

TAJIKISTAN

ТАҶИКИСТОН

From raw-material exports to sustainable local ABS value chains: the example of the glucose-impacting ferula species





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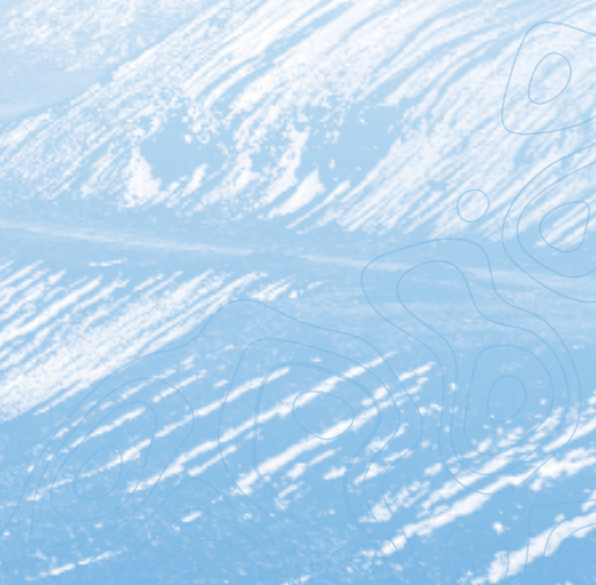
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SETTING THE SCENE

Tajikistan is a country in Central Asia with 93% of its territory composed of mountains. Tajikistan contains a great wealth of biodiversity resources in species, ecosystems and landscapes. Although the nation is small in terms of its overall landmass, Tajikistan displays a wide variation in elevations and geology, leading to a broad range of habitats as reflected in the high diversity of species. The landscapes consist of plains and low mountains (300–1 600 masl) with desert savannoid flora and fauna with gray desert soils; midlands (1 600–2 800 masl) with mountain woodlands and forests and brown mountain soil; highland zones (2 800–4 500 masl) with alpine cold desert flora and fauna, with meadow-steppe, steppe, and desert soils; and nival zones (4 500 masl) with cryophyte flora with skeletal soils. The country's flora and fauna make up 1.9% of the world's species. Floral diversity is relatively rich considering the small size of the country, with wild relatives of cultivated plants totaling 1 000 species, in addition to 1 132 endemic species.



Of particular importance are plants grown for food that comprise about 300 species. The national gene bank for grain, leguminous and oil crops contains about 3 000 specimens. Medicinal plants are the basis of traditional medicine, which is widely used by the population in their daily lives. Additionally, there are 81 species of mammals, 385 species of birds, two species of amphibians, 49 species of fish and 12 000 species of invertebrates. A prominent feature is the large number of animals endemic to Tajikistan.



An increase in economic development and activity in the past years is the main cause of changes in biodiversity and its loss. Owing to soil degradation, arable land has decreased by 3.2% over the last 15 years. In the last 15–20 years, the population has reached a population of about 9 million, and this has had an impact on biodiversity resources, which in turn has led to high deforestation rates, grassland degradation, overfishing and overhunting. Such activities have been observed in the habitats of valuable wild fruit trees. Further, drastic changes to habitats due to the direct removal of plants for wildlife hunting have led to several species being threatened with extinction.





Biodiscovery case

Although the territory of Tajikistan is small, its biological composition is extremely diverse. In Tajikistan, there are 9 000 species of wild plants and 13 000 species of wild animals. There are many valuable species for both science and production among them. Many plants growing in Tajikistan are used for pharmaceutical purposes.

Ferula is a genus of about 170 species of flowering plants in the family Apiaceae, mostly growing in arid climates. Several species of ferula grow in Tajikistan. One species of ferula, which is native to Iran and Central Asia is asafetida (*Ferula asafetida*). It is an herbaceous perennial plant growing up to 2 m tall, with stout, hollow, somewhat succulent stems with a diameter at the base of the plant of 5–8 cm. Asafetida has certain medicinal uses, most commonly as a digestive aid. It is reputed to lessen flatulence and is often added to lentil or eggplant dishes in small quantities. It is also said to be helpful in cases of asthma and bronchitis.

In total, ferula is distributed in about 18 000 ha throughout Tajikistan. Of these, the Forestry Agency maintains 975 ha. It takes a lot of time and hard work to cultivate and harvest ferula. According to scientists, the first-year harvest is limited to a single leaf when ferula is grown from seed. The second-year harvest gives no more than 2 to 3 leaves. Full-size ferula reaches 2.5 m in height. Harvesting is carried out by cutting the stem and collecting the excreted lacteal juice on the scoop. The harvest from one plant lasts 3–4 weeks. When a stem is cut, the plant withers leaving no seeds. Agency staff and collectors are constantly monitoring the process to make sure that there are some plants left for the soil seed bank.

In Tajikistan, traditional medicine is based on plants and use of medicinal plants is an ancient tradition of the indigenous communities that is applied throughout modern Tajikistan. The collection and use of medicinal plants is not limited to Tajikistan, but to neighbouring countries as well. Actually, Tajikistan is primarily a producer of raw materials. For example, ferula and liquorice are regularly exported to Russia to be processed there. Until very recently, due to limited knowledge and demand and a lack of technology, indigenous communities have limited their practices to supporting growth of ferula and liquorice without pursuing any real processing and production.

A recent example of biodiscovery and application of traditional knowledge is the pharmaceutical product “Ferubet” invented and developed by Dr Tojinisso Zubaydova.

The invention relates to a medicine in the field of pharmacology and endocrinology. It can be used for the prevention and treatment of pre-diabetes, type 2 diabetes and diseases involving the gastrointestinal tract and nervous and cardiovascular systems. The product contains an agent with a glucose-lowering effect, made from herbs, and contains ferula gum, resin, root and oil. For the development of the pharmaceutical product, research has been conducted to study the raw material base and all species of ferula from all over Tajikistan. Research showed that the most suitable type of ferula for pharmaceutical use is *Ferula asafetida* which grows in the vicinity of the town of Penjikent.



EYEWITNESS STATEMENT



“Treatments based on the use of medicinal plants is an ancient tradition for Tajikistan that is still in use nowadays. At the same time during the past few decades Tajikistan was treated as a raw material base. For example, ferula or licorice was sent to Russia to be processed there. With information being spread about the Nagoya Protocol, interested government bodies, universities, research institutions are now making efforts to change the situation in this field, including by research on GMP [Good Manufacturing Practices] standards applied in pharmacology.”

DR TOJINISSO ZUBAYDOVA, Head of the Department of Experimental Pharmacology and Biotechnology of the State institution “Pharmaceutical Centre” of the Academy of Medicine Sciences



In June 2017, Dr Zubaydova was awarded a gold medal at the Korea International Women's Invention Exposition for her biodiscovery work that resulted in development of the pharmaceutical product “Ferubet” (a glucose-lowering medicine).



In fine focus: SDGs implemented by the biodiscovery case

Biodiscovery activities contribute to the implementation of the SDGs in Tajikistan. By working with communities on their awareness of ABS principles, the project helps them collaborate and form unions (SDG 16: Peace, Justice and Strong Institutions and SDG 17: Partnerships for the Goals). Given that both UNDP and GEF place a particular emphasis on accelerating gender equality within the project scope, the project team prioritizes work with rural women-headed households (SDG 5: Gender Equality). In the future, the project will strive to

contribute to the implementation of SDG 1: No Poverty and SDG 9: Industry, Innovation and Infrastructure since the government aims at securing a royalty stream for Tajikistani researchers, agencies, companies or resource stakeholders, through the retention of intellectual property in downstream commercial products. Although only a small proportion of bioactive substances reach the stage of commercial production, the creation of a high value, widely sold product, such as a pharmaceutical, may produce significant income streams.





Legal and political enabling environment for ABS and the Nagoya Protocol

The Republic of Tajikistan acceded to the Nagoya Protocol by Decree No. 1312 in 2012. It is expected that the implementation of the Nagoya Protocol in the country will further improve food security, sustainable development, and the conservation of biological diversity and genetic resources. A key place in the hierarchy of legal acts in the sphere of regulation of natural resource management and environmental conservation belongs to the Law of the Republic of Tajikistan “On Environmental Conservation”, which was adopted in 2011. This law is updated annually to strengthen control with regard to the preservation and use of biodiversity. Furthermore, national actions are also guided by the National Strategy and Action Plan on Preservation and Rational Use of Biodiversity of the Republic of Tajikistan and by the implementation of the Law of the Republic of Tajikistan “On Special Protected Natural Areas.”

The institutional base for biodiversity conservation consists of institutions and organizations working on, studying and conserving biodiversity and its components, namely: the Committee on Environment Protection, the National Biodiversity and Biosafety Centre (NBBC), the Forestry Productive Enterprise of the Republic of Tajikistan (FPERT) and the institutes of the Academy of Science specializing in biology, botany and zoology. The Ministry for Nature Protection (MNP) provides coordination and is responsible for implementing the CBD requirements, and develops and implements state policies on nature conservation

and natural resources management. The main units of the MNP are specialized inspection bodies as well as research institutions. The NBBC is in charge of coordinating activities on biodiversity conservation and implementation of the CBD through the NBSAP. The Tajik Academy of Agricultural Sciences and the Ministry of Agriculture work on the conservation and sustainable management of agricultural biodiversity, genetic resource preservation and breeding of new agricultural plants as well as the improvement of existing varieties. Local executive administrations (such as Khukumats) are the executive bodies that implement the CBD in local communities and provide for environmental education.

Tajikistan has yet to develop national legislation that will incorporate fully the ABS principles under the Nagoya Protocol. The absence of legislation at the moment is overcome through the establishment of contracts.

“To help the Government of Tajikistan deal with these issues, the UNDP-GEF project collaborates with the authorities to develop a Law on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits, but also provides advisory support to the development of a national Clearing House Mechanism and National Reporting under the Nagoya Protocol of the UN Convention of Biological Diversity.” – Ms Nargizakhon Usmanova, Team Leader, Environment, Energy and Disaster Risk Management of UNDP, who helps facilitate the project implementation in Tajikistan.



MESSAGE FROM AN SDG ADVOCATE

Generally, community governance structures are strong in Tajikistan, but there is little awareness of the Nagoya Protocol among most of the governmental stakeholders and communities in the country. At the same time, the existing systems, regulations and procedures in place to monitor research on, and access to, genetic resources and traditional knowledge are inadequate and fragmented. Therefore, strong national and local structures are needed to facilitate and improve cooperation and

exchanges in the context of ABS implementation. These structures need to be harmonized with the existing Law on genetic resources and the forthcoming legislation on ABS. The challenge is clear: users and providers of genetic resources need to deal both with communities and various levels of government that are involved in the authorization process concerning PIC and MAT. If ABS procedures are improperly designed and implemented, this can make the process rather long and cumbersome.

“The UNDP/GEF project provides a platform for information exchange and discussion between government, industry, indigenous communities and research stakeholders engaged in the exploration of biodiversity. The stakeholders participating in the project also have a unique opportunity to explore the state of play in biodiscovery research in the Central Asia and CIS region. These discussions, facilitated by the project, help the Government of Tajikistan to be prepared for taking effective decisions regarding the possible commercialization of ABS products within the context of the global framework.”

MS NARGIZAKHON USMANOVA, UNDP

