



**Gardening the wild – Growing the mind:
Fostering Kyrgyzstan’s botanical community to advance public
outreach and environmental awareness**

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Gardening the wild – growing the mind: fostering Kyrgyzstan’s botanical community to advance public outreach and environmental awareness

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1. Introduction

As a region hailed for its botanical diversity in landraces, local ecotypes and crop wild relatives, the Central Asian Kyrgyz Republic has been a focus country for a multitude of related research and conservation efforts especially over the last thirty years. Home to some 4,100 vascular plant species of which 139 are considered national endemics and around 1,500 are regional endemics to the wider area of the Mountains of Central Asia Hotspot identified by Conservation International in 2005 (RBGK, 2012), this floral wealth includes also over 130 species of ancestry forms of wild relatives of economically important crops found in Kyrgyzstan’s Tien Shan region (Dzunuzova, 2008), notably various fruit and nut bearing trees. Exploitation of timber and fuelwood, grazing and fire, have been highlighted as major causes threatening the survival of many of these species and their populations (Eastwood *et al.*, 2009). The second edition of the Kyrgyz Republic Red Data Book (State Agency on Environment Protection and Forestry *et al.*, 2006) documents some 83 higher plants of conservation concern, including a number of crop wild relatives such as *Amygdalus petunnikowii*, *Malus niedzwetzkyana* and *M. sieversii*, *Pyrus korshinskyi*, *Sorbus persica* and *Vitis usunachmatica*. A regional conservation status assessment (Eastwood *et al.*, 2009), has recorded a number of additional, crop wild relative tree species as threatened.

The links between local varieties and crop wild relatives occurring in relative proximity in the forests of southern Kyrgyzstan, and related local knowledge of use and management practice, illustrate in turn the close relationship between biological and cultural diversity (United Nations Development Programme *et al.*, 2001). This is exemplified by a growing number of environmental initiatives in the region that focus their efforts on bio-cultural conservation challenges. Despite this more targeted attention in recent years, crop wild relatives by and large are still not considered flagship or iconic ‘members’ of biodiversity, and mobilising resources for research, conservation, capacity building and public outreach remains a challenge (Hunter, 2011). As elsewhere in other centres of crop wild relatives of the world, addressing successfully conservation threats and development of sustainable management approaches is further compounded in Kyrgyzstan by a generally limited awareness of the ecological and socio-economic relevance and cultural value of these species within the policy and decision making arena and the public at large.

As part of a highly interdisciplinary project funded by the United Kingdom's Department for Environment, Food and Rural Affairs between 2009 and 2012, Botanic Gardens Conservation International (BGCI) has been working with Gareev Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic to develop public outreach activities on the importance to safeguard Kyrgyzstan's fruit and nut bearing tree species and the ecosystems they are part of. This paper provides an account of the work undertaken with a general introduction and overview of the status of botanic gardens in Central Asia and Kyrgyzstan.

2. Overview of botanic gardens in Central Asia and Kyrgyzstan

2.1 Defining botanic gardens

As major centres for botanical research, conservation, horticulture and education, botanic gardens play a major role in integrated conservation and development involving the wider public (Wyse Jackson *et al.*, 2000). Generally defined as 'institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education' (Wyse Jackson, 1999), botanic gardens offer an ideal venue for public outreach receiving over 200 million visitors each year (BGCI, 2012). While scientifically documented plant collections constitute *the* characteristic feature distinguishing botanic gardens from institutions such as public parks and amenity planting areas, botanic gardens place different emphasis on the above functions. This gives each botanic garden its distinctive character and special role reflected in its specific purpose, organisational structure and location.

2.2 Central Asia's botanic garden community in the former USSR and post 1991

In Kyrgyzstan as in other countries of the former Union of Soviet Socialist Republics (USSR), botanic gardens mainly served as institutions under the authority of the Academy of Sciences, the Ministry of Education or the respective municipality undertaking scientific studies in traditional areas of plant taxonomy, biosystematics, or research in plants of socio-economic importance and utility (Kuzevanov *et al.*, 2006). Comparatively less or no attention was paid to the potential role in raising environmental awareness using the botanic gardens' living plants collections. The disintegration of the USSR and creation of the Commonwealth of Independent States in 1991 including Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, and the almost concurrently ushering in of a new era for conservation at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil in 1992, also had a profound influence on the landscape of Central Asia's botanical community.

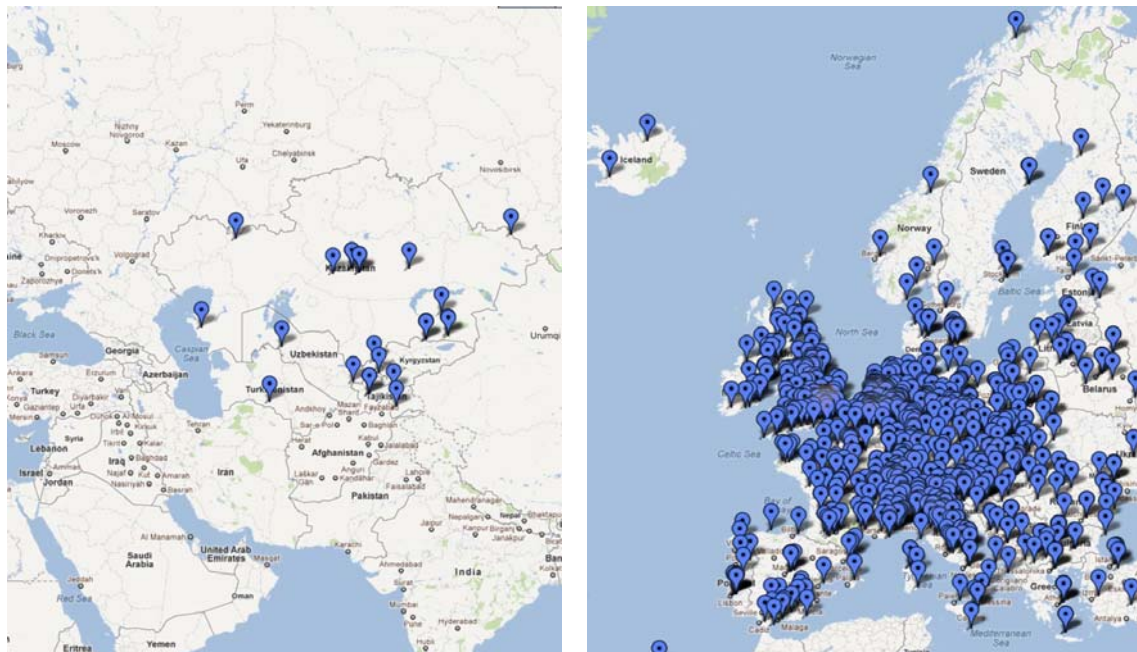
Providing a new opportunity to take on contemporary challenges and perspectives in conservation, especially related to rapid global change at demographic and climatic levels (Heywood, 2010), lack of facilities, resources and management capacity (State Agency on

Environment Protection and Forestry *et al.*, 2008), however, are not only hampering Kyrgyzstan’s botanic garden development and environmental outreach capacity. It is a challenge for the region at large and any institution dedicated to environmental protection and biodiversity conservation in Central Asia (International Fund for Saving the Aral Sea *et al.*, 2007). The scope to enhance institutional and administrative competencies in Central Asia to raise environmental awareness and strengthen public outreach as well as interest and participation in conservation action remains enormous (European Community, 2007).

2.3 Present-day situation of botanic gardens in Central Asia and Kyrgyzstan

Strengthening the capacity of existing and new botanic gardens which are still sparsely distributed throughout the region and mainly located in the major urban centres of Central Asia to advance conservation and environmental education, represents an ongoing priority in securing Central Asia’s unique botanical wealth for generations to come. According to BGCI’s records, some 23 related institutions are listed in BGCI’s GardenSearch database (BGCI, 2012), in comparison and stark contrast to over 870 botanic gardens in western Europe represented on a comparable, though to some extent bigger land mass (**Figure 1**). These include 11 botanic gardens and affiliated institutions in Kazakhstan, 2 in Kyrgyzstan, 5 in Tajikistan, 1 in Turkmenistan and 4 in Uzbekistan. Gareev Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic (NASKR) and the botanic garden of the Kyrgyz National University of Balasagyn, Ministry of Education, are Kyrgyzstan’s main botanic gardens.

Figure 1: Distribution of botanic gardens in Central Asia and western Europe



3. *Ex situ* conservation, environmental education and public outreach through Kyrgyzstan's botanic gardens

3.1 Current *ex situ* conservation initiatives

As elsewhere in the world, Kyrgyzstan is pursuing various research and *ex situ* conservation initiatives through living collections and germplasm banks, especially for economically important plant species and their wild relatives. Related work is carried out in particular by the Kyrgyz National Agrarian University, the Kyrgyz National University, Osh Technological University, the Kyrgyz Technical University, and the National Academy of Sciences of the Kyrgyz Republic.

Founded in 1954 under the Academy of Sciences of the former USSR (Cross, 1996), the National Academy of Sciences of the Kyrgyz Republic (NASKR) maintains a leading position within Kyrgyzstan's institutes of higher learning related to environment and natural resources. Its aim is to advance basic research in and knowledge on nature and society, promote new technologies and goods, enhance the development of strategic sectors and public processes and secure innovation and growth by integrating science, production and vocational education (NASKR, 2012). NASKR comprises more than 13 scientific research institutes including Gareev Botanical Garden in Bishkek. In collaboration with the Royal Botanic Gardens Kew Millennium Seed Banking Worldwide programme, the Institute of Biotechnology of NASKR and its sister Institute of Biology and Pedology opened the first seed bank for wild species in the country in 2008. To date, the project partners have collected and conserved over 400 native species in-country and at the Millennium Seed Bank in Wakehurst, United Kingdom (RBGK, 2012). An assessment of institutions with major *ex situ* collections including those of the Kyrgyz Research Institute of Farming, the Institute of Biology and Montane Forests and Gareev Botanical Garden of NASKR estimated some 1527 accessions of agricultural crops (Dzunusova, 2008). The *Fourth National Report on Conservation of Biodiversity of the Kyrgyz Republic* (State Agency on Environment Protection and Forestry *et al.*, 2008) encourages that all endemic species should be secured through *ex situ* conservation in botanic gardens in Kyrgyzstan. Living *ex situ* conservation collections are especially maintained by Gareev Botanical Garden, NASKR, and the botanic garden under the Department of Biology of the Kyrgyz National University of Balasagyn, Ministry of Environment, Bishkek. The national herbarium is kept at the Institute of Biology and Pedology, NASKR.

3.1.1 Viability of *ex situ* collections

Maintaining viable *ex situ* collections plays a critical role in determining the value of *ex situ* conservation, ultimately, as an insurance policy for the future. This has been a topic of long-standing and ongoing debate (Falk *et al.*, 1991; Guerrant *et al.*, 2004; Volis *et al.*, 2010; Kozłowski *et al.*, 2012). Collections with the most direct conservation application (e.g. for *in situ* restoration and reintroduction programmes) are genetically diverse and

representative of the species, and must be managed to ensure the material is genetically sound and available for research and conservation activities over the long-term. Many *ex situ* collections today do not meet these standards due primarily to limited genetic diversity, unknown provenance of the plant material, or loss of genetic diversity via drift or adaptation to cultivation and hybridisation (BGCI, 2012). As shown in assessments carried out by Botanic Gardens Conservation International in Europe and North America (Sharrock *et al.*, 2009; Kramer *et al.*, 2011), a significant number of threatened taxa/species are in *ex situ* conservation by very few gardens (often even only one), while few taxa of rare and threatened species are widely distributed over various *ex situ* collections in different locations. What's more, genetic diversity of cultivated taxa/species is often underrepresented, or worse, the provenance of the plant material is unknown making its use in conservation programmes less valuable.

While it is beyond the scope of this study to provide an analysis of the genetic diversity and representativeness of the plant material held in national plant conservation collections, *ex situ* conservation in Kyrgyzstan is faced with similar challenges as elsewhere in the world. Future surveys and inventories need also to consider the dynamic nature of living plant collections, requiring tremendous resources in personnel and funding for their management. Stronger coordination of collection policies and priorities of both, living collections and other germplasm banks, is as critical step to advance collections management standards guaranteeing conservation and research value of collections in the long-term.

3.1.2 Planning and monitoring tools for *ex situ* conservation – BGCI Plant- and GardenSearch databases

As the world's largest network of botanic gardens and affiliated institutions, Botanic Gardens Conservation International (BGCI) works with members and partners from nearly 120 countries. BGCI links botanic gardens through membership, international congresses, facilitation of regional and national networks, and a number of informational resources pertaining to the work of botanic gardens including publications and data related to their *ex situ* collections and organisational setup – namely BGCI Plant- and GardenSearch databases.

▪ PlantSearch

In order to monitor *ex situ* conservation progress globally, institutions that hold *ex situ* collections are encouraged to make their living collections' information available in BGCI's global PlantSearch database. Launched in 2002, this free, online database allows institutions to upload lists of taxa maintained in their *ex situ* collections, and then compiles all uploaded data into a single list of taxa. Linked to other global databases including the *IUCN Red List of Threatened Species* (**Figure 2**), BGCI's *PlantSearch*

database presently holds over one million records representing nearly 240,000 taxa including some 60 species provided by Gareev Botanical Garden, NASKR.

For institutions that contribute information to PlantSearch, the database provides a collection management tool, allowing botanic gardens to identify threatened species or species related to other categories from amongst their own collections and to establish how many other gardens are cultivating the same species. Using PlantSearch, a botanic garden can for example identify if they are the only institution cultivating a particular globally threatened species, or develop research collaboration with other gardens working on the same species. PlantSearch can thus help gardens to analyse the conservation 'value' of their collections and allow prioritisation of conservation action. For instance, staff at the United States Botanic Garden in Washington DC used PlantSearch to identify globally threatened species in their collections in order to incorporate Red List labels in their displays and education programmes.

Figure 2: BGCI's PlantSearch database – Example of *Pyrus korshinskyi*

The screenshot shows the BGCI PlantSearch database interface. The search results for *Pyrus korshinskyi* are displayed in a table with the following data:

| # | Plant Name | No. found in BGCI worldwide | IUCN Red List | IUCN Red List 1997 | IPIS | Images on Google | Tropicos | CWR | Plants of the World | Alpine Species | CITES Appendix | Contact Gardens |
|---|--|-----------------------------|-----------------------|--------------------|---------|------------------|----------|-----|---------------------|----------------|----------------|-----------------|
| 1 | <i>Pyrus korshinskyi</i> | 6 | Critically Endangered | Endangered | Look Up | Search | Look Up | ✓ | Look Up | Look Up | | Send Request |
| 2 | <i>Pyrus korshinskyi</i> subsp. <i>buthanica</i> | 1 | - | - | Look Up | Search | Look Up | ✓ | Look Up | Look Up | | Send Request |

The interface also includes a search form with fields for Genus (Pyrus), Species (korshinskyi), and Epithet. There are also checkboxes for various categories like Medicinal plants, New Zealand threatened plants, Mexican threatened plants, CITES list, TCD list, and GTC list. A 'Search Plants' button is located at the bottom right of the search form.

At the global as well as at the national level, BGCI's PlantSearch database provides a monitoring and evaluation tool towards the achievement of Target 8 of the Global Strategy for Plan Conservation (GSPC) under the Convention on Biological Diversity (CBD). Adopted by the Parties to the CBD in 2002, Target 8 of the GSPC calls for *at least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes by 2020* (CBD, 2010). BGCI calls on botanic gardens and other institutions with *ex situ*

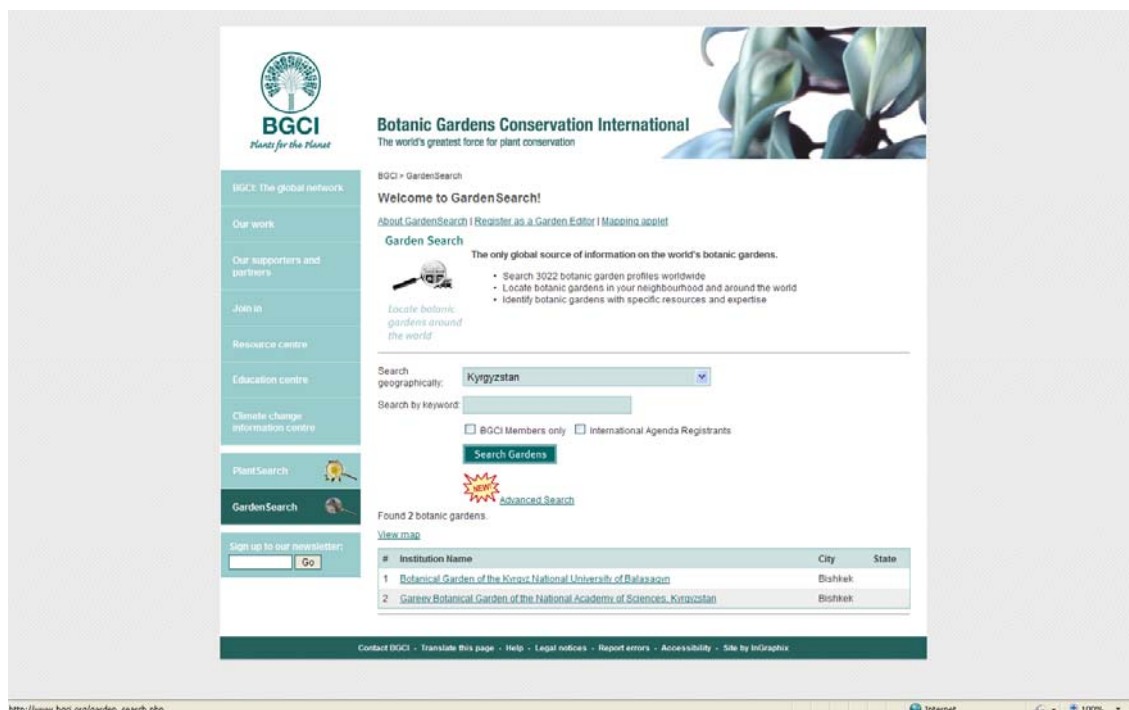
conservation collections to make related data available in PlantSearch and provide periodical updates. In turn, this will allow to establish a representative global analysis and perspective pertaining to *ex situ* collection objectives set by the international biodiversity conservation community.

Presently, PlantSearch is the only comprehensive global database of wild plant species in *ex situ* collections. As such it complements information of other databases on plants held in *ex situ* collections including information on crop varieties maintained for instance by the institutions affiliated with the Consultative Group on International Agricultural Research.

▪ GardenSearch

All plant records in PlantSearch supplied by botanic gardens are linked to the provider's own institutional records in BGCI's GardenSearch database. This global database contains information accessible online on over 2,600 botanic gardens around the world including two botanic gardens in Kyrgyzstan (**Figure 3**). Presently, it represents the only global repository of botanic garden resources and expertise.

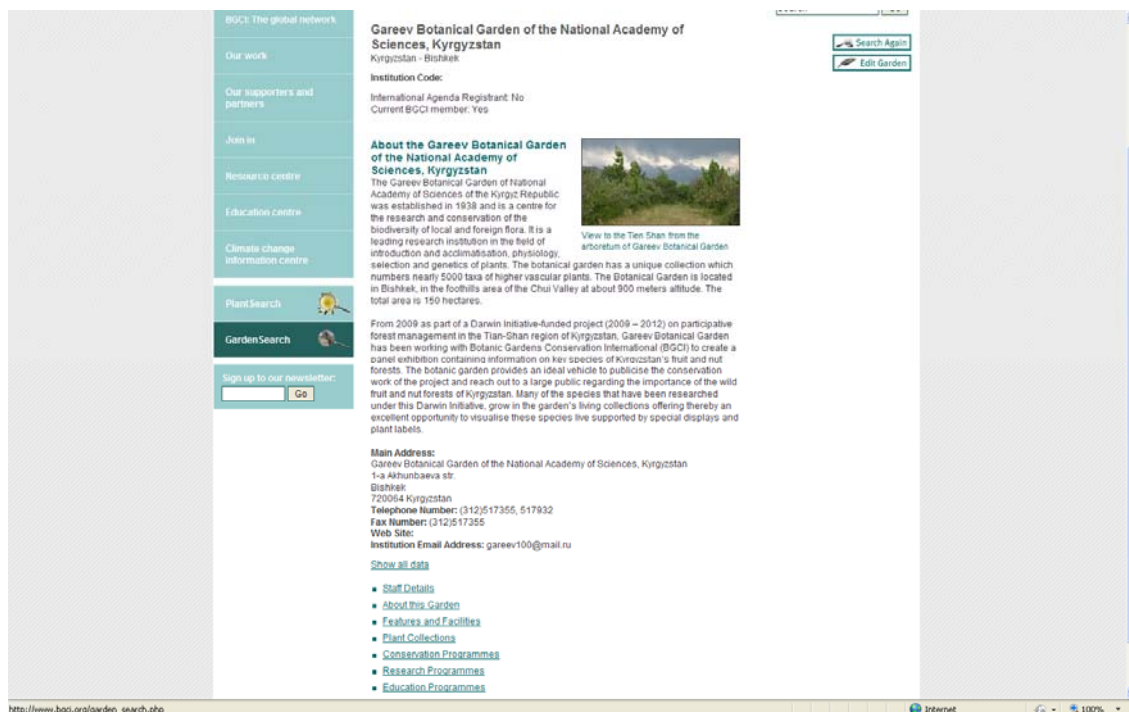
Figure 3: BGCI's GardenSearch database – Botanic gardens in Kyrgyzstan



As with PlantSearch, gardens are able to add and update their own information online. This includes a description of the garden, staff numbers, features and facilities, and details about their conservation and research programmes (**Figure 4**). All garden records

include latitude and longitude information, allowing locations to be mapped using web-based mapping tools. While originally intended to act as a contact directory, the added value of GardenSearch lies in its ability to capture relevant information on resources and expertise for a wide audience including conservation practitioners, policy makers, and botanic garden staff alike.

Figure 4: BGCI's GardenSearch – Garden profile of Gareev Botanical Garden, NASKR



As all garden records and associated plant lists are geo-referenced, the combination of PlantSearch and GardenSearch offers a practical tool to explore the geographical locations in which any particular species is in cultivation, and through links with other databases, such as the Global Biodiversity Information Facility, how these relate to the natural distribution of a species. Information on the range of environments a species can grow in is essential in developing an understanding of the 'plasticity' of a species and its potential to adapt to climate change.

3.2 Environmental education and public outreach

The Kyrgyz *Biodiversity Strategy and Action Plan* issued by Ministry of Environmental Protection in 1998 highlighted the limited awareness of Kyrgyzstan's biodiversity conservation challenges within the wider public and the absence of an overall plan to enhance public outreach regarding environmental issues. Although major efforts have been made in recent years to advance environmental awareness, especially also through a growing number of non-governmental organizations and formal education institutions

(International Fund for Saving the Aral Sea *et al.*, 2007), there is still a major shortage in related personnel, as well as educational and outreach resources (State Agency on Environment Protection and Forestry, 2009).

3.2.1 Gareev Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic

Established in 1938 and named after the Tatar botanist Enver Z. Gareev, the botanic garden in the heart of the capital Bishkek originally served as a centre for research and conservation of the local flora as well as of exotic species. Over a total area of 150 hectares, the garden's and arboretum's collections hold some 5000 taxa of higher, vascular plants. Comprising a large area with fruit tree cultivars, in particular apples, pears and plums, there are also a number of crop wild relatives including *Malus niedzwetzkyana*, *M. sieversii*, *Armenica vulgaris* and *Prunus sogdiana*.

Besides horticultural challenges, there is a need to enhance the garden's potential for public outreach and environmental education informed by an overall collections policy and management strategy. In collaboration with BGCI, a number of activities aiming to strengthen public outreach and capacity of staff at Gareev Botanical Garden, NASKR have been developed as part of the Darwin Initiative project funded by the United Kingdom's Department for Environment, Food and Rural Affairs. Promotional materials (**Annex 5 and 6**) as well as an interpretational display exhibit about Kyrgyzstan's fruit and nut forests have been established. Including eight species-specific panels and one display describing the conservation goals of this initiative, the exhibit provides information on the species' use, distribution and conservation status, in three languages, Kyrgyz, Russian and English (**Annexes 7 – 15**). Aimed at the wider public, this permanent display at the botanic garden provides an ideal vehicle for public outreach in an urban centre of over 900,000 dwellers. Many of the species that have been researched under this Darwin Initiative, grow in the garden's living collections offering thereby an excellent opportunity to visualise these species live supported by special displays and plant labels.

The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes is also a major objective of the Convention on Biological Diversity as referred to in Target 14 of the Global Strategy for Plant Conservation. To work towards the implementation of this objective, Botanic Gardens Conservation International and Royal Botanic Gardens, Kew, United Kingdom, are offering a number of international training opportunities specifically related to education and management challenges in botanic gardens. This Darwin Initiative has also facilitated the attendance of personnel from Gareev Botanical Garden to these courses that aim to equip participants with the necessary management and education skills and strategies to communicate effectively to their varied audiences.

4. Conclusions

As elsewhere in the world, wild plants maintained in Kyrgyz botanic gardens and affiliated institutions play an important role in conservation. However, in order to assess the extent and viability of these *ex situ* conservation collections (for example for *in situ* species recovery and ecosystem restoration programmes), a detailed assessment of their genetic diversity and representativeness would need to be undertaken which was beyond the scope of this study. Development of an *ex situ* conservation policy in relation to in the near-future likely available resources, is vital to establishing collections' management approaches appropriate to ensure their research and conservation value in the long-term. National coordination of *ex situ* conservation policies and priorities of all living collections and germplasm banks and related new initiatives, is another critical step to enhance and advance the importance of the collections.

The scope to strengthen the garden's potential for public outreach and environmental education informed by an overall collections policy, remains tremendous. Even plant collections constraint by limited documentation and genetic diversity, as well as the botanic garden venue itself are a vital, yet underutilised resource and opportunity to influence public attitudes towards biodiversity conservation. In Kyrgyzstan, where biological and in particular plant resources are closely linked to culture, customs and the economy, botanic gardens are ideally placed to remind all sectors of society of the relevance of the plant kingdom as the foundation of life.

Growing the wild in gardens may hold an alternative pathway to raise a growing mind that cares for the safeguard of our natural wealth.

Acknowledgements

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Conserving Eden:

Participatory forest management in the Tien Shan region of Kyrgyzstan

The Republic of Kyrgyzstan lies at the very heart of a biodiversity hotspot of international importance: the Mountains of Central Asia. Spanning an area of 860,000 km², these include two of Asia's major mountain ranges, the Pamir and the Tien Shan. Broadleaved forests predominantly composed of walnut trees (*Juglans regia*) form a particular natural characteristic of the varied ecosystems of Kyrgyzstan's Tien Shan region. Growing above the steppe zone in warmer, sheltered areas, these forests bear a remarkable botanical wealth including a number of other fruit and nut producing trees and shrubs such as species of apples, pears, cherries, plums, apricots and almonds.

A threatened botanical wealth vital to sustaining livelihoods of rural communities

The wild fruit and nut tree forests have always been of central importance to the livelihoods of the people living in the region be it as a source of firewood, timber or food. They also provide grazing grounds for livestock, and the understorey of wood pastures is cut for hay. Although an important source of income for rural communities, unsustainable rates of harvesting pose a tremendous threat to the forests. Unregulated logging, grazing and pests put long-established ecosystem functions and services further at risk. More than 50% of this forest habitat has been lost in recent decades. The Red List of Trees of Central Asia (2009) identifies more than 40 tree species including a number of wild fruit and nut bearing trees and shrubs as globally threatened with extinction.

The project

Launched in 2009, this project funded by the Darwin Initiative addresses the critical and acute decline of Kyrgyzstan's native broadleaved forests. It builds on the expertise and experience of a wide range of international and local partners to strengthen capacity for participatory forest management.

Specifically, the project contributes to:

- **Institutional strengthening** of participating local partners through the provision of research equipment and technical assistance.
- **Training** for project personnel and local stakeholders in-country and abroad in research and survey methods, participatory management approaches, and the production of management plans and best practice guidelines.
- **Research** on the distribution and conservation status of wild fruit and nut trees, and the socio-economic significance derived from these for local communities living in the project pilot sites.
- **Public outreach** to raise environmental awareness such as through the production of educational and interpretational materials at Gareev Botanical Garden, Bishkek, and locally in the project pilot sites, or the establishment of tree nurseries of target species at local schools.



The role of Gareev Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic

Established in 1938 and named after the Tatar botanist Erver Z. Gareev, the 150 hectare botanical garden located in the capital Bishkek is part of the National Academy of Sciences of the Republic of Kyrgyzstan. A major Kyrgyz institution in research and conservation, the garden is also central for education and public outreach to raise awareness of the critical importance to secure Central Asia's botanical heritage for future generations.

A major wealth lies in the garden's collections holding more than 5000 taxa of higher vascular plants. These include a number of native fruit and nut trees and shrubs such as apples (e.g. *Malus niedzwetzkyana*, *M. sieversii*), walnuts (e.g. *Juglans regia*), apricots (e.g. *Armeniaca vulgaris*), plums (e.g. *Prunus sogdiana*) and vines (e.g. *Vitis usunachmatica*).

Botanic Gardens Conservation International (BGCI)

BGCI – the world's largest network of botanical institutions for the conservation of plant diversity – works directly with the Gareev Botanical Garden to enhance the value of the garden's living collections and promote its significance for ex situ conservation and in situ recovery programmes as well as for public outreach.

Specifically, the programme of work includes the:

- Review and update of the garden's records contained in BGCI's global databases (BGCI *Garden* and *PlantSearch*).
- Development of interpretational resources at the garden linking living collection displays and project activities in situ to raise awareness about wild fruit and nut tree species and forests.
- Capacity building of botanic garden staff and other relevant project stakeholders in environmental education and interpretation.
- Support to environmental education and conservation programmes of local project partners in selected study areas.

The project and the Convention on Biological Diversity (CBD)

The project directly contributes to the implementation of the Global Strategy for Plant Conservation (GSPC) under the Convention on Biological Diversity (CBD). This demonstrates clearly the commitment of the Kyrgyz Republic to achieve internationally agreed biodiversity conservation targets.



For further information visit:

www.bgci.org

Botanic Gardens Conservation International



Botanic Gardens Conservation International (BGCI)

BGCI – the world's largest network of botanic institutions for the conservation of plant diversity – is working directly with the Ganev Botanical Garden to enhance the value of the garden's living collections and promote its significance for *ex situ* conservation and recovery programmes *in situ* as well as for public outreach.

Specifically, the programme of work includes:

- Review and update the garden's records contained in BGCI's global databases (GardenSearch and PlantSearch);
- Development of inter-institutional resources at the garden linking living collection specimens with project activities *in situ* to raise awareness about the importance of wild fruit and nut trees;
- Capacity building of botanic garden staff and other relevant project stakeholders in environmental education and interpretation focussing on conservation themes related to the management of fruit and nut tree forests;
- Support to environmental education and conservation programmes of local project partners in selected study areas.

The project's activities are well-aligned with the aims and objectives of the Global Strategy for Plant Conservation (GSPC) under the Convention on Biological Diversity (CBD). Its implementation represents an excellent opportunity for the government of Kyrgyzstan to highlight its action in support of native plant conservation found in its unique fruit and nut tree forests.

For further information about this project contact:

| | |
|--|---|
| <p>In Kyrgyzstan: Dr Kaley Arslanbek Rapoport, Director Senior Botanical Curator of the National Academy of Sciences of the Kyrgyz Republic 1A, Novosvetla Street, 720054 Bishkek Email: kaley@100@mail.ru</p> <p>Dr Almar Ozdombekov, In-Country Coordinator Kyrgyz National Agrarian University 28, Mikhovoy Street, Room 125 722005 Bishkek Email: ozdombekov@knanu.kg alyalod.com</p> | <p>In the United Kingdom: Joachim Graf, PhD, Director Regional Programmes Botanic Gardens Conservation International (BGCI) Deodar Road, 199 Kew Road, Richmond, Surrey, TW9 3EJ Email: joachim.graf@bgci.org</p> <p>Prof Adrian Newton, Overall Project Coordinator School of Conservation Sciences, Bournemouth University Talent Campus, Fern Barrow Poole, Dorset, BH12 5BB Email: anewton@bournemouth.ac.uk</p> |
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The Ganev Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic

Established in 1958 and named after the Tatar botanist Ermer Ganev, the 150-hectare botanical garden is located in the capital Bishkek and is part of the National Academy of Sciences of the Republic of Kyrgyzstan. A major Kyrgyz institution in plant diversity research and conservation, the garden is also a centre for education and public outreach to raise awareness of the critical importance of Central Asia's botanical heritage. In a city of over one million inhabitants, the Ganev Botanical Garden offers tremendous outreach potential and provides an ideal place to translate research findings into accessible information for local communities.

A major wealth lies in the garden's collections holding more than 5000 taxa of higher vascular plants. These include a number of native fruit and nut trees and shrubs such as apples (e.g. *Malus niedzwetzkyana*, *M. sieversii*), walnuts (e.g. *Juglans regia*), apricots (e.g. *Amrericia vulgaris*), plums (e.g. *Prunus sogdiana*) and vines (e.g. *Vitis ussuriatica*).



View to Tien Shan mountain range from Ganev Botanical Garden

Cover image: Tea, Collection of herbarium Bary Chalik

Bottom: Rosehip wild apricot (*Amrericia vulgaris*) near Arslanbek



Conserving Eden:

Participatory forest management in the Tien Shan region of Kyrgyzstan



The wild fruit and nut tree forests of Tien Shan



Kyrgyzstan lies at the heart of an internationally renowned biodiversity hotspot formed by the mountains of Central Asia. In the Tien Shan region of Kyrgyzstan, broad-leaved forests dominated by walnuts occur. These forests are a storehouse of genetic wealth with a uniquely high diversity of wild edible fruit and nut species including apples, pears, cherries, plums, apricots and almonds to name a few. They have played an extraordinary role in human history and culture, dispersing along the Silk Road in antiquity and providing the origin of many of today's most popular cultivated fruits. As sources of firewood, timber, food and livelihoods the forests remain of vital importance to the people living in the region.

However, the fruit and nut forests of Kyrgyzstan have declined by 50% in this region over the last 50 years and now cover less than 5% of their original range. The remaining forests are increasingly degraded, primarily as a result of unsustainable land use practices. 44 endemic species – including many wild fruit and nut producing species – are threatened with extinction (Red List of Trees of Central Asia, 2009). Present rapid decline in the volume of fruits and nuts available for harvesting is also threatening the livelihoods of local communities, some 80% of whom exist below the poverty line.



The project

A three year project funded by the Darwin Initiative is aiming to address forest decline by drawing together international partners to strengthen capacity for the participatory management of the forests in Tien Shan and the promotion of sustainable harvesting practices.

The project works to identify harvesting thresholds and approaches to grazing management that are sustainable, reduce rates of forest loss and degradation and reduce the extinction risk of tree species, while supporting the improvement of local livelihoods.

Top left: View to walnut forests (Kara Arslan), above left: Apple orchard (Jalil) south of Ganev Botanical Garden, above right: Plum species (*Prunus sogdiana*) at Ganev Botanical Garden, top right: Apple plants (*Malus niedzwetzkyana*) growing on a steeply sloping hillside

It will do this via:

- **Institutional strengthening** of local project partners, including the purchase of equipment, technical assistance and information exchange.
- **Training** for local stakeholders in research and survey methods, participatory management approaches and the production of best practice guidelines.
- **Research surveys** on the distribution and status of threatened fruit and nut trees and socio-economic surveys focusing on how local people use the forests and the values derived from them.
- **Outreach** to raise awareness including environmental education and interpretation at Ganev Botanical Garden, the establishment of five nurseries of threatened species at local schools and the development of participatory management plans at pilot sites.



Darwin Initiative – Project panel

БИРИШ БАГЫН САКОО

Кыргызстандын Тянь-Шань регионундагы токойлорду биргелешип сактоо. Кыргызстандын жаңгак токойлору дүйнөдөгү эң чоң токойлордун бири. Бул жерде Тянь-Шань регионунун кайталангыш ландшафты түзгөн кызыл карыган дарактар табигый түрдө сакталып калган. Жаңгак токойлору биологиялык түптү сактоодо зор мааниге ээ: бул жерде жаяктын, алмуруттун, алычанын, алманын азыркы жаңы сортторун чыгарууда пайдаланылган жанын тургору өсөт. Бул жапалы түрдөй орота жана зынкенегере, курпан турган чөйрөгө жана климаттын өзгөрүшүнө турутуу жаңы сортторду чыгарууда эң маанилүү генотип болуп саналат. Мындай биологиялык ар түрдүүлүк бул регионго «Бейки багы» деген ата-арасына шарт түзгөн.

Бирок азыркы жылдарда Кыргызстандын жаңгак токойлору 50% га чейин кыскарып кеткен, башы себеби болуп – жерди рационалдуу эмес пайдалануу болуп саналат. Мындай кыскарууну кесепети болуп табигый маани чөйрө өзгөрүп, оорулар жана зынкенелер көбөйгөн. Ошондуктан бул проблеманы чечүү үчүн Кыргызстандын жана Улуу Британиянын жаратылышты коргоо уюмдары биргеликте иш алып барууда. Мындай иштердинти Улуу Британиянын айлана-чөйрө, азык түтүк жана азык чарба Департаментинин «Дарын демилгеси» программасынын алкагында колдоо көрсөтүлүр. Бул иштердинти Кыргызстан тараптан – НПО «Биоресурс», Ош Технолология Университети, К.И.Скрябин атындагы Кыргыз Улуттук Агрария Университети жана УИАнын Э. Гарева атындагы Ботаника багы катышууда. Бул долбоор Борнмут Университети (Улуу Британия) Эл аралык фауна жана флораны коргоо коому – «Фауна жана Флора Интернэшнл» (FFI), Улуу Британия) жана өсүмдүктөрдү коргоо боюнча Эл аралык Ботаника Бактарынын Кеңеши (BGCI) менен кызматташтыкта башкарылат.

Бул стандартта Улуттук илимдер академиясынын Э. Гарева атындагы Ботаника багы жана өсүмдүктөрдү коргоо боюнча Ботаника бактардын Эл аралык Кеңешинин Бирдикте Кыргызстандын жаңгак токойлорунун улуттук жана Эл аралык мааниси туралуу маалымат берилүүптүн. Ботаника бактары өсүмдүктөрдү маданий өсүмдүк сактоочу чөйрөгө борбору болуп саналат, ал эми бул долбоордун алкагында изилденген өсүмдүктөрдү өсүү Ботаника бакында өстүрүлөт, кызыккан адамдарга алар менен жакындан танышуу мүмкүнчүлүгү бар.

СОХРАНИЯ ЭДЕМ

Орекоплодовые леса Кыргызстана являются самой большой территорией в мире, где в естественном состоянии сохранились многовековые деревья, что формирует неповторимый ландшафт Тянь-Шаньского региона. Орекоплодовые леса имеют огромное значение для сохранения биоразнообразия: здесь произрастают дикие сорродичи современных культурных сортов ореха, яблони, груши, сливы. Они представляют жизненно важный генотип для создания новых сортов, более адаптированных к изменениям окружающей среды и климата, устойчивых к вредителям и болезням. Такое биологическое изобилие дало региону одно из общезвестных названий – Райский сад.

Но за последние десятилетия орекоплодовые леса Кыргызстана уменьшились более, чем на 50%, главным образом в результате нерационального использования земель, что привело к изменению естественной среды обитания, повлекло вырубку и болезни. Поэтому основные природоохранные организации Кыргызстана и Великобритании объединились для решения данной проблемы. Это партнерство поддержал Департамент окружающей среды, продовольствия и сельского хозяйства Великобритании в рамках своей программы «Дарин инициатива», подразумевающей совместное управление для дальнейшей защиты орекоплодовых лесов. В проекте задействованы ведущий партнер в Кыргызстане – НПО «Биоресурс», а также Ошский Технологический Университет, КИУ им. К.И.Скрябина и ряд других национальных институтов, включая Ботанический сад им. Э.Гарева НАН КР. Проект координируется Университетом Борнмута (Великобритания) в сотрудничестве с Международным обществом охраны фауны и флоры «Фауна и Флора Интернэшнл» (FFI, Великобритания) и Международным Советом Ботанических садов по охране растений «Garden of Eden».

Ботанический сад им. Э.Гарева НАН КР и Международный Совет Ботанических садов по охране растений предоставляют вниманию посетителей сада стенды с информацией о национальном и международном значении орекоплодовых лесов Кыргызстана. Ботанические сады являются основными центрами сохранения растений в культуре (ex situ), а многие виды, исследованные в рамках проекта, произрастают в Ботаническом саду им. Э.Гарева НАН КР, что дает прекрасную возможность посетителям увидеть здесь эти растения.

CONSERVING EDEN: PARTICIPATORY FOREST MANAGEMENT IN THE TIAN-SHAN REGION OF KYRGYZSTAN

The fruit and nut forests of Kyrgyzstan are the world's biggest remaining areas of this ancient forest formation and present a unique landscape feature of the Tian-Shan region. They are of global importance for biodiversity conservation as many of the fruit and nut bearing trees growing in these forests are the wild relatives of our present day crops, such as the walnut, apple, pear and plum trees. This biological wealth has earned the region its proverbial name: "Garden of Eden".

However, the fruit and nut forests of Kyrgyzstan have declined by over 50% in recent decades, mostly as the result of unsustainable land use practices, habitat loss, introduction of pests, diseases and overharvesting. This is why major conservation stakeholders in Kyrgyzstan and the United Kingdom (UK) have formed a partnership supported by the UK Department for Environment, Food and Rural Affairs (Darwin Initiative) to support the development of participatory management approaches towards the safeguard of Kyrgyzstan's fruit and nut forests.

Working with the main Kyrgyz partners BioResources (NGO), Kyrgyz National Agrarian University, Osh Technological University and Gareev Botanical Garden of the Kyrgyz National Academy of Sciences, as well as a number of other national institutions, this project was coordinated by Bornmuth University (UK) in collaboration with the UK-based conservation organisations Fauna&Flora International (FFI) and Botanic Gardens Conservation International (BGCI).

Gareev Botanical Garden and BGCI have established a panel exhibition containing information on key species of Kyrgyzstan's fruit and nut forests. As a major centre for ex situ conservation, research and public outreach, Gareev Botanical Garden not only provides an opportunity to learn more about these species, but also offers a great chance for visitors to experience these plants first hand.

Annex 8

Walnut panel

ГРЕК ЖАНГАГЫ
(*Juglans regia*)

Грек жангагы Уруу: Жаңгактар (Juglandaceae)

Жаңгак жергиликтүү калк үчүн кирешени булагы болуп жетелет. Түшүм мол болгон жылдары ал үй-бүлө кирешесинин 50 пайызын түзөт.

Кыргыз Республикасынын территориясында дүйнөдөгү эң ири жаңгак токою жайгашкан. Ал токойдо жаңгак менен бирге жапалы алма, алмурут, балдыр ж.б.ө.т. Бул токою жаңгак токойлору эң ири деп эсептелет. 800м деңгээлден 2300м ге чейинки бийиктикте Фергана, Чыгач, Гассар тоо кыркаларынын түштүк беттеринде жайгашкан. Бул токойлар маанилүү генетикалык ресурс болуп эсептелет, бирок азыркы убакта климаттын өзгөрүшү жана адам баласынын ишмердүүлүгүнүн натыйжасында көптөгөн өзгөрүүлөргө учурадоо.

Мондгон жылдардан бери грек жаңгактын тамак-аш жана дарылык касиети бааланган келүүдө. Медициналык изилдөөлөр көрсөткөнчө, жаңгакты ар дайым пайдалануу адамдын ан-сезиминин жакшырышына жакшы шарт түзөт. Тарыхта Александр Македонский жаңгакты Борбордук Азиядан Грецияга алып келип, анын Европага жайылышына себептер болгону айтылат.

Жаңгактын таралган жерин картада көрсөтүлгөн. Стратегиянын авторлору: FFI (Жейсон Смит), BGCI (Иоахим Гратцфельд)

Орех грецкий Семейство: Ореховые (Juglandaceae)

Грецкий орех приносит людям значительный доход: в урожайные годы они могут давать до 50 % семейного бюджета в зоне орекоплодовых лесов Кыргызстана.

Кыргызская Республика имеет крупнейшие ореховые леса в мире. Вместе с орехом произрастают дикие виды плодовых: яблоня, груша, слива, миндаль и др. Орекоплодовые леса распространены по склонам Ферганского, Чыгачского и Гассарского хребтов на высотах от 800 до 2300 м. Эти леса являются важнейшим генетическим ресурсом. Однако они находятся под сильным давлением человеческой деятельности (перегулауремой сбор плодов, выпас скота и т. д.) и измененный климата.

На протяжении тысячелетий грецкий орех ценится за пищевые и лекарственные свойства. Медицинские исследования показали, что регулярное употребление орехов улучшает умственную деятельность человека. Считается, что Александр Македонский привез плоды ореха (грецкого из Центральной Азии) в Грецию, что вышло началом интродукции этого растения в Европу.

Места произрастания грецкого ореха обозначены на карте КР. Фото: FFI (Жейсон Смит), BGCI (Иоахим Гратцфельд)

Walnut Scientific name: *Juglans regia*; Family: Juglandaceae

Walnuts make a significant contribution to people's livelihoods: in a good harvest year, walnuts can account for 50% and more of a family's annual cash income in rural areas of Kyrgyzstan.

The Kyrgyz Republic has the largest walnut forests in the world. Walnut-dominated forests are located primarily on the southern slopes of the Fergana, Chigach and Gassar ranges of the Tian-Shan at 800-2300m above sea level. Walnut-dominated forests form a varied landscape with a mosaic of forest stands, fields and pastures. A number of other important fruit and nut producing trees grow in these forests, including different species of apple, pear and plum. These forests are an important genetic resource of global significance. However, they are under strong pressure from human exploitation, grazing and changing climatic conditions.

Over millennia, people have valued the walnut for its nutritional and medicinal virtues. Medical research has shown that regular walnut consumption is good for health and it is believed that it can improve cognitive performance. The walnut tree is also highly sought after for its attractive and durable timber. Alexander the Great is said to have brought the walnut from Central Asia to Greece, thereby initiating its introduction to wider Europe.

The map shows the distribution of walnut in the country. Photos: FFI (Jason Smith), BGCI (Joachim Gratzfeld)

АЛМА

(*Malus spp.*)







Алма

Уруу: Роза гүлдүүлөр (Rosaceae)

Биз күнгө чейин ботаниктердин аркасында алманын маданий түрүнүнүн жашай алмадан келип чыгышы жөнүндө ыктуу галандар тартыптан болуп келүүдө. Алма жер жүзүнүн суук жаан мелүүн климаты болуучу эки мезгилде манаптуу мөмө багы болуп эсептелет жана бул региондордо алмадан 63 миллион тонна тушум жылына чогултулат. Борбордук Азиянын мөмө-жемиш токойлору, анын ичинде Кыргызстандын территориясында жайгашкан токойлор жашай алманын көп түрлүүлүгүнүн бөрбөрү экендигин тастыктоого кажет эмес. Ошондуктан бул токойлорду коргоо

Борбордук Азиядагы түсү, формасы, коюму, даамы боюнча айырмаланган көп түрдүү алманын формалары келечек муун үчүн сактоо болуп эсептелет. Кыргызстанда өскөн Сиверс жана Недзвецкий алмалары республиканын Кызыл Китебине киргизилген (2006 ж.) ал эми Сиверс алмасы эл аралык Кызыл Китепте да бар.

Алманын таралган жерлери картада көрсөтүлгөн. Сүрөттөрдүн авторлору: ЮР "Биоресурс" (Кайыркул Шалпыков); Георгий Лазков

Яблоня

Семейство: Розоцветные (Rosaceae)

До сих пор предметом жаргых споров среди ботаников является происхождение от дикого предка яблони ее широко культивируемых сегодня видов и бесчисленных разновидностей. Яблоня является одной из наиболее важных фруктовых культур холодных и умеренных частей света и дает в этих регионах 63 миллиона тонн продукции ежегодно.

Каждый согласится с тем, что ореоловые леса Центральной Азии (в частности той части Тянь-Шаня, которая находится на территории Кыргызстана) являются центром разнообразия дикорастущих яблонь. Поэтому сохранение этих лесов будет важным вкладом в сохранение исстариного изобилия яблос Центральной Азии, отличающихся по цвету, форме, размеру, вкусу, текстуре, для будущих поколений.

Прораставшие в Кыргызстане яблоня Сиверса (*Malus sieversii* (Ldb.) M. Roem.) и яблоня Недзвецкого (*Malus niedzwetzkyana* Dieck) внесены в Красную Книгу республики (2006 г.), а яблоня Сиверса – также в Международную Красную Книгу.

Места прорастания яблони обозначены на карте КР. Фото: ОФ "Биоресурс" (Кайыркул Шалпыков); Георгий Лазков

Wild Apple

Scientific name: *Malus spp.*; Family: Rosaceae

"The apple does not fall far from the tree"...

This old proverb also illustrates the complex evolutionary origin of the apple. The relationship of the wild parent apple and today's widely cultivated species and innumerable varieties is still a topic of much passionate discussion in the botanical community.


What everyone does agree on though is that the fruit and nut forests of Central Asia, in particular in Kyrgyzstan's Tian-Shan, represent a centre of wild apple diversity. Conserving these forests will therefore make a significant contribution to secure this overwhelming wealth in colour, form, size, taste and texture of Central Asian apples for future generations.




Malus sieversii (Ldb.) M. Roem. and *Malus niedzwetzkyana* Dieck are native to Kyrgyzstan. Both species are listed in the Red Book of Kyrgyzstan (2006) and the IUCN Red List of Threatened Species.

The map shows the distribution of wild apple in the country. Photos: NGO "BioResources" (Kairkul Shalpykov); Georgi Lazkov

АЛМУРУТ

(*Pyrus spp.*)



Алмурут

Уруу: Роза гүлдүүлөр (Rosaceae)

Алмурут байыркы өсүмдүктөрдүн катарына кирет. Биздин заманга чейин 800 жыл мурда жашаган грек жазуучусу Гомер өзүнүн "Одиссея" чыгармасында алмурутту "эрдийин белеги" деп белгилетет.

Дүйнөдө алмуруттун 60 түрү бар, алардын ичинен Кыргызстанда 3 түрү өсөт: Орто Азия алмуруту (*Pyrus asiatica* Malcev), Коржинский алмуруту (*Pyrus korshinskyi* Litv.), Регель алмуруту (*Pyrus regelii* Rehd.) Мөмө-жемиш токойлорунун жергиликтүү түрүндөр тарбиялан кыйылуусу жана мал жалдуулук себебинен, жашай алмурут Тянь-Шань токойлорунда сейрек кездешүүчү өсүмдүк катарына кирет калат.

Алмуруттун таралган жерлери картада көрсөтүлгөн. Сүрөттөрдүн автору: Георгий Лазков.

Груша

Семейство: Розоцветные (Rosaceae)

Груши являются одной из старейших фруктовых культур в мире. Древнегреческий поэт Гомер, который жил 800 лет до нашей эры, в своем произведении «Одиссея» называет груши «подарком богов».

В мире около 60 видов груш, из которых в Кыргызстане произрастают 3 вида: груша Средней Азии (*Pyrus asiatica* Malcev), груша Коржинского (*Pyrus korshinskyi* Litv.), груша Регеля (*Pyrus regelii* Rehd.). Вырубка и неумеренный выпас скота способствовали тому, что дикая груша стала редким деревом в ореоловых лесах Тянь-Шаня.

Места прорастания груши обозначены на карте КР. Фото: Георгий Лазков.

Wild Pear

Scientific name: *Pyrus spp.*; Family: Rosaceae

"You cannot compare apples with pears"...

Well, actually you can, to gainsay this old saying. Pears and apples are relatives – both belong to the rose family (Rosaceae). And, as with apples, pears are among the oldest of the world's fruit crops. In his "Odyssey", Homer, the ancient Greek epic poet who lived around 800 B.C. calls the pear "gift of the gods".

Worldwide, some 60 species of pears are known, of which 3 are found in Kyrgyzstan (*Pyrus korshinskyi* Litv., *P. regelii* Rehd. and *P. asiatica* Malcev). Loss of habitat, cutting and overgrazing have contributed to making the wild pear a rare tree occurring now and then in the walnut-dominated forests of the Tian-Shan.

The map shows the distribution of wild pear in the country. Photos: Georgi Lazkov

КАРА ӨРҮК

(Prunus sogdiana)







Кара өрүк

Уруу: Роза гүлдүүсөр (Rosaceae)

Кара өрүк атын Борбордук Азиядагы байыркы согдий цивилизациясынан алган. Согдийликтер биздин эрвни 6-8 кылымдарында Жамбыл Чыгыш жеткен Кытайдын ортоңуна улуу Жибек-Жибек жолу аркылуу соода жүргүзүшкөн. Согдий жары өрүкү (алыча) Тянь-Шань тоолорунда кеңири таралган, ал уругу менен оңой көбөйүп, экономикалык маанилүү түр болуп саналат.

Кара өрүк жер шарынын түндүк мелүүн областарында таралган. Бул түрүн мөмөсүнөн тамак-аш азыктары жасалат, ошондой эле ал декоративдүү өсүмдүк.

Кара өрүктүн таралган жерлери картала көрсөтүлгөн. Сүрөттөлүшү авторлору: КНАУ (Алмаз Орозумбеков); BGC1 (Иоахим Граффелд)

Слива согдийская

Семейство: Розоцветные (Rosaceae)

Слива полуцифра свое название от древней согдийской цивилизации Центральной Азии. Считается, что согдийцы были опытными торговцами на Шелковом пути между Ближним Востоком и Китаем с VI по VIII вв. нашей эры. Слива согдийская широко распространена в лесах Тянь-Шаня, легко размножается семенами и относится к экономически важным видам.

Большинство видов сливы разбросаны по всем северным умеренным областям Земного шара. Этот род включает виды, которые высоко ценятся за плоды, из которых варят джемы и употребляют в сушеном виде. Сливы также применяются как декоративные растения и идут на провясану.

Места произрастания сливы согдийской обозначены на карте КР. Фото: КНАУ (Алмаз Орозумбеков); BGC1 (Иоахим Граффелд)

Wild Plum

Scientific name: Prunus sogdiana; Family: Rosaceae

The wild plum, Prunus sogdiana, owes its name to the ancient Sogdian civilisation of Central Asia. The Sogdians are said to have been skilled merchants controlling the Silk road trade between the Near East and China between the sixth and eighth century A.D.

This species is widely distributed in the forests of the Tian-Shan and propagates very easily from seed. Along with some 700 other species, Prunus sogdiana belongs to an economically important genus of deciduous and evergreen trees and shrubs. Most species are spread throughout the northern temperate regions of the globe. This genus also includes species highly appreciated for its fruit, used in the preparation of jams and dried fruit. Some species are also grown as ornamental trees, as well as for the production of timber.

The map shows the distribution of wild plum in the country. Photos: KNAU (Almaz Orozumbekov); BGC1 (Joachim Gratzfeld)

КАДИМКИ ӨРҮК

(Armeniaca vulgaris)







Кадимки өрүк

Уруу: Роза гүлдүүсөр (Rosaceae)

Кадимки өрүк ботаникалык аты "армен" атуу соддан (armeniaca) келип чыкканын карабай, анын коо бир түрлөрү Израил Чыгышта кездешет жана Кытайга 5000 жыл илгери белгилүү болгон.

Мелүүн климаттуу райондарда кадимки өрүктү өндүрүшүк негизде өстүрүү чектелүү болгондугуна карабастан, көптөгөн жергиликтүү сорттор калыңдардан бери ар кандай климаттык шарттарга ыңгайланган дүйнөнүн көп жерлерине тарган.

Кадимки өрүк Тянь-Шань тоолорунда да өсөт. Ал Борбордук Азияда жана Кыргызстанда эң белгилүү жемин болуп саналат. Аны жаны үрүн алып жана кургатып жешет, варенье кайнатышат. Жыгачы ар кандай үй эмеректерин жасоодо, өзгөчө кыргыздын белгилүү музыкалык аспабы-комузду чабууда колдонулат.

Armeniaca Vulgaris жок болуп өтүү коркунучунда турган түрү көрүн, ал аралык Кызыл Китепке киргизилген.

Абрикос обыкновенный

Семейство: Розоцветные (Rosaceae)

Несмотря на то, что ботаническое название абрикоса возникло от слова «армянский» (Armeniaca), некоторые виды абрикоса родом с Дальнего Востока и были известны в Китае около 5000 лет назад. Хотя промышленное выращивание абрикоса жестко ограничено в более холодных районах, на протяжении веков были выведены многие местные сорта, адаптированные к разнообразным климатическим условиям.

Абрикос обыкновенный произрастает в горах Тянь-Шаня. Абрикос является одним из самых популярных фруктов в Кыргызстане и Центральной Азии в целом. Его употребляют в свежем, сушеном виде, варят варенье. Абрикосовое дерево дает прекрасную древесину, используемую в изготовлении кухонной утвари и в других ремеслах. С этим видом связано и производство известного кыргызского музыкального струнного инструмента – комуз, который делают из цельного куска абрикосового или орехового дерева.

Armeniaca vulgaris включен в Международную Красную Книжку как находящийся под угрозой исчезновения вид, нуждающийся в защите в среде обитания дикорастущего абрикоса и бесконтрольные рубки.

Места произрастания абрикоса обыкновенного обозначены на карте КР. Фото: Александр Науменко; BGC1 (Иоахим Граффелд)

Wild Apricot

Scientific name: Armeniaca vulgaris; Family: Rosaceae

Even though its botanical name suggests origins in Armenia (Armeniaca vulgaris), the apricot originated in the Far East and was known in China some 5,000 years ago. Though commercial production of apricot is severely restricted in colder areas, many local cultivars have been developed over the centuries coping with varied climatic conditions.

Wild forms of apricot can be found in the mountains of the Tian-Shan. Apricot is one of the most popular fruits in Kyrgyzstan and Central Asia at large, consumed fresh, or more importantly, dried and in the form of jams. The apricot tree provides an excellent timber, used in the production of cooking utensils and crafts. This species is also closely associated with the famous Kyrgyz musical string instrument – the Komuz – with the main body being made from a single piece of apricot or walnut wood.

Armeniaca vulgaris has been included in the global IUCN Red List of Threatened Species as a species of conservation concern given growing pressure on the habitat of the wild apricot and indiscriminate cutting.

The map shows the distribution of wild apricot in the country. Photos: Alexander Naumenko; BGC1 (Joachim Gratzfeld)

БАДАМ

(Amygdalus spp.)







Бадам

Уруу: Роза гүлдүүлөр (Rosaceae)

Бадырм өсүмдүк (богосдуктан, бадамдын келип чыгышы узамистар менен айтмат. Азыркы убакта бадамдын жашып турары Батыш Тянь-Шаньдан кургакчыл райондорунда кездештирүүгө болот.

Бадамдын мөмөсүнүн ачуу, таттуулугуна карабай, ал дүйнө жүзүнүн жана Кыргызстандын көпүз көп калтырайт. Ошондой эле бадамды медицина жана косметикада колдонушат.

Азыркы жылдары бадамды коммерциялык багытта өстүрүү күчүн берет. Мисалы: Америкаан Калифорния штатында бир жылда 1,8 млн. тонна түшүм алынат. Бирок бул өндүрүштүн жарымы ыто көп ээс сортторду өстүрүүгө негизделген, ал эми сорттордун алдыгы заманбаптарга, ооруларга жана климаттын өзгөрүшүнө туруксуздукту алып келет.

Ошондуктан, азыркы бадым ири-аракеттер аны коргоо жана чон генетикалык ар түрдүүлүгүн сактоого жумалышы керек.

Бадамдын өскөн жерлери картада көрсөтүлгөн. Сүрөттүн автору: Советбек Кенжебаев

Миндаль

Семейство: Розоцветные (Rosaceae)

Как у многих диких соросатей современных широко культивируемых культур, происхождение миндаля окувано легендами. Сегодня диворастущие виды миндаля можно найти в засушливых районах Западного Тянь-Шаня.

Будь он сладкой или горькой, миндаль часто упоминается в фольклоре и вдохновляет кулинаров в Кыргызстане и во всем мире. Не менее важное значение он имеет в медицине и косметике.

Сегодня миндаль является одной из наиболее важных ореховых культур в мире. В последнее время коммерческое выращивание миндаля, объемом более 1,8 млн. тонн / год, осуществляется главным образом в Калифорнии (США). Тем не менее, почти половина производства основана на очень немногих сортах. Коммерческое выращивание, основанное всего на нескольких культурах, является рискованным, и делает садм уязвимым при поворедках вредителями и в изменяющихся условиях окружающей среды.

Поэтому важно, как и с любой другой культурой, направить усилия на защиту и сохранение огромного генетического разнообразия миндаля в полном объеме.

Места распространения миндаля обозначены на карте КР. Фото: Советбек Кенжебаев

Wild Almond

Scientific name: Amygdalus spp.; Family: Rosaceae

As with many wild relatives of nowadays widely cultivated crops, the origins of the almond are shrouded in legends and history. Today wild almond species and populations can be found in the drier areas of the western Tian-Shan region.

Be it sweet or bitter, the almond has inspired a wealth of folklore and culinary practices in Kyrgyzstan and worldwide. It also enjoys an equally important rank in medicine and cosmetics.

Today, the almond is one of the world's most important nut crops. In recent times, commercial almond cultivation amounted to over 1.8 million tons/year mainly grown in California, United States. However, almost half of the production is based on very few cultivars. The reliance on too a narrow range of cultivars for commercialisation is risky, making orchards prone to entire loss when faced with pests and changing environmental conditions.

As with any other crop species, it is therefore important that conservation efforts aim to safeguard the vast genetic diversity of the almond in its entirety.

The map shows the distribution of wild almond in the country. Photos: Sovetbek Kenzhebaev

ЖҮЗҮМ

(Vitis spp.)







Жүзүм

Уруу: жүзүм (Vitaceae)

Жүзүм өстүрүү жөнүндө маалымат тарыхта элестеден белгилүү, себеби жүзүм өстүрүү менен шарп жасоо жөнүндө мындан 6000 жыл өлгөрү байыркы Египетте айтылган.

Библияда айтылгандай, Ной пайгамбар Арарат тоосунда (Кавказ) жүзүм отургузуп, биринчиден болуп жүзүм бачкысын өстүргөн.

Жүзүм өстүрүү Борбордук Азияда, анын ичинде Кыргызстандын Фергана ороонунда элдин жашоосунда чоң роль ойногон. Бирок башка өлкөлөргө салыштырмалуу жүзүм өндүрүү тымонорук.

Жүзүм жана алдан өндүрүлгөн продукция (мейиз, шара, шарп) Кыргызстандын жашылча базарларында өзгөчө орунду ээлейт.

Улууамат жайып жүзүм (vitis uisnathomatica) Батыш Тянь-Шаньдан жангак токойлорунда өсөт. Бул чырмак жарылышта сейрек кездешкенден 2006-жылы Кыргызстандын Кызыл Китебинде киргизилген.

Жүзүмдүн таралган жерлери картада көрсөтүлгөн. Сүрөттөлүш авторлору: Нурлан Албанов, Георгий Лазков

Виноград

Семейство: Виноградовые (Vitaceae)

Истоки выращивания винограда теряются на заре истории. Виноград и виноделие были известны еще в Древнем Египте около 6000 лет назад. В Библии сказано, что Ной посадил виноградную лозу и выростил первый виноградник на горе Арарат (Кавказ), где его копчик, как говорится, сел на мель.

Виноградарство всегда было неотъемлемой частью жизни людей в Центральной Азии, особенно в плодородной Ферганской долине Кыргызстана. Хотя производство остается сравнительно низким (около 15000 тонн в 2007 году) по сравнению с другими странами. Виноград и продукты из него (вином, соком, вина) занимают значительное место на традиционных фруктово-овощных рынках Кыргызстана.

Дикий виноград узунхатматский (Vitis uisnathomatica) произрастает в орехово-лиственных лесах Западного Тянь-Шаня. Эта лозина редко встречается в природе и занесена в Красную Книгу Кыргызстана (2006 г.).

Места произрастания дикорастущего винограда обозначены на карте КР. Фото: Нурлан Албанов, Георгий Лазков

Wild Grape

Scientific name: Vitis spp.; Family: Vitaceae

The origins of the cultivation of vine are lost in the dawn of history. Grapes and wine production were known in ancient Egypt some 6,000 years ago. The Bible records that Noah planted the grape vine and tended the first vineyard on Mount Ararat (Caucasus) where his ark is said to have ran aground.

Viticulture has always been an essential part of the life of the people in Central Asia, especially in Kyrgyzstan's fertile Ferghana Valley. Though production remains relatively low (some 15,000 tons in 2007) compared to other countries, grape products – either fresh, dried or as fermented alcoholic drinks and wine – are an essential aspect of traditional Kyrgyz life.

The wild grape found in the fruit and nut forests of the western Tian-Shan is referred to as Uzum-Akmat grape (Vitis ussathomatica). As this climber is rarely encountered in the wild, it has been listed in the Red Book of Kyrgyzstan (2006).

The map shows the distribution of wild grape in the country. Photos: Nurlan Albanov; Georgi Larkov

АЛМА ЧЕТИН

(Sorbus persica)




Алма четин

Уруу: Роза гүлдүүлөр (Rosaceae)

Тундук жарым шардын мелүүн алкагында алма четиндин 100дөн түрү өсөт, мекени Борбордук Азия, Тянь-Шань тоолорунда таралган. Ал бадал же жапыз дарак түрүндө бийик тоолу, жогорку нымдуулуктагы жапыз жалбырактан жана арча токойлордо өсөт.

Минусу каротин жана витаминдерге бай келип, өтө пайдалуу, дамы кычкылдык. Шаптарынан боз үйдүн шаймандары жасалат. Алма четин жер шарынын мелүүн алкактарында жашылдандырууда юзлөнүлөт.

Сөбөсүз кылуучу токтогу жана кылуу максатында Sorbus persica 2006-жылы Кыргызстандын Кызыл Китебине кирген.

Алма четиндин таралган жери картада көрсөтүлгөн. Сүрөттөрдүн автору: Исабек Аमतов; А.Газиев





Рябина персидская

Семейство: Розоцветные (Rosaceae)

Оңкоо 100 висок рябины произрастают в умеренном поясе Северного полушария. Рябина персидская (Sorbus persica) родом из Центральной Азии. Распространена на Тянь-Шане. Это кустарник или дерево, растет в основном в подлеске лиственных и можжевеловых горных лесов в районах с высокой влажностью почвы. Рябина персидская не образует сплошных массивов, а встречается небольшими рощами или в виде отдельных деревьев.

Богатые витаминами и каротином, ягоды рябины очень полезны, хотя имеют кисло-сладкий, слегка вяжущий вкус. Рябиновые ветви часто используют для изготовления деревянных каркасов традиционных кыргызских юрт. Отмеченные во множестве местных традиций и обычаев, в последнее время, многие виды рябины используются также в качестве относительно быстро растущих декоративных деревьев в городских посадках умеренных широт мира.

Sorbus persica включена в Красную Книгу Кыргызстана (2006 г.) в связи с ростом давления на среду обитания этого вида и бесконтрольные рубки.

Места произрастания рябины персидской обозначены на карте КР. Фото: Исабек Аमतов; А.Газиев

Rowan / Mountain Ash

Scientific name: Sorbus persica; Family: Rosaceae

While there are some 100 Rowan or Mountain Ash species in the temperate zone of the Northern Hemisphere, the Persian Mountain Ash (Sorbus persica) is native to Central Asia. In the Tian-Shan mountain range, the shrub or tree mainly grows in the understorey of deciduous and juniper mountain forests in areas high in soil moisture. The Persian Mountain Ash does not form extensive stands, but occurs in small groves or as individual trees.

Rich in vitamins and carotenes, Sorbus berries are very healthy, though sour-sweet and slightly astringent. Rowan branches often provide the wooden frame of the traditional Kyrgyz yurt. Embedded in many local traditions and customs, more recently, many Sorbus species serve also as relatively fast-growing ornamental trees in the urban centres of the temperate parts of the world.

Sorbus persica has been included in the Red Book of Kyrgyzstan (2006) due to growing pressure on its habitat and indiscriminate cutting.

The map shows the distribution of Sorbus persica in the country. Photos: Isabek Amatov; A. Gaziev

