa</i> spp.) Black cotoneaster (<i>Cotoneaster melanocarpus</i>)
	State National Nature Park "Kara -Shoro" Category IUCN - II Area - 8 450 ha Year of establishment - 1966	Walnut (<i>Juglans regia</i> L.) Sievers apple (<i>Malus sieversii</i>) Pistachio (<i>Pistacia vera</i>) Petunnikov almond (<i>Amygdalus petunnikowii</i> Litv.) Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Wild rose (<i>Rosa</i> spp.) Tianshan hawthorn (<i>Crataegus tianschanica</i>) Mahaleb cherry (<i>Cerasus mahaleb</i> L.) Meyer's currant (<i>Ribes meyeri</i>) Spherical-fruited barberry (<i>Berberis sphaerocarpa</i>) Alycha (<i>Prunus divaricata</i>) Black cotoneaster (<i>Cotoneaster melanocarpus</i>)

KYRGYZSTAN	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
	Dashman State Forest Refugium Category IUCN – III Area - 5 000 ha Year of establishment - 1975	Walnut (<i>Juglans regia</i>)
Ala-Archa State National Nature Park Category IUCN – II Area - 3 783 ha Year of establishment – 1976	Persian mountain ash (<i>Sorbus persica</i>)	
Djalgidin State Forest Refugium Category IUCN – III Area – 300 ha Year of establishment – 1976	Pistachio (<i>Pistacia vera</i>)	
Chirandin State Botanical Refugium Category IUCN – III Area – 500 ha Year of establishment – 1978	Pistachio (<i>Pistacia vera</i>)	
Besh-Aral State Reserve Category IUCN – I Area - 112 018 ha Year of establishment – 1979	Walnut (<i>Juglans regia</i> L.) Sievers apple (<i>Malus sieversii</i>) Pistachio (<i>Pistacia vera</i>) Petunnikov almond (<i>Amygdalus petunnikowii</i> Litv.) Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Wild rose (<i>Rosa</i> spp.) Tianshan hawthorn (<i>Crataegus tianschanica</i>) Mahaleb cherry (<i>Cerasus mahaleb</i> L.) Meyer's currant (<i>Ribes meyeri</i>), Spherical-fruited barberry (<i>Berberis sphaerocarpa</i>) Alycha (<i>Prunus divaricata</i>) Black cotoneaster (<i>Cotoneaster melanocarpus</i>)	
Naryn State Reserve Category IUCN – I Area - 91 023,50 ha Year of establishment - 1983	Tianshan mountain ash (<i>Sorbus tianschanica</i>) Wild rose (<i>Rosa</i> spp.) Meyer's currant (<i>Ribes meyeri</i>) Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Kashgar barberry (<i>Berberis kaschgarica</i> Rupr) Black cotoneaster (<i>Cotoneaster melanocarpus</i>)	
Razansay State Botanical Refugium Category IUCN – III Area - 14 771 ha Year of establishment - 1992	Uzunakhmat grapevine (<i>Vitis usunachmatica</i> Vass.) Pomegranate (<i>Punica granatum</i>) Fig (<i>Ficus carica</i>)	
State National Nature Park “Kyrgyz Ata” Category IUCN – II Area - 11 172 ha Year of establishment - 1992	Walnut (<i>Juglans regia</i> L.) Sievers apple (<i>Malus sieversii</i>) Pistachio (<i>Pistacia vera</i>) Petunnikov's almond (<i>Amygdalus petunnikowii</i> Litv.) Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Wild rose (<i>Rosa</i> spp.) Tianshan hawthorn (<i>Crataegus tianschanica</i>) Mahaleb cherry (<i>Cerasus mahaleb</i> L.) Meyer's currant (<i>Ribes meyeri</i>), Spherical-fruited barberry (<i>Berberis sphaerocarpa</i>) Alycha (<i>Prunus divaricata</i>)	

Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area	
KYRGYZSTAN	Karatal-Japyryk State Reserve Category IUCN - I Area - 36 449 ha Year of establishment - 1994	Wild rose (<i>Rosa</i> spp.)
	Sarychat-Ertash State Reserve Category IUCN - I Area - 134 140 ha Year of establishment - 1995	Kashgar barberry (<i>Berberis kaschgarica</i> Rupr.)
	State National Nature Park "Karakol" Category IUCN - I Area - 38 148 ha Year of establishment - 1997	Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Tianshan sour cherry (<i>Cerasus tianschanica</i>) Spherical-fruited barberry (<i>Berberis sphaerocarpa</i>) Wild rose (<i>Rosa</i> spp.)
	State National Nature Park "Chon Kemin" Category IUCN - II Area - 123 654 ha Year of establishment - 1997	Sievers apple (<i>Malus sieversii</i>)
	State National Nature Park "Salkyn Tor" Category IUCN - II Area - 10 439,2 ha Year of establishment - 2001	Sea buckthorn (<i>Hippophae rhamnoides</i> L.) Blackcurrant (<i>Ribes nigrum</i> L.) Mountain ash (<i>Sorbus vulgaris</i>)
	Padyshtan State Reserve Category IUCN - I Area - 15 846 ha Year of establishment - 2003	Walnut (<i>Juglans regia</i> L.) Yanchevskiy currant (<i>Ribes janczevskii</i>) Persian mountain ash (<i>Sorbus persica</i>) Sievers apple (<i>Malus sieversii</i>) Niedzwetzky apple (<i>Malus niedzwetzkyana</i>) Alycha (<i>Prunus divaricata</i>) Tianshan hawthorn (<i>Crataegus tianschanica</i>) Central Asian pear (<i>Pyrus asiae-mediae</i>) Korzhinskiy pear (<i>Pyrus korshinskyi</i>)
	Kulunata National State Reserve Category IUCN - I Area - 27 780 ha Year of establishment - 2004	Niedzwetzky apple (<i>Malus niedzwetzkyana</i> Dieck) Central Asian pear (<i>Pyrus asiae-mediae</i>) Korzhinskiy pear (<i>Pyrus korshinskyi</i>) Barberry (<i>Berberis</i> sp.) Janczewski's currant (<i>Ribes janczevskii</i>) Meyer's currant (<i>Ribes meyeri</i>) Persian mountain ash (<i>Sorbus persica</i>) Tianshan ash tree (<i>Sorbus tianschanica</i>) Wild rose (<i>Rosa</i> spp.)
	Reserve plot "Sandalash" Category IUCN - III Area - 25 270 ha Year of establishment - 2006	Walnut (<i>Juglans regia</i> L.) Sievers apple (<i>Malus sieversii</i>) Hawthorn (<i>Crataegus sanguinea</i> Pall) Mahaleb cherry (<i>Cerasus mahaleb</i> L.)
	Surmatash State Reserve Category IUCN - I Area - 66 194 ha Year of establishment - 2009	Apricot (<i>Armeniaca vulgaris</i>) Grapevine (<i>Vitis vinifera</i>) Pear (<i>Pyrus communis</i>) Peach (<i>Prunus persica</i> L.) Sour cherry (<i>Prunus cerasus</i>) Pomegranate (<i>Punica granatum</i>) Fig (<i>Ficus carica</i>) Sievers apple (<i>Malus sieversii</i>)
	State National Nature Park "Sarkent" Category IUCN - I Area - 40 000 ha Year of establishment - 2009	Apricot (<i>Armeniaca vulgaris</i>) Grapevine (<i>Vitis vinifera</i>) Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i>) Peach (<i>Prunus persica</i> L.) Sour cherry (<i>Prunus cerasus</i>) Pomegranate (<i>Punica granatum</i>) Fig (<i>Ficus carica</i>)

TAJIKISTAN	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
	State Nature Reserve "Tigrovaya Balka" Category IUCN – I Area - 47 409 ha Year of establishment - 1938	Pistachio (<i>Pistacia vera</i> L.) Sievers apple (<i>Malus sieversii</i>) Grapevine (<i>Vitis vinifera</i> L.) Apricot (<i>Prunus armeniaca</i> L.)
Forestry, named after A. Kholov (Khuroson district, Khatlon province) Category IUCN – III Area - 71 000 ha Year of establishment – 1950	Pistachio (<i>Pistacia vera</i> L.) Bukhara almond (<i>Amygdalus bucharica</i>) Regel pear (<i>Pyrus regelii</i>)	
Dangara Forestry Category IUCN – III Area - 35 000 ha Year of establishment – 1952	Pistachio (<i>Pistacia vera</i> L.) Bukhara almond (<i>Amygdalus bucharica</i>)	
Pyandj Forestry Category IUCN – III Area - 34 000 ha Year of establishment – 1953	Pistachio (<i>Pistacia vera</i> L.) Bukhara almond (<i>Amygdalus bucharica</i>)	
State Nature Reserve "Ramit" Category IUCN - I Area - 16 139 ha Year of establishment – 1959	Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i>) Grapevine (<i>Vitis vinifera</i> L.) Peach (<i>Prunus persica</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Sour cherry (<i>Prunus cerasus</i> L.) Alycha (<i>Prunus cerasifera</i> Ehrh.)	
State Nature Refugium "Kusavlin" Category IUCN – III Area - 12 844 ha Year of establishment – 1959	Apricot (<i>Prunus armeniaca</i> L.) Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Walnut (<i>Juglans regia</i> L.)	
State Nature Refugium "Iskanderkul" Category IUCN – III Area - 30 000 ha Year of establishment – 1969	Apricot (<i>Prunus armeniaca</i> L.) Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Walnut (<i>Juglans regia</i> L.)	
State Nature Refugium "Sayvatin" Category IUCN – III Area - 4 200 ha Year of establishment – 1970	Apricot (<i>Prunus armeniaca</i> L.) Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Peach (<i>Prunus persica</i> L.) Walnut (<i>Juglans regia</i> L.)	
State Nature Refugium "Kamarob" Category IUCN – III Area - 9 000 ha Year of establishment – 1970	Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.)	
State Nature Refugium "Childukhtaron" Category IUCN – III Area - 14 500 ha Year of establishment – 1970	Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Prunus armeniaca</i> L.) Pear (<i>Pyrus communis</i>) Peach (<i>Prunus persica</i> L.) Grapevine (<i>Vitis vinifera</i>) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.)	

TAJIKISTAN	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
	<p>State Nature Refugium “Karatau” Category IUCN – III Area - 14 500 ha Year of establishment – 1972</p> <p>State Nature Refugium “Dashtidujum” (Dashtidjum district, Khatlon province) Category IUCN – III Area - 50 100 ha Year of establishment – 1972</p> <p>State Nature Refugium “Sangvor” Category IUCN – III Area - 50 900 ha Year of establishment – 1972</p> <p>State Nature Refugium “Zarafshon” Category IUCN – III Area - 2 300 ha Year of establishment – 1976</p> <p>State Nature Refugium “Aktash” Category IUCN – III Area - 15 000 ha Year of establishment – 1977</p> <p>State Nature Reserve “Dashtidjum” Category IUCN – I Area - 19 000 ha Year of establishment – 1983</p> <p>State Nature Refugium “Almosi” Category IUCN – III Area - 6 000 ha Year of establishment – 1983</p> <p>State Nature Refugium “Nurek” Category IUCN – III Area - 30 000 ha Year of establishment – 1984</p> <p>Ramit Forestry Category IUCN – III Area - 62 381 ha Year of establishment – 1990</p> <p>Shurabad Forestry Category IUCN – III Area - 17 600 ha Year of establishment – 1991</p>	<p>Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Mahaleb cherry (<i>Cerasus mahaleb</i> L.)</p> <p>Pistachio (<i>Pistacia vera</i>) Pomegranate (<i>Punica granatum</i>) Fig (<i>Ficus carica</i>) Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Prunus armeniaca</i>) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.)</p> <p>Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Prunus armeniaca</i>) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Sea buckthorn (<i>Hippophae rhamnoides</i> L.)</p> <p>Sievers apple (<i>Malus Sieversii</i>) Grapevine (<i>Vitis vinifera</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.)</p> <p>Apricot (<i>Prunus armeniaca</i>) Sievers apple (<i>Malus sieversii</i>) Walnut (<i>Juglans regia</i> L.) Pear (<i>Pyrus communis</i> L.) Grapevine (<i>Vitis vinifera</i>)</p> <p>Sievers apple (<i>Malus sieversii</i>) Grapevine (<i>Vitis vinifera</i> L.) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Alycha (<i>Prunus cerasifera</i> Ehrh.)</p> <p>Apricot (<i>Prunus armeniaca</i> L.) Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Sour cherry (<i>Cerasus</i> L.)</p> <p>Sievers apple (<i>Malus sieversii</i>) Apricot (<i>Prunus armeniaca</i> L.) Pistachio (<i>Pistacia vera</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.)</p> <p>Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Mahaleb cherry (<i>Cerasus mahaleb</i> L.)</p> <p>Pistachio (<i>Pistacia vera</i> L.) Bukhara almond (<i>Amygdalus bucharica</i>)</p>

	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
TAJIKISTAN	Tajik National Nature Park Category IUCN – II Area - 2 500 000 ha Year of establishment – 1992	Sievers apple (<i>Malus sieversii</i>) Pear (<i>Pirus communis</i> L.) Peach (<i>Prunus persica</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Alycha (<i>Prunus cerasifera</i> Ehrh.)
	Shirkent National Nature Park Category IUCN – II Area - 3 000 ha Year of establishment – 1993	Sievers apple (<i>Malus sieversii</i>) Grapevine (<i>Vitis vinifera</i> L.) Pear (<i>Pyrus communis</i> L.) Peach (<i>Prunus persica</i> L.) Apricot (<i>Prunus armeniaca</i> L.) Walnut (<i>Juglans regia</i> L.) Hawthorn (<i>Crataegus sanguinea</i> Pall.) Alycha (<i>Prunus cerasifera</i> Ehrh.)
TURKMENISTAN	Badkhyz State Reserve Category IUCN – I Area - 144700 ha Year of establishment - 1941	Pistachio (<i>Pistacia vera</i> L.) Badkhyz pistachio (<i>Pistacia badghysi</i> K.Pop.) Turcoman almond (<i>Amygdalus turcomanica</i>) Brahui almond (<i>Amygdalus brahuica</i>) Afgan fig (<i>Ficus afganistanica</i>) Fig (<i>Ficus carica</i>)
	Kopetdag State Reserve Category IUCN – I Area – 159 610 ha Year of establishment - 1976	Turkestan mountain ash (<i>Sorbus turkestanica</i> (Franch.)) Persian mountain ash (<i>Sorbus persica</i>) Turkmen hawthorn (<i>Crataegus turcomanica</i>) Ponti hawthorn (<i>Crataegus pontica</i>) Plum alycha (<i>Prunus cerasifera</i>) Turkmen almond (<i>Amygdalus turkomanica</i>) Pistachio (<i>Pistacia vera</i> L.) Turkmen almond (<i>Amygdalus turcomanica</i>) Pistachio (<i>Pistacia vera</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Pomegranate (<i>Punica granatum</i> L.) Afgan fig (<i>Ficus afganistanica</i>) Fig (<i>Ficus carica</i>) Turkmen cotoneaster (<i>Cotoneaster turkomanicus</i>) Pear (<i>Pyrus communis</i>) Turkmen pear (<i>Pyrus turcomanica</i>) Turkmen apple (<i>Malus sieversii</i> var. <i>turkomenorum</i>) Walnut (<i>Juglans regia</i>)
	Syunt-Khasardag State Reserve Category IUCN – I Area – 30 300 ha Year of establishment - 1978	Walnut (<i>Juglans regia</i> L.) Fig (<i>Ficus carica</i>) Turkmen apple (<i>Malus sieversii</i> var. <i>turkomenorum</i>) Almond (<i>Amygdalus communis</i>) Wild almond (<i>Amygdalus scoparia</i>) Quince (<i>Cydonia oblonga</i>) Boissier pear (<i>Pyrus bioessieriana huhse</i>) Pear (<i>Pyrus communis</i>) Turkmen pear (<i>Pyrus turkomanica</i> Maleev) Greek mountain ash (<i>Sorbus graeca</i>) Plum alycha (<i>Prunus cerasifera</i>) Pomegranate (<i>Punica granatum</i> L.) Grapevine (<i>Vitis vinifera</i> L.) Forest grapevine (<i>Vitis sylvestris</i>) Blinovskiy cherries (<i>Cerasus blinovskiyi</i>)

UZBEKISTAN	Specially protected natural area Category Area, ha Year of establishment	Fruit and nut species found in the protected area
	Koytendag State Reserve Category IUCN – I Area – 122 730 ha Year of establishment – 1986	Walnut (<i>Juglans regia</i> L.) Bukhara almond (<i>Amygdalis bukharica</i>) Spike almond (<i>Amygdalus spinossima</i>) Regel pear (<i>Pyrus regelli</i>) Jujube (<i>Ziziphus jujube</i>) Turkistan hawthorn (<i>Crataegus turkestanica</i>) Pistachio (<i>Pistacia vera</i> L.) Turkmen barberry (<i>Berberis turcomanica</i>) Red sour cherry (<i>Cerasus erythrocarpa</i>) Almond shaped sour cherry (<i>Cerasus amygdaliflora</i>) Mahaleb cherry (<i>Cerasus mahaleb</i>)
Zaamin State Reserve Category IUCN – I Area – 2684 ha Year of establishment – 1926	Ponti hawthorn (<i>Crataegus pontica</i>) Sievers apple (<i>Malus sieversii</i>)	
Chatkal State Biosphere Reserve Category IUCN – I Area – 35 255 ha Year of establishment – 1947	Walnut (<i>Juglans regia</i> L.) Pistachio (<i>Pistacia vera</i> L.) Bukhara almond (<i>Amygdalis bukharica</i>) Sievers apple (<i>Malus sieversii</i>) Alycha (<i>Prunus</i> sp.) Ponti hawthorn (<i>Crataegus pontica</i>) Oleaster (<i>Elaeagnus orientalis</i>)	
Kyzylkum State Reserve Category IUCN – I Area – 10 311 ha Year of establishment – 1971		
Zarafshan State Mountain Reserve Category IUCN – I Area – 26 840 ha Year of establishment – 1975	Ponti hawthorn (<i>Crataegus pontica</i>)	
Nurata State Mountain Reserve Category IUCN – I Area – 15 322 ha Year of establishment – 1975	Almond (<i>Amygdalis</i> sp.) Hawthorn (<i>Crataegus</i> sp.) Pistachio (<i>Pistachio vera</i>)	
Zaamin National Park Category IUCN – II Area – 2 411 ha Year of establishment – 1976	Ponti hawthorn (<i>Crataegus pontica</i>) Sievers apple (<i>Malus sieversii</i>) Alycha (<i>Prunus</i> sp.) Walnut (<i>Juglans regia</i> L.)	
Gissar State Reserve Category IUCN – I Area – 80 986 ha Year of establishment – 1983	Ponti hawthorn (<i>Crataegus pontica</i>) Sievers apple (<i>Malus sieversii</i>) Alycha (<i>Prunus</i> sp.) Oleaster (<i>Elaeagnus orientalis</i>)	
Surkhan State Reserve Category IUCN – I Area - 24 583 ha Year of establishment – 1987	Hawthorn (<i>Crataegus</i> sp.) Alycha (<i>Prunus</i> sp.)	
Ugam-Chatkal State National Nature Reserve Category IUCN – I Area –57 459 ha Year of establishment - 1990	Ponti hawthorn (<i>Crataegus pontica</i>) Sievers apple (<i>Malus sieversii</i>) Alycha (<i>Prunus</i> sp.) Walnut (<i>Juglans regia</i> L.)	



ANNEX III

Intellectual property rights and farmers' rights legislation

Intellectual property rights and farmers' rights legislation

	Farmers' Rights/ Conservation & sustainable use of plant genetic resources	Traditional Knowledge	Seed Law	Plant Variety Protection Law	Union for the Protection of New Varieties of Plants- UPOV
KAZAKHSTAN		Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO) in force in the country since March 28, 2012	Law No. 385-II, 8 February 2003, On Seed Production	Law No 237-III LRK 2 March 2007 on the Protection of Selection Achievements	
KYRGYZSTAN	International Treaty on Plant Genetic Resource for Food and Agriculture; in force in the country since August 30, 2009	Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO) in force in the country since February 6, 2007 Law 26 June 2007 on the Protection of Traditional Knowledge	Seed Law, January 8, 2007	Law 26 May 1998 on Legal Protection of Selection Achievements	UPOV-1991 Act; in force in the country since 26/ June/2000
TAJIKISTAN	Draft Law "On Conservation and Sustainable use of Genetic Resources of Cultivated Plants", 21 October 2011	Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO) in force in the country since November 17, 2010	Law No. 355, 5 January 2008 on Seed Breeding	Law No. 672, Dec 29 on Plant Variety Protection	Application to UPOV – 1991 Act (application has been approved)
TURKMENISTAN		Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO) in force in the country since February 25, 2012	Law 10 May 2010, on Seed Production	Law 4 August 2011 on Legal Protection of New Varieties of Plants	
UZBEKISTAN		Convention for the Safeguarding of Intangible Cultural Heritage (UNESCO) in force in the country since April 29, 2008	Law 29 August 1996 on Seed Production	Law N0. 395, 29 August 2002 on Selection Achievements	UPOV-1991 Act; in force in the country since 14/ November/2004

Conservation of fruit tree diversity in Central Asia: Policy options and challenges



