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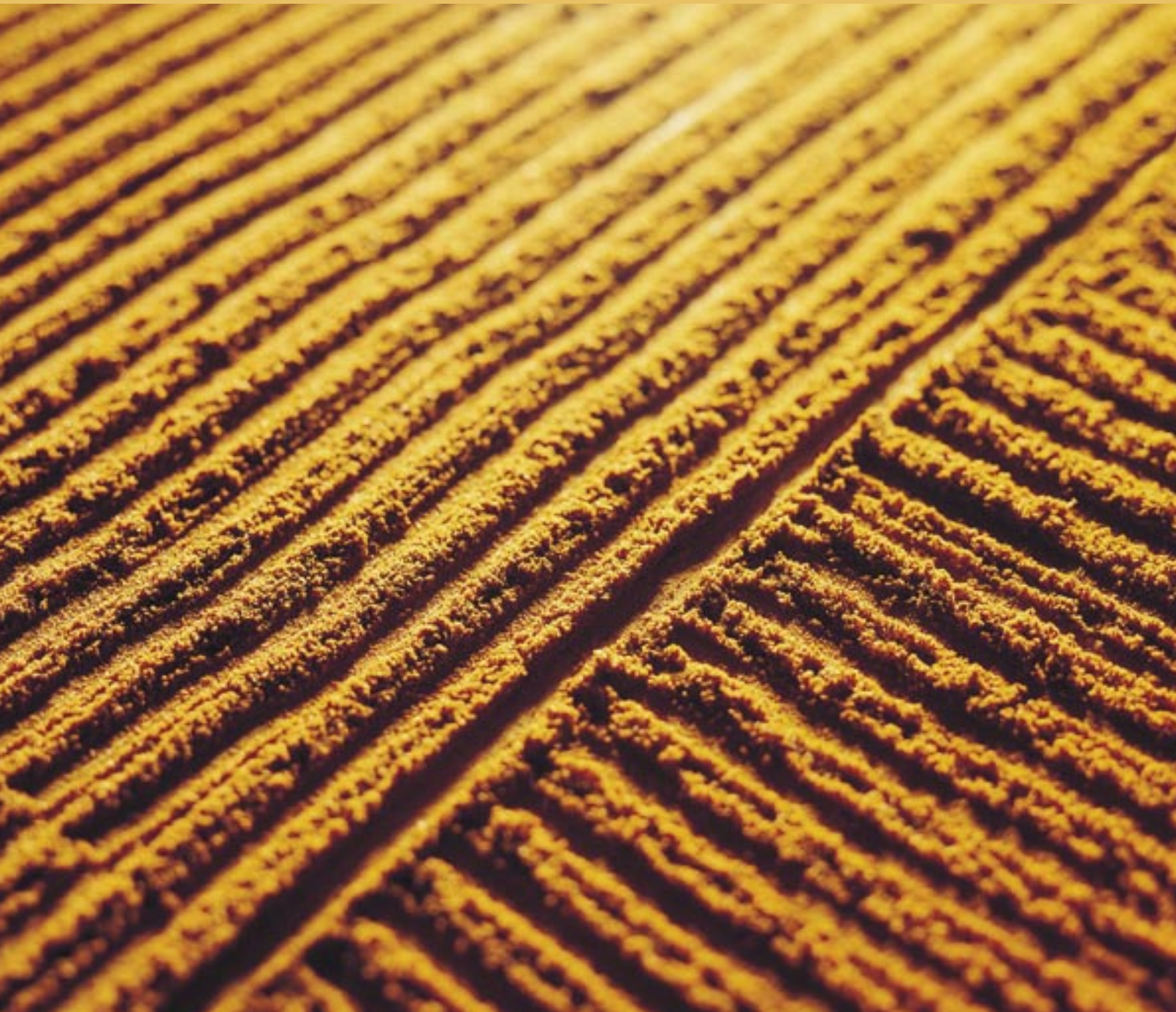
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UNU-IAS Report

The Central Asia and Mongolia Bioresources and Biosecurity Network

**Capacity Development on Access to Genetic Resources,
Benefit-Sharing, and Biosafety in Central Asia and Mongolia**



This report was prepared based on country reports by Central Asian countries and Mongolia as well as the proceedings and outcomes of two workshops: "In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing and Biosafety in Central Asia and Mongolia", held from 30 June – 3 July 2002 in Ulaanbaatar, Mongolia, and "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge, and Biosafety in Central Asia and Mongolia", held from 10–13 August 2003 at Lake Issyk-Kul, Kyrgyz Republic.

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Foreword

The countries of Central Asia and Mongolia are an extremely rich and important repository of biodiversity, including many endemic species adapted to harsh, fragile, and frequently extreme environments. They share a history as centres of origin for many domesticated plant and animal species and are an important source of genetic material, especially for agro-biodiversity. While exhibiting a diversity of national conditions, they share in varying proportions a common geography, which consists largely of mountains, arid and semi-arid regions. Although some countries in the region are now ranked among the poorest in the world in terms of GDP, with large parts of their populations surviving on an average income of less than two US dollars a day, they have a highly educated and extensive base of sound scientific capacity and knowledge of their national environments.

Despite this in-country scientific capacity and the importance of the region as a centre of crop diversity and domestic animals, little international attention has been given to providing support for the conservation and sustainable use of the biological diversity of this region. This is particularly worrisome as these countries are among the most economically, environmentally, and socially challenged in the world at the present time. Extensive cutbacks in spending and stunted development following the collapse of the Soviet Republic coupled with the impacts of globalisation, have worked to exacerbate existing social and environmental pressures, which have led to major impacts upon the natural environment and upon the living standards of the populations of the region.

Concern at this lack of attention and mindful of the provision (Article 20) in the Convention on Biological Diversity (CBD) that consideration should be given to the special situation of developing countries, including those that are most environmentally vulnerable, such as those with arid and semi-arid zones, coastal and mountainous areas, the UNU Institute of Advanced Studies, together with international and regional partners, has established a capacity development programme in the region. The programme focuses primarily on issues of access to genetic resources and benefit-sharing (ABS), protection of traditional knowledge (TK), and biosafety. To date, this has involved the organisation of two workshops, the first in Mongolia in 2002 and the second in the Kyrgyz Republic in 2003, and has resulted in the establishment of a regional Bioresources and Biosecurity Network, to address biodiversity-related issues, the development of a website for the network, and the establishment of a programme of capacity development activities for the coming biennium.

This policy report seeks to give an overview of the current state of biodiversity, relevant law, and policy and capacity development needs in the region. The report draws on the conclusions of both workshops, and on country reports prepared by government representatives nominated by their respective national CBD focal points from the Republic of Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan. A draft report was circulated to the respective country experts and further input was received prior to publication.

It is hoped that publication of this report, consolidation of the network, the launch of its website, and implementation of a regional capacity development programme will help to build awareness of the importance of the region's biodiversity, its needs, and strengthen the voice of the countries of the region in international negotiations.

UNU-IAS places great importance on its engagement in the region. Accordingly, it plans to continue to work in the region and to foster greater awareness of the specific needs of the region internally and externally. To this end, I am pleased that, together with our colleagues in the region, a Central Asia and Mongolia Bioresources and Biosecurity Network is being established and preparations are underway to carry on the capacity development in the region. UNU-IAS will continue to extend technical support to the running and activities of the network.

A H Zakri
Director, UNU-IAS
May 2003/February 2004

Executive Summary

Recent developments in international law and policy have made access to genetic resources, and benefit-sharing (ABS), protection of traditional knowledge, and biosafety the most prominent topics currently under negotiation in the framework of the Convention on Biological Diversity (CBD). The World Summit on Sustainable Development (WSSD) in 2002 called for the negotiation of an international regime on ABS as a step to the sustainable use and conservation of biodiversity, as a step toward achieving the Millennium Development Goals to reduce extreme poverty and hunger.¹ The promotion and protection of traditional knowledge is a topic under discussion in many international fora, including the CBD, the World Intellectual Property Rights Organization (WIPO), and the World Trade Organization. Meanwhile, the entry into force of the Cartagena Protocol and the convening of the first Meeting of the Parties to the Protocol in Kuala Lumpur, Malaysia, in February 2004 has raised the profile of biosafety issues.

Central Asia and Mongolia are rich in both genetic resources and traditional knowledge. The region is the origin of many wild cultivars of domesticated crops of importance to the world, such as apricots and walnuts, as well as of endemic medicinal plants such as liquorice and Trans-Caspian thyme.

The countries of the region exhibit many geographical and climatic similarities, such as arid and semi-arid and mountainous ecosystems and a strong continental climate. However, each contains a certain uniqueness in its ecosystem make-up. Mongolia, for instance, is characterised by permafrost areas and features less than 1 per cent arable land² and therefore a rich nomadic culture based on livestock breeding. Tajikistan features five different climate zones and twenty-five kinds of ecosystems.³ 80 per cent of Uzbekistan and Turkmenistan are covered by deserts. 94 per cent of the Kyrgyz Republic is above an altitude of 1000 meters, characterised by largely un-infringed ecosystems, which are home to large birds of prey and snow leopards.⁴ The Republic of Kazakhstan on the other hand with its vast territory (the ninth largest worldwide) has ecosystems including mountains, steppe, wetlands, and deserts.

These conditions have given rise to unique, but fragile ecosystems and diverse biological resources capable of surviving under extreme conditions, offering interesting potential for bioprospecting activities. However, as countries of the region have a per capita income of less than US\$2 a day for large parts of the population,⁵ the primary concern is poverty alleviation and development. The challenge to maintain their biodiversity is further exacerbated by growing economic pressures, such as mining, hydro-electric power projects, agriculture and the absence of a legal framework to regulate ABS, protect traditional

knowledge and govern the production, transport, use and handling of genetically modified organisms.

Together with the countries of the region, UNU-IAS has embarked upon a capacity development programme. To date, two regional workshops have been held. The first workshop, "In Search of Biosecurity: Capacity-Building on Access to Genetic Resources, Benefit-Sharing and Biosafety in Central Asia and Mongolia", in July 2002 in Mongolia provided an introduction to the relevant multilateral environmental agreements (MEAs) to policy makers and scientific experts from the region and offered a first platform for identification of priority actions. During the second workshop, "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge, and Biosafety in Central Asia and Mongolia", representatives of government, academia and NGOs discussed in detail their capacity-building needs and the resulting answer, the establishment of the network.

As part of this process, experts that have been designated by national governments were invited to prepare country reports on the status of national biodiversity, law and policy, institutional capacity, and capacity development needs.

The most prominent capacity development needs of the region, include the following:

- To build political support and allocation of funding for environmental concerns such as biodiversity conservation;
- Strengthen the weak legislative base;
- Overcome the lack of adequate information and limited access to information;
- Build appropriate scientific and technical expertise with regards to the establishment of ABS and biosafety frameworks;
- Promote institutional coordination within governments and between governments and stakeholders;
- Develop the ability to overcome difficulties in accessing and availability of funding;
- Design mechanisms to reduce direct economic pressure on ecosystems and secure increased recognition of conservation needs in national budget allocations;
- The need for increased public education and awareness;
- The need for support for the promotion and protection of traditional knowledge;
- Build capacity for participation in international negotiations.

The workshops led to the establishment of a Central Asia and Mongolia Bioresources and Biosecurity Network with the principal aim of assisting Central Asian countries and Mongolia to conserve and sustainably use their biological diversity through

the exchange of: scientific, technical, environmental, and legal information, case studies, best practices, and experiences on issues relating to biodiversity, biosafety, biosecurity, and bioresources.

Over the coming two years, the formal establishment and implementation of the network will take place. The priorities of the network for this biennium are to build awareness of the relevant international context, exchange information, educate and raise awareness of the issues, and to strengthen the legislative basis. This work will be promoted by an interim secretariat located in the Kyrgyz Republic, with the support of an international advisory council and UNU-IAS. The work will be supported by an interactive, bilingual, English and Russian multi-authored website, to be maintained by the Mongolian Academy of Sciences. The network will establish working groups of legal experts and professionals to analyse existing legislation on ABS, traditional knowledge, biosafety and intellectual property, to study international experiences, and to make recommendations to strengthen the legislative basis.

UNU-IAS continues to provide technical support to the secretariat and to organise capacity-building activities in the region. It will assist the network to access and link up to international facilities and participate in international negotiations of relevance, and assist the secretariat in developing regional project proposals and prepare reports.

Planned activities include:

- Co-operation at the CBD Conference of the Parties;
- A meeting of legal experts of the region on ABS legislation;
- A meeting to develop a project to create a database of genetic resources;
- A workshop on ABS, information dissemination, and public participation.

1 Introduction

The countries of Central Asia, the Republic of Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan, together with Mongolia are rich in biological resources. The genetic resources of the region have played a major role in the evolution of agriculture through the ages. Many of the wild cultivars of domesticated and economically important flora and fauna, such as the wild cultivar of walnuts and apricots, originated in Central Asia and the region continues to be an important source of genetic resources and information. However, there is concern that wild species and local landraces (i.e. farmers varieties) are being marginalised in the push for increased monoculture/agriculture. This concern has led to recent projects to support *in situ* on farm conservation and use of horticulture.⁶

The countries in the region are also important repositories of traditional knowledge. Many, like Turkmenistan for example, are the holders of traditional knowledge in the field of medicine, while Mongolia is the repository of traditional knowledge on pasture management and dairy products, reflecting its traditional nomadic lifestyle. Traditional knowledge is perceived as a valuable part of cultural heritage and an asset for the sustainable use of biodiversity.

The region is amongst the most environmentally vulnerable in the world with its largely mountainous, arid and semi-arid ecosystems threatened by land degradation, desertification, deforestation, salination and erosion of soil, overuse of biological resources, and soil, water, and air pollution. Climatic and geographical conditions are responsible for droughts, natural drying, and deficits in soil moisture, the thinness of the soil layer, and the prevalence of strong winds and dust storms. In addition to these multiple natural causes, human activities such as clearance and overgrazing, the effects of which are compounded by excessive irrigation, construction of roads and channels, hay production, and damage caused by fires and mining, are major contributors to land degradation. In addition, the countries of the region face diplomatic challenges over the need to co-operate in matters of cross-border management of ecosystems and water resources. The latter is particularly the case for conservation of the Aral Sea, which has shrunk by more than 50 per cent over the past thirty years, resulting in the spread of toxic dust, soil salination, and environmental migration.⁷

The interrelationship between human populations and environmental stability is extremely acute in the region. For example, 70 per cent of the Tajik population lives in desert areas and dry lands,⁸ and the causes of land degradation in Mongolia can be attributed to both natural and anthropogenic causes.

Countries of the region face ever-increasing pressures from economic and social change as they move from planned to market economies. This change, happening at a time of increasing globalisation and the attendant exposure to external influences and pressures, has resulted in poverty and unemployment for some sectors of the population. The result is increasing demand for biological and genetic resources from not only domestic users but also from outside the region. Tajikistan, Mongolia, and the Kyrgyz Republic face demand for mainly medicinal plants, which are used in traditional Chinese medicine and are often sold for a price below their actual market value.⁹

The extreme environment and diverse ecosystems of the region present interesting opportunities for bioprospecting and the discovery of new species and genes with unique properties. For example, Mongolia's deserts, numerous hot springs, a large area of permafrost and many saline lakes, and other extreme environments and high endemism of genetic resources, offers interesting opportunities for those searching for novel compounds for medicinal or other products.¹⁰

The Kyrgyz Republic, the Republic of Kazakhstan and Uzbekistan share the Western Tien Shan Mountains, where more than 3,000 recorded species are located, including many species threatened globally. The Tien Shan region contains many protected areas, which are habitat for a large number of wild species useful to humankind. However, legal measures to protect these areas and environmental monitoring have declined.¹¹

A first step in ensuring that access to genetic resources translates into benefits for the custodians of these resources is to establish mechanisms to regulate access and ensure the fair and equitable sharing of benefits. Thus, there is a clear imperative to develop a strategy that simultaneously addresses both access and benefit-sharing. It is also increasingly urgent to recognise the central importance of conservation to meeting development goals and to putting in place national policies and practices that advance development that is sustainable over the longer term. This was acknowledged most recently at the World Summit on Sustainable Development (WSSD) held in South Africa in 2002 where it was agreed, *inter alia*, that the unprecedented rate at which biological diversity is being lost can be reversed only if local people benefit from the conservation and sustainable use of biological diversity, in particular in countries of origin of genetic resources.

The Johannesburg Declaration, adopted at the WSSD, calls for action to promote the effective participation of indigenous and local communities in decision and policy-making concerning the use of their traditional knowledge. It further encourages the provision of

technical and financial assistance in support of the efforts of developing countries and countries in transition in their efforts to develop and implement national *sui generis* policies and traditional systems with a view to conservation and the sustainable use of biodiversity. In addition to calling for action at all levels to promote practicable measures for access to the results and benefits from biotechnologies based on genetic resources, it was agreed that an international regime should be negotiated within the framework of the CBD to promote and safeguard the fair and equitable sharing of benefits arising from the utilisation of genetic resources.

Equally, there is an imperative to develop biosafety regimes in the region given the environmental vulnerability of the regions ecosystems. The fact that none of the countries has, as yet, any significant biotechnology sector does not lessen the need to address biosafety considerations from an import perspective. There are resource implications associated with the implementation of such policies. Given the scarcity of resources and competing demands for existing resources, it is particularly important to look for synergies and opportunities for cooperative ventures or initiatives that are of broader benefit.

2 Multilateral Instruments

A number of international organisations and multilateral instruments play important roles with respect to access to biological resources and benefit-sharing, intellectual property, and recognition and protection of traditional knowledge as well as the environmental and economic aspects of biosafety and the transboundary movement of genetically modified organisms. Of particular relevance are the Convention on Biological Diversity (CBD), the political declaration and plan of implementation of the World Summit on Sustainable Development (WSSD), the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of the UN Food and Agriculture Organization (FAO), the International Union for the Protection of New Varieties of Plants (UPOV), the World Intellectual Property Organization (WIPO), the Cartagena Protocol to the CBD, and the World Trade Organization (WTO). Despite the absence of universal membership to international agreements and instruments by countries in the region (see Table 1), these bodies and agreements are of much relevance to them as they are the fora where ABS, traditional knowledge and folklore and biosafety considerations are currently being debated and negotiated.

2.1 Access and Benefit-Sharing

2.1.1 Convention on Biological Diversity (CBD)

As Parties to the CBD, the countries of the region are required to take certain measures for the conservation and sustainable use of biological

resources. Articles 6 and 8 of the Convention address general measures for conservation and sustainable use and *in situ* conservation respectively. National Focal Points have been established and all countries have embarked on the development of National Biodiversity Strategy and Action Plans (NBSAPs) for the conservation and sustainable use of biological resources with the involvement of a wide range of governmental and civil society actors. The status of the NBSAPs in terms of approval and implementation, however, varies between countries.

The CBD recognises national sovereignty over genetic resources and requires members to facilitate access to genetic resources subject to mutually agreed terms and prior informed consent (PIC) and promotes fair and equitable sharing of the benefits derived from the utilisation of genetic resources.²¹ It further stipulates measures and obligations for the transfer of technology, and states that intellectual property rights (IPR) should be supportive of the objectives of the CBD.²²

Provisions on ABS have been further elaborated in the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, adopted by Parties to the CBD in April 2002 and which *inter alia* sets out "Draft Elements for an Action Plan for Capacity-Building for Access to Genetic Resources and Benefit-Sharing".²³ The Bonn Guidelines are a voluntary guide for provider and user countries, with the objective to promote conservation and sustainable use of

TABLE 1

Membership of Relevant International Treaties by Central Asian Countries and Mongolia¹²

ACS = Accession
RTF = Ratification
AIP = Accession in Progress

	Republic of Kazakhstan	Kyrgyz Republic	Mongolia	Tajikistan	Turkmenistan	Uzbekistan
UN CBD ¹³	RTF	ACS	RTF	ACS	ACS	ACS
Cartagena Protocol	–	–	RTF	RTF in Progress	–	–
WTO ¹⁴	AIP Started 29 Jan 1996	Member	Member	AIP Started 29 May 2001	–	AIP Started 9 Dec 1994
FAO ITPGRFA ¹⁵	–	–	–	–	–	–
UPOV ¹⁶	–	Member	–	–	–	–
Ramsar Convention ¹⁷	–	RTF	RTF	RTF	–	RTF
UN CCD ¹⁸	RTF	RTF	RTF	RTF	RTF	RTF
WIPO ¹⁹	Member	Member	Member	Member	Member	Member
Aarhus Convention ²⁰	RTF	ACS	–	ACS	ACS	–
UNEP-GEF Project	Member	Member	Member	Member	–	–

genetic resources. It also offers a guide to develop ABS regimes, and promotes technology transfer and the provision of financial resources. Under the Bonn Guidelines, a number of capacity building needs are identified, which are reflected in the region.

ABS is an issue of particular relevance to the domestic or transboundary transfer of genetic resources, the importance of which is recognised by the CBD-approved Global Environmental Fund (GEF) funded capacity development initiative designed to help assess a country's capacity development needs in this area. Recognising that the priorities for capacity development are for the particular country to determine, the Initiative specifically cites ABS as a possible area for needs assessment.

2.1.2 World Summit on Sustainable Development (WSSD)

The Declaration of the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, from 26 August to 4 September 2002, states "... that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development".²⁴

The WSSD Plan of Implementation²⁵ acknowledges that biodiversity plays an integral part in sustainable development and poverty eradication and recognises the CBD as the primary instrument to combat the loss of biodiversity. It emphasises the need to promote international support and partnership; to provide financial and technical support to developing countries and countries with economies in transition on all aspects of biodiversity conservation; to recognise the rights of indigenous communities and other holders of traditional knowledge (TK), to implement benefit-sharing mechanisms for the use of TK and to facilitate the participation of local communities and indigenous peoples in political decision making concerning TK; to promote the implementation of the Bonn Guidelines on ABS; and to "negotiate within the framework of the Convention on Biological Diversity, bearing in mind the Bonn Guidelines, an international regime to promote and safeguard the fair and equitable sharing of benefits arising out of the utilization of genetic resources."²⁶

The Johannesburg Declaration acknowledges that the "ever-increasing gap between the developed and developing worlds poses a threat to global prosperity, security and stability"²⁷ and repeatedly reaffirms the need and commitment to partnerships for development and poverty eradication. Furthermore, the Declaration states that current rapid loss of biodiversity, which is of grave concern, can only be

slowed down if local people, especially in countries rich in genetic resources, are to benefit from the protection of their resources and the resulting gains out of their utilisation. Therefore the Plan of Implementation calls for "practical measures for access to the results and benefits arising from biotechnology based upon genetic resources"²⁸ as an integral part of conserving biodiversity.

2.1.3 International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

Another important legally binding international instrument, with respect to genetic resources and ABS, is the ITPGRFA adopted in November 2001 and administered by the Food and Agriculture Organization (FAO). The Treaty deals with a subset of plant biodiversity, which is important for food and agriculture and has been developed from an earlier and non-legally-binding agreement, the International Undertaking on Plant Genetic Resources.

In line with the CBD, the three objectives of the ITPGRFA are conservation, sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use. The provisions of the Treaty apply only to the genera and species listed in Annex I to the Treaty, but these genera and species, are of importance as they provide more than 90 per cent of the world's caloric intake and thus are key to short term and long-term food security, such as cultivated wheat and rye and many of its related species in Central Asia.

The ITPGRFA establishes a Multilateral System of Access and Benefit-Sharing that provides for facilitated access to the genera and species in Annex I in accordance with a material transfer agreement (MTA), the provisions of which would also apply to subsequent transfers of the genetic resources in question. The treaty encourages the conservation of plant genetic resources through national and international *in situ* and *ex situ* collections of seeds and plants.

The ITPGRFA sets out mechanisms for the fair and equitable sharing of the benefits accruing from facilitated access and seeks to balance the rights of various groups involved, including farmer's rights, and recognises intellectual property right protection. In common with the CBD, the need for financial resources and technical assistance for less developed countries is acknowledged and the Treaty will work alongside the Bonn Guidelines on Access to Genetic Resources.

There are a number of related processes and modalities through which Central Asian countries

may seek to benefit more fully from the provisions of the Treaty. One such modality for technology transfer is the International Centre for Genetic Engineering and Biotechnology (ICGEB).²⁹ The ICGEB is an intergovernmental UN-affiliated organisation dedicated to advancing research and training in molecular biology and biotechnology, with special regard to the needs of the developing world, to promoting the safe use of biotechnology. As yet, no Central Asian country is a member of the ITPGRFA and only the Kyrgyz Republic is a member of ICGEB.³⁰

2.1.4 International Union for the Protection on New Varieties of Plants (UPOV)

Another international agreement related to genetic resources and ABS is the International Convention for the Protection of New Varieties of Plants administered by UPOV. This agreement provides intellectual property protection to improved plant varieties with the stated aim of encouraging breeders to develop new varieties. UPOV has been criticised in some parts for promoting the establishment of patent like protection for plant varieties. The Kyrgyz Republic is the only country of the region that is a member of UPOV.

The UPOV regime defines the basic concepts of plant variety protection to be reflected in domestic laws by its members. UPOV has been criticised in some parts for promoting the establishment of patent like protection for plant varieties. The Kyrgyz Republic is the only country of the region that is a member of UPOV.

2.2 Traditional Knowledge and Intellectual Property Rights

The importance of traditional knowledge for the conservation and sustainable use of biological diversity is widely recognised, and the last decade has seen ever growing efforts to develop mechanisms to respect and protect the rights of indigenous and local communities over such knowledge. Traditional knowledge issues are being dealt with in a number of international fora, including the CBD, World Intellectual Property Organization (WIPO), Convention to Combat Desertification (CCD), United Nations Conference on Trade and Development (UNCTAD), International Labour Organization (ILO), Agenda 21, and the UN Commission on Human Rights (UNCHR).

The principal international legal instrument in this regards is the CBD. Article 8 states that:

Each Contracting Party shall, as far as possible and as appropriate: subject to its national legislation, respect, preserve, and maintain

knowledge, practices and innovations of indigenous and local communities; promote their wider application with the approval and involvement of the holders of such knowledge; and encourage the equitable sharing of the benefits of utilization of such knowledge, innovations and practices.

The Bonn Guidelines, which were adopted at the CBD Conference of the Parties (COP6) in 2002, further detail recommendations to establish a system of Prior Informed Consent (PIC), which is in accordance with CBD Article 15, paragraph 5, as a requirement for access to genetic resources and traditional knowledge.

Existing international intellectual property rights (IPR) systems have to date proved ineffective for securing the protection of traditional knowledge. The concept of individual ownership of the product of intellectual effort as set out in Western IPR regimes is often alien to the cultural practices by which local indigenous communities preserve and pass on their traditional knowledge. Patent law grants individuals exclusive rights of ownership over inventions disclosed in patent applications whilst much indigenous knowledge is collectively developed over long periods of time, shared orally, tends to be undocumented, and is sometimes considered as already being in the public domain.

A Working Group on Article 8 (j) has been established to advise the Conference of the Parties to the CBD on issues relating to the protection of traditional knowledge rights. The WIPO has established an Intergovernmental Committee on Intellectual Property and Traditional Knowledge, Genetic Resources and Folklore and is examining amongst other things measures to strengthen IPR review procedures to protect against the granting of IPR over pre-existing traditional knowledge; pro-active protection of traditional knowledge through the use of existing legal mechanisms (contracts, access restrictions and IPR); and elements for *sui generis* regimes for protection of traditional knowledge. The countries of the region are members of WIPO, although their membership of relevant treaties on IPR protection varies greatly.

The countries of the region all attach importance to the conservation and sustainable use of their biological resources and acknowledge the historic role that the associated traditional knowledge has played as well as its potential contribution to sustainable development in the region. In Mongolia and Tajikistan, traditional knowledge is widely used to determine pasture management and land use, and there is strong traditional medicinal practice based on indigenous plants within medicinal properties in the region. However, policies and practices for regulating access to biological resources in the region or protecting traditional knowledge are largely non-existent. Kazakhstan has expressed interest in genetic

resources and traditional knowledge, but neither Kazakhstan nor the Kyrgyz Republic have in place a legal framework for access.

Mongolia claims to have a considerable body of traditional knowledge, and there is some documentation of such knowledge. In Turkmenistan, the folk healers (tebib) are widely respected and under national patent law have the right to register and receive a protection for medicinal means created by them.

ITPGRFA stipulates that Parties should take measures to promote and protect farmers' rights including with respect to the protection of traditional knowledge relevant to plant genetic resources for food and agriculture; the right to participate equally in the sharing of the benefits arising from the use of genetic resources for food and agriculture; and the right to participate in decision making at the national level on matters relating to the conservation and sustainable use of plant genetic resources for food and agriculture (Article 9 (2)).

2.3 Biosafety and the Cartagena Protocol

The Cartagena Protocol was adopted on 29 January 2000, with the objective of contributing "to ensuring an adequate level of protection in the field of the safe transfer, handling, and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account risks to human health, and specifically focusing on trans-boundary movements".³¹

The countries of the region have shown some interest in investigating the potential of biotechnology to encourage sustainable development by allowing them to 'leapfrog' to advanced technology. All, however, express concern at the lack of adequate scientific and insufficient human resources to enable them to undertake appropriate risk assessment and put in place effective management regimes. None has in place a legal or policy framework addressing issues specific to the international movement of genetically modified organisms (GMOs).

Funding for implementation of the Cartagena Protocol is available under a US\$38.4 million UNEP-GEF Project on the Development of National Biosafety Frameworks (NBF) that aims to assist countries to prepare for entry into force of the Cartagena Protocol through the establishment of NBF. The project is also intended to promote information sharing and collaboration at the regional and sub-regional level among countries that share the same biomes/ ecosystems and the identification, collaboration, and co-ordination among bilateral and multilateral organisations to assist capacity development and optimise partnerships.

The UNEP-GEF project started in June 2001 and will run for three and a half years. It involves more than a hundred countries and is financed by substantial contributions from GEF and UNEP. It provides technical support for the production of National Biosafety Frameworks (NBF) and promotes synergies with other agencies and initiatives. It is organised in three phases: gathering information, consultation and analysis, and drafting of frameworks. Its main activities are the provision of information and support on a global level, promoting understanding of the Cartagena Protocol and exchange of different experiences on NBF development, the training on key elements of NBFs and the identification of the potential for sharing resources and the development of NBFs.

All NBFs have the following key elements in common: regulatory systems, administrative systems, risk assessment and management, public awareness and participation. As of June 2003, 119 countries are participating in the project, and the third series of training workshops takes place from November 2003 to May 2004.

The Republic of Kazakhstan, the Kyrgyz Republic, Mongolia, and Tajikistan are participating in this programme.³² Mongolia and Tajikistan are becoming parties to the Protocol and Turkmenistan has indicated that formal endorsement will be forthcoming shortly. The Republic of Kazakhstan and the Kyrgyz Republic have indicated their intention to become parties to the Protocol once they have completed their National Biosafety Framework development projects and are therefore considered to be participating countries.

2.4 World Trade Organization (WTO)

Amongst the countries of the region only Mongolia and the Kyrgyz Republic are members of the WTO. The Republic of Kazakhstan, Tajikistan, and Uzbekistan have acquired observer status that obliges them to start accession negotiations within five years of becoming observers. These three countries can thus be expected to become members at some point in the future.

The compatibility of the CBD, as well as of provisions of the Cartagena Protocol with those of the WTO Agreements is an issue which is receiving increasing attention. In particular, attention has been drawn to potential conflicts between the Cartagena Protocol and the WTO Agreement on Sanitary and Phytosanitary Standards (SPS) and certain parts of the Agreement on Technical Barriers to Trade (TBT). To a certain extent this debate can be summarised by noting that, in terms of risk assessment relating to transboundary transfer of genetic resources, the Cartagena Protocol allows for socio-economic factors such as the value of biodiversity to indigenous and local communities to be taken into account while

the SPS prioritises economic considerations such as minimising trade effects. Similarly, the threshold for invoking the precautionary principle as a reason for impeding gene flows differs to that in the SPS.

Inconsistencies such as these should not become, however, a reason for non-implementation or non-action. While trade disputes theoretically might arise because of these inconsistencies, the reality is that ratification of the Protocol is slow, reflecting in part issues relating to capacity needs, but also uncertainties regarding the implications for trade of the Biosafety Protocol. There are, however, possible reconciling factors relating to precedent, depending on the reading of treaty law. For the present, the fact remains that WTO is the only body to have an effective dispute settlement mechanism and this may have implications on how a potential dispute would be resolved.

Intellectual property rights regimes have come to play an influential role in international trade of genetic resources and protection of traditional knowledge. The WTO agreement on Trade-Related Aspects of Intellectual Property (TRIPS) (Annex 1C to the Marrakech Agreement establishing the WTO in 1994) established a uniform global system of Intellectual Property Protection. It grants a twenty-year protection for patents but, under the rule of special and differential treatment, gives longer periods for implementation for developing and least developed countries of five and eleven years respectively. Article 27.1 states that patents are available for any invention (product or process) in any field of technology, if they are new, involve an inventive step, and are capable of industrial application. "Members may exclude inventions from patentability...to protect *ordre public* or morality, including to protect human, animal or plant life or to avoid serious prejudice to the environment..."³³

Article 27.3 (b) provides for an exclusion of patentability of plants and animals other than micro-organisms, but members are to provide for the protection of plant varieties either by patent or by an effective *sui generis* system or by any combination thereof. At the 4th Ministerial Meeting in Doha in November 2001, it was agreed to review these articles and, in particular, to examine the relation between the CBD, the protection of traditional knowledge and folklore and the TRIPS agreement (DOHA Ministerial Declaration Article 19).

The TRIPS council was assigned with this task and, accordingly, has been collecting proposals regarding the relation of traditional knowledge and IPR. While a number of developing countries are pushing for the collected proposals to be debated in the WTO, some developed countries oppose this, arguing that the

technical discussions at WIPO should be finished first. Proposals have been made for the establishment of requirements for the disclosure of origin of genetic resources and proof of prior informed consent in any application for a patent on a product developed utilising genetic resources or traditional knowledge. Other proposals focus on the amendment of contracts. The African Group has proposed a draft decision on traditional knowledge to prevent "misappropriation". Under this proposal, patenting of life forms would not be possible and a *sui generis* system for protection of plant varieties would be designed to safeguard farmers' rights.³⁴

3 The Central Asia and Mongolia Capacity Development Programme

In response to a request from countries of the region UNU–IAS, together with various international partners,³⁵ started a capacity development programme to address issues of access to genetic resources and benefit–sharing, biosafety and the conservation and protection of traditional knowledge.

The global debate on these issues is advancing and it is important for Central Asian countries and Mongolia to participate. To do so effectively, however, requires an understanding of these complex issues and of their interrelationships and the opportunity to build national and regional policy and to effectively participate in relevant international negotiation processes.

The UNU–IAS capacity development programme is aimed at providing support to countries of the region in the development of their capacity in these issues. To this end, UNU–IAS is collaborating in the development of a regional strategy to respond to these capacity development needs. This strategy is designed with a view to helping countries of the region to build a network to exchange experiences, strengthen regional co–operation and provide a platform for development of regional policy and negotiation strategies for international fora. The initial steps in this process involved holding a number of regional workshops and the launch of the Central Asia and Mongolia Bioresources and Biosecurity Network and the development of its website.

3.1 Biosecurity I Workshop

In 2002, UNU–IAS, together with UNESCO and the Ministry of Nature and Environment of Mongolia, the Mongolian Academy of Sciences, and the Embassy of Mongolia to Japan, convened a workshop in Ulaanbaatar from 30 June to 3 July. The workshop, “In Search of Biosecurity: Access and Benefit–Sharing and Biosafety in Central Asia and Mongolia” (Biosecurity I), provided an opportunity for experts from the region to consider how best to address the issues of access to biological resources, benefit–sharing, and biosafety as well as the role that traditional knowledge plays in advancing sustainable development.

The workshop sought to identify common regional trends, issues, and concerns, and to catalyze participatory national planning processes and promote ABS by identifying best practices within the region. It aimed at promoting understanding of, and providing knowledge for, policy formation at the national and regional level. It was also intended to increase stakeholders’ awareness of existing international instruments with relevance for such regulatory and policy frameworks and to assess the need for greater institutional capacity.

Biosecurity I was aimed at policy makers, in particular national CBD focal points. The focal points were also asked to provide a country report, which included the state of biodiversity, the experiences gained through implementing the CBD, and the state of legislation on ABS, biosafety and traditional knowledge. These reports contained an analysis of capacity building needs and were presented at the workshop and are summarised in this report.

Participants identified areas needing strengthening including biotechnology capacity; national legislation and regulatory frameworks; legal, technical, and scientific expertise; infrastructure; human resources and training; and communication structures.

The workshop concluded with a panel discussion on next steps, including proposals for the creation of a Central Asia and Mongolia Network addressing bioresources and biosecurity and related development issues; including biosafety capacity development in terms of risk assessment, awareness, and integrated approaches to biosecurity; and steps to increase public awareness and education.

In summary, it was noted that the countries of Central Asia and Mongolia share many commonalities and some differences in their capacity development needs. The region is rich in biological resources and traditional knowledge whose value cannot be fully captured in commercial terms. Shared history and cultural similarities as well as widespread use of Russian as a language common to the region offers opportunities for collaboration in advancing the conservation of biological resources in particular and sustainable development in general.

The workshop highlighted a lack of legal and institutional capacity and the need to establish laws addressing ABS and biosafety. Attention was given to the fact that some of the collections of the regions’ genetic resources are held in institutions of the former Soviet Union with implications for rights over resources and potential curtailment of development opportunities

In addition, the need to increase awareness on the part of scientists and policy makers, as well as amongst the broader public, of the importance of these issues for the sustainable development of the region was identified. The relatively low priority attached to developing ABS frameworks or strategies to develop and promote traditional knowledge was said to reflect a lack of appreciation on the part of policy makers of the contribution that nature management can make to sustainable development and of the potential value of traditional knowledge and genetic resources.

3.1 Biosecurity II Workshop

A second capacity development workshop, “Biosecurity II: A Step Ahead in ABS, traditional knowledge, and Biosafety in Central Asia and Mongolia” (Biosecurity II), took place from 10–13 August 13 at Lake Issyk-Kul in the Kyrgyz Republic. The workshop was organised by UNU-IAS in co-operation with the State Forestry Service, Department of State Control and Protection of Flora and Fauna of the Kyrgyz Republic, and the United Nations Environment Programme Global Environment Facility Division (UNEP-GEF).

The workshop dealt primarily with access to genetic resource and sharing of benefits derived from their use, the protection of traditional knowledge and of the cultures which sustain it, the conservation of biodiversity, in particular crop diversity, the importance of inventories and databases of biological diversity, improving regional collaboration in the scientific community, enhancing capacity to ensure safe handling of biotechnologies, securing wider participation of civil society in decision making processes and strengthening national law and policy in these areas. During the workshop, UNEP presented the issue of biosafety in collaboration with their national partners in the Republic of Kazakhstan, the Kyrgyz Republic, Mongolia and Tajikistan, as part of UNEP’s capacity building programme on the establishment of national biosafety frameworks.

Biosecurity II followed a participatory approach with a large part of the work being undertaken in small working groups. The participants were representatives of governmental agencies, notably the CBD focal points, international organisations, including UNU-IAS, ISTC, UNEP-GEF, scientific institutions and Non Governmental Organizations (NGO).

The participants presented the experiences of their respective countries on implementing their National Biodiversity Strategy and Action Plans (NBSAPs) and on establishing ABS and biosafety frameworks. The respective working groups discussed problems and problem-solving strategies related to ABS, biosafety, and the importance and preservation of traditional knowledge as well as the future action plans for the implementation of the network.

Biosecurity II concluded with the participants’ decision to formally establish a network on bioresources and biosecurity in Central Asia and Mongolia and their identification of a number of key steps for the next two years with the intention of making the network operational, and for capacity development in the region to carry out inventories of genetic resources, regulate access to genetic resources and safeguard rights over traditional knowledge. A declaration setting down the conclusions was prepared by the

participants (see Annex I). These included a number of priority areas for attention and actions to formalise and implement the network, to establish an interim secretariat, and to launch the network website. In order to help realise these objectives, UNU-IAS is actively assisting the Secretariat to seek funding for capacity development activities in the region.

4 Country Reports

The countries of the region exhibit a diverse range of ecosystems and topography from the mostly mountainous Tajikistan and Kyrgyz Republic to the increasingly drought-stricken Uzbekistan, from the diversified terrain and ecosystems of Turkmenistan and the Republic of Kazakhstan to the grasslands of Mongolia. Despite such differences, they share a common need to reinforce or develop their legal and policy frameworks with respect to the conservation and sustainable use of biological diversity, the protection of traditional knowledge, and biosafety, and should be able to find common cause in developing appropriate responses to national, regional, and global environmental pressures and to the changing socio-economic circumstances which the reality of globalisation brings.

Political support is the *sine qua non* for developing and implementing a legal and policy framework for the implementation of the CBD. However, financial resources also play a critical role and all the countries of the region cite limited domestic resources as a constraint to undertaking new initiatives and for implementing and enforcing existing laws relating to biological resources. Some have benefited from bilateral programmes with donor institutions or countries and there has been a limited amount of cooperative initiatives between some of the countries of the region (e.g. Uzbekistan, Kazakhstan, and Kyrgyz Republic, with GEF support, are engaged on the Central Asian Transboundary Project on Conservation of Biodiversity of Western Tian-Shan and all countries in the region are engaged in the GEF-IPGRI project on in situ conservation of agrobiodiversity).

The genetic resources of each country, the extent and state of protected areas, or the status of databases and scientific research are obviously central to the long-term sustainability of a country's ecosystems and the biological resources therein. Detailed discussion of these issues is, however, beyond the scope of the present report. The following summary, based on country reports from the region focuses on issues of particular relevance to ABS and biosafety. It attempts to provide a brief overview of the status of biodiversity conservation, the legal and policy frameworks already in place with respect to ABS and biosafety and to address next steps and the priorities for future action that each country has identified.

4.1. Republic of Kazakhstan³⁶

4.1.1. Biological Resources and Environmental Pressures

The Republic of Kazakhstan's importance to regional and global biodiversity reflects both its territorial size (the ninth largest in the world) and its diversity of landscape and ecosystems, consisting of 7 per

cent mountains, 40 per cent steppes and 40 per cent deserts; the remainder is in large part wetlands. It is home to 835 species of vertebrates, such as saiga antelopes and predatory birds and 96 species of invertebrates and is an important centre for migratory birds and a centre of origin for fruit cultivars. The Republic of Kazakhstan is home to 6,000 species of higher vascular plants and 80 per cent of medicinal plants are located in mountain areas.

Its ability to support and maintain this biological diversity is being challenged by wind and water caused erosion and increased salinisation with the result, for example, that pasture is available for just 51.1 per cent of livestock. The diversity of flora and fauna is decreasing steadily. Thus, 287 of 6,000 of higher plants are listed in the Red Book, as well as 96 of 835 vertebrates. The decline in biodiversity is also attributed to a reduction in recent years in environmental controls and in funding available for research and monitoring. Amongst the main risk factors for biodiversity in the Republic of Kazakhstan are the critical environmental situation in the basins of the Aral and the Caspian Sea, the Semipalatinsk nuclear test area, and the increasing consumption of biological resources. The threat to biological diversity in the Republic of Kazakhstan can be attributed to the destruction of natural ecosystems, the alteration of forests water regimes, the overuse of agricultural resources, water pollution, and the introduction of alien plants and animals into domestic ecosystems. Exhaustion of biodiversity is appearing predominantly in forests, mountains, desert ecosystems, as well as in flood-lands and coastal ecosystems.

Over the last ten years, nearly 385 thousand hectare of forests have been either completely or partly destroyed by fire. Under the pressure of human activities, animal species are being diminished, as is their natural territory. The following animals are under particularly heavy threat: djeiran, cheetah, falcon, balaban, curly and pink pelicans, salmon of the Aral and Caspian Seas and others.

4.1.2 Environmental Policies and Programmes

The Ministry of Environmental Protection (MEP) is responsible for the conservation of biodiversity and for implementation of the CBD. In 1997, MEP established a working group comprising specialists from many sectors and institutions to develop the National Biodiversity Strategy and Action Plan (NBSAP) for the conservation and sustainable use of biological diversity. This work resulted in the "Country Report on Conservation and Sustainable Use of Biological Diversity" and the National Biodiversity Strategy and Action Plan (NBSAP) which has been approved by the Ministry of Natural Resources and

Environmental Protection in 1999. At the date of publication, the NBSAP has yet to be adopted by the Government. The protection, reproduction, and use of biological resources are regulated by MEP, with the Forestry and Hunting Committee of the Ministry of Agriculture having direct responsibility for the implementation of regulations. The Ministry of Science and Education is also involved in this area and research is being conducted by several other agencies and educational institutions.

The analysis on which the NBSAP is based also flags the incomplete state of inventories, mapping, and accounting of biological resources and ecosystems, and asserts that bioresources management systems are non-operational, highlighting the need to improve the state management structure, to develop a legal framework with respect to biodiversity, and to establish a biological monitoring system. The importance of improving economic incentives for conservation and sustainable use and increasing public awareness, and the role of local communities in preserving traditional ways are also acknowledged in the NBSAP. The Strategy also notes the importance of developing additional protected areas, currently accounting for 0.5 per cent of the national territory; and of both *in situ* and *ex situ* conservation, including the establishment of germplasm banks.

In order to complete the inventory of biodiversity and to advance biodiversity conservation and its sustainable use, the NBSAP proposes the development of a network of scientifically based protected areas, including wetlands and the conservation and balanced use of forest areas as well as the publication of the remaining volumes of the Republic of Kazakhstan's Red Book, and compilation of the book of the genetic foundation of the Republic of Kazakhstan's flora and fauna. The formation of an *ex situ* germ bank of endemic and disappearing plant species and a bank of agricultural crop germplasm are identified as areas requiring priority attention.

The NBSAP refers to a number of ongoing projects that are receiving bilateral and multilateral international financial support, and to some fifty projects involving NGOs and Kazakhstan's legislative and executive authorities. The Republic of Kazakhstan has developed a capacity development proposal relating to biodiversity information management that has been accepted by GEF for implementation and will be a major contribution towards the establishment of a national clearing house mechanism.

The NBSAP addresses genetic resources and biosafety as issues for long-term action and there are a couple of state programmes in the field of biotechnology and the conservation and expansion of genofunds. In general, genetic resources have not, however, been treated as a priority issue in the Republic of Kazakhstan's National Plan. The Republic of Kazakhstan has, as yet, no specific law on access

to genetic resources. Work on *ex situ* conservation of genetic resources has included the creation and development of germ culture collections and the creation of genetic banks.

The Institute of Microbiology and Virology of the Ministry of Education and Science and the Institutes of National Academic Centre of Agrarian Researches (NACAR) have developed and prepared for publication a "Catalogue of Germs". NACAR also conducts research on the conservation and effective use of the germ cultures genetic fund, in particular in areas relating to lactic acid germs, yeast and wine cultures. However the absence of centralised collection of germ cultures; differences in storage conditions; and inadequate funding and technical expertise inhibit the effective use of germ resources in the various agricultural and industrial sectors. Similarly, the effectiveness of the work of various institutes, botanical gardens, and zoological parks engaged on *ex situ* conservation of flora and fauna genetic resources is limited by the fact that not all main climatic zones are represented in botanical gardens. This limits possibilities to cultivate and re-introduce rare and threatened plant species from unrepresented zones.

Realisation of the NBSAP will require a multisectoral approach, as many proposed actions and measures are beyond the mandate of MEP and will require integration with other national programmes and funding from the central government budget.

4.1.3 Biosafety

Kazakhstan is home to more than 200 native types of agricultural plants, 90 per cent of which are relatives to domestic food cultures—including several traditional derivatives of apples, apricots, pears, vine trees, and other plants. The large amount of unresearched biological resources coupled with the potential risks of GMO's influence raises the necessity for biosafety regulations in the country. The Government of the Republic of Kazakhstan considered the issue of GMOs in 1997, when an attempt was made to import transgenetic agricultural food materials.³⁷

The current policy and legal instruments on biosafety include the "Concept of Healthy Lifestyle and Nutrition"³⁸ of 1999 and several subordinate regulatory and prohibitory injunctions adopted by various ministries and other central implementation departments.

The Republic of Kazakhstan has the scientific and technical capacity and a resource base to address the possibilities and concerns related to biotechnology and biosafety. Applied research in biotechnology is being carried out by the Kazakh Academy of Food. From unpublished data, it appears that GM food products may be entering the country from China, USA and Canada.

In 1993, the National Centre on Biotechnology was established and the Republic of Kazakhstan is now pursuing several research programmes to enhance its biotechnology capacity, including the formation of a “Technopark of Research and Production Association ‘Progress’” in Stepnogorsk.³⁹ A law on the labelling of GM products is under consideration in the Parliament. However, national priorities are not yet determined. Existing programmes are science-based rather than policy-based. Although many existing laws under different departments impact on biosafety, there is no separate law dealing exclusively with biosafety.⁴⁰ The major issues to be addressed to ensure biosafety implementation in the country include: legal instruments, administrative structure, decision-making system/regulations on GMOs, and mechanisms for public participation.

The Committee of Forestry and Hunting of the Ministry of Agriculture and UNEP-GEF is implementing a project called “Development of National Biosafety Frameworks for the Republic of Kazakhstan”. In the framework of this project, a national database of experts and their work is being developed. The project is expected to assist the Government in joining the Cartagena Protocol on Biosafety.

4.1.4 The Challenges of Implementation

The Republic of Kazakhstan faces a number of challenges in its efforts to implement its CBD commitments including the need to enhance national coordination and intersectoral co-operation, a lack of funds and of financing mechanisms, and the need to improve economic incentives and the legal framework.

A number of steps have been identified in order to further compliance with the CBD. These include the development and adoption of a law on the protection, conservation, and sustainable use of flora; the development of a legal framework for the regulation of and access to genetic resources; the establishment of a National Coordination Centre on issues of access to genetic resources; and the development of a framework to control and monitor the Republic of Kazakhstan’s international transactions in this area.

Further steps include the development of a legal framework for the conservation and balanced use of biological resources, improved economic incentives to advance these goals, increasing public awareness, and recognition of the special role of local communities who have preserved traditional ways for the sustainable use of nature. A start has been made in this area, with several GEF supported initiatives being implemented by local communities.

The Republic of Kazakhstan also acknowledges the importance of enhanced regional interaction and international co-operation in meeting biodiversity

goals and is already engaged in a number of conservation projects with the support of GEF, World Bank, United Nations Development Programme (UNDP) and Tacis.

In relation to ABS, there has been recent private sector interest in purchasing genetic resources. MNREP’s Forestry, Fishing and Hunting Committee, however, is inadequately staffed to be able to manage biological resources in accordance with its mandate to represent the national interest in the context of access and benefit-sharing and there is no normative and legal framework on access to genetic resources.

4.2 Kyrgyz Republic

4.2.1 Biological Resources and Environmental Pressures

The Kyrgyz Republic supports a high density of species and ecosystems and the unique and varied biological resources of the Kyrgyz Republic continue to play an important role in the economy and traditions of the country. Many species are used directly for both subsistence and commercial extraction with 600 plants, including 200 species of medicinal plants, being used by local people. The country is also a centre of origin for domesticated fruit crops such as walnuts, apples, apricots, and pistachios.

The Kyrgyz Republic is home to over 20,000 species or 0.8 per cent of known species, a remarkable biodiversity richness, considering the Kyrgyz Republic’s extreme climatic and environmental conditions, with over 94 per cent of the country being more than 1,000 metres above sea level and 40 per cent above 3,000 metres. Many ecosystems are concentrated within a relatively small area and fourteen of the twenty-two ecosystems found in Kyrgyz Republic are found between altitudes of 2,000 and 3,000 metres. The mountains not only support fragile ecosystems but also fulfil an important role by providing water to the plains of Central Asia.

The lives of rural populations and biodiversity are intimately linked. Pastures where the original communities of species exist are often those of greatest forage value. The traditional biological methods of natural pest control have been important in maintaining the health of these resources for those such as fishers, hunters, and collectors of medicinal plants who depend on them for their livelihood. Also of importance is the diversity of wild ancestors of cultivated plants and species that comprise an invaluable genetic source for selective breeding. The scale of collection and commercialisation of wild flowers is increasing and there is a growing commercial collection of snakes, predatory birds and other animals.

Approximately 1 per cent of all species in the Kyrgyz Republic are considered threatened. Many of the species and habitats of the Kyrgyz Republic, including many of economic and functional importance, have shown dramatic declines over recent years. Forest cover has been reduced by more than 50 per cent over the last fifty years and areas of pasture have been severely degraded. Species of economic importance are disappearing from accessible areas. Moreover, habitats have been affected by over-use, the extraction of minerals, and pollution and at present 193 species of animals, such as the snow leopard, the marbled polecat and the Tien Shan brown bear, and plants are threatened with extinction in the Kyrgyz Republic.

The decline in many species is, to some extent, the result of over-collection but, to a greater extent, reflects habitat degradation and loss. Although some ecosystems are protected by virtue of their inaccessibility and a relatively high proportion of natural ecosystems reportedly remain intact, around 10 per cent of land has completely changed its habitat type. This change began with the mass settlement of the traditionally nomadic people in 1921, on top of the then Soviet Union land reform and the loss of private property rights. The environment has also been subjected to the effects of industrial production, mining, and other extractive industries.

Pressure on ecosystems is increasing due to a greater amount of mining construction, road construction, and hydro-electric power facilities, which has in turn led to massive habitat degradation, the overuse of biological resources, and pollution of the environment.

There have also been widespread social difficulties associated with the transition process which have led to an increased reliance upon natural resources, especially by the rural poor, where biodiversity provides important subsistence and income opportunities. This in turn has resulted in pollution, massive habitat degradation and the overuse of biological resources at the same time that institutional capacity to respond to these impacts has been reduced, further intensifying the reliance of the rural poor on natural resources.

4.2.2 Environmental Policies and Programmes and the Challenges of Implementation

Government programmes that focus specifically on biodiversity conservation are limited in scope but include an existing network of eighty-six protected areas, as well as the creation of the State Forestry Service and extensive legislation designed to protect biodiversity and regulate its consumption and use. Financial pressures have impacted protected areas in terms of staffing, the efficiency and effectiveness of protected areas management, and the enforcement

of ecological protection. It has also affected the ability to expand areas under protection. Existing *ex situ* centres provide an important resource for conservation and a number of independently funded *ex situ* conservation projects are currently active within the Kyrgyz Republic.

The Kyrgyz Republic has a strong research and education base that has the potential to support conservation activities and there is an extensive repository of knowledge of national plants and animals. Although information is lacking for some lesser known taxa or species associated with little known ecosystems and habitats, substantial data collections and species inventories exist. However, there is a lack of research on mitigation of species loss, relationships between organisms, and the cultural and aesthetic values of biodiversity. Recent financial constraints have crippled scientific institutions and led to the abandonment of long-term research and monitoring programmes.

Low public awareness of biodiversity issues has meant that ecological impacts are not considered at the community level and there is limited involvement of local communities in conservation activities, and onsequently, in decision making on ecological protection. It will be important for the development and implementation of future independent projects that public awareness and public involvement in biodiversity conservation and an increasing role of NGOs in this area is already noted.⁴²

In recognition of the important role that environmental education can play, eco-education programmes have been introduced in schools and universities. However many of these programmes tend to be rather disparate and fail to take a holistic approach or tackle the complexity of the problems.

There is an increasing need to develop financing mechanisms to address the sizable reduction in state support and to respond to the environmental impact of increasing economic activities and improve biodiversity conservation outside protected areas. International financing is helping to provide short-term assistance. However, it is vital that more sustainable mid- and long-term financial mechanisms are sought for continuing biodiversity conservation.

4.2.3 The Legal Framework

The Kyrgyz Republic has assumed international obligations under a number of multilateral environmental conventions and is beginning to develop a network of regional and interstate co-operative agreements. Ecological legislation addresses, *inter alia*, provisions for the use of natural resources; prohibition on the collection or rare and endangered species; quotas for amateur commercial fishing and hunting; identification of licensed

activities (hunting, fishing, medicinal collection of plants, etc.); the creation of protected areas; requirements for mitigation actions in association with economic activity; the identification of ecological violations, responsibilities and enforcement; and compensation to be paid for damage resulting from illegal use of natural resources.⁴³

The Kyrgyz Republic also regulates commercial activities that impact or use agricultural, forest, fish, land, or water resources. Despite a sound legislative base, existing laws are said to be neither adequate nor extensive enough for the protection of natural ecosystems and biological diversity. Even those that exist are often not applied as the mechanisms for enforcement are unclear and under-funding of existing structures has reduced their effectiveness and restricted the enforcement activities, with the result that many legal provisions are not being applied. Currently, laws provide for the regulation of environmental protection and pollution but there are no legal restrictions on the further development of natural ecosystems. The report has identified the need for laws, based on sound science, that address nature protection, the consequences of ecosystem destruction, and the extinction of species.

4.2.4 Biosafety

The Kyrgyz Republic has established a National Coordination Committee on biotechnology, which is to define policy priorities. At present there are no definite policies in place to govern genetic engineering. However, there are several laws with relevance to biosafety, including the following: Law on "Environment Protection"; Law on "Ecological Expertise", Law on the "Animal World"; Law on "Biosphere Territories in the Kyrgyz Republic"; Law on "Licensing"; Law on "Standardization"; Law on "Protection of Consumers Rights"; Decree #63 of the Government of the Kyrgyz Republic of 14 February 1994 on the "Adoption by the Kyrgyz Republic of the Charter of the International Center of Genetic Engineering and Biotechnology"; Law on the "Introduction of Amendments and Additions to the Law of the Kyrgyz Republic on 'Environment protection' adopted by the Legislative Assembly of the Parliament of the Kyrgyz Republic on 28 December 2001.

Presently the Kyrgyz Republic is part of the UNEP-GEF project on the Development of National Biosafety Frameworks. It has conducted several seminars on biosafety, targeting representatives of the food industry, government and ministries and NGOs separately.

The Kyrgyz Republic is developing a Comprehensive Development Framework towards 2010. The Soros Foundation "supports a project on the 'Creation of Realization of Human Rights to Choose Among GMO and Other Types of Products.'"⁴⁴ This project is based upon Article 35 of the Kyrgyz Constitution,

which states that each individual has the right to a favourable environment.⁴⁵

4.2.5 Traditional Knowledge and IPR

The Kyrgyz National Patent Authority is exploring possibilities for the development of a national project to examine protection of traditional knowledge.

4.3 Mongolia⁴⁶

4.3.1 Biological Resources and Environmental Pressures

Mongolia is a country with exceedingly variable climatic conditions, which give rise to many unique ecosystems and biota, extreme environments and a high endemism of genetic resources. For example, one quarter of Mongolia's ecosystems consists of deserts and the country has numerous hot springs, a large area of permafrost, and many saline lakes. There is a strong probability that new species and genes, having unique properties or producing diverse compounds, which have adapted to these extreme conditions, may be discovered.

The 457 species of birds found in Mongolia account for 5.1 per cent of birds registered worldwide. Mongolia is home to 138 species of mammals and 75 species of fish. Insects are the most numerous fauna group (12,500) of which 2,000 species are described as new species for the world.

This biodiversity has traditionally played a significant role in Mongolian life. For example, Mongolia has around 845 species of medicinal plants, over three hundred of which are currently in use for diverse medicinal purposes and pharmaceutical purposes; and twenty species for herbal tea making.

There are 120 species of food plants, including trees, berries, grasses, and wild onions, etc, being used as food sources depending on local customs. In terms of pasture maintenance, more than 1,000 species are used for livestock grazing purposes, many of which are soil-binding plants. Mongolia's Redbook lists 100 species of vascular plants, 103 animal species, including the Bactrian Camel, the Gobi Bear, Przewalski's Horse as well as certain breeds of antelope, elk, boar and beaver, and 30 species of birds as rare or endangered as well as a number of fish, amphibians, reptiles, insects and mosses, algae, lichens, and fungi.

Mongolian flora is considered to be relatively well studied and in the past taxonomic studies have been carried out at the Institutes of Biology and Botany at the Mongolian Academy of Sciences. However, most biological collections are in a poor state as economic difficulties associated with the transition to a market economy have negatively impacted the government's ability to provide adequate funding for preservation

activities and *ex situ* conservation facilities. Although inadequacy of funding limits the ability to carry out taxonomic studies up to present-day standards and there is a stated need to upgrade facilities and levels of knowledge. Government research institutes, however, have the potential to serve as national taxonomy focal points.

The botanical gardens in Ulaanbaator carry on *ex situ* conservation but face reduced operational capacity as a result of financial problems and shortage of qualified staff. In general, insufficient technical and scientific knowledge prevents Mongolia from significantly meeting its obligations under various Multilateral Environmental Agreements.

4.3.2 Environmental Policies and Programmes

Mongolia's Constitution states, that "every citizen has the right to live in a healthy, secure environment and has [the] right to be protected from environmental pollution and natural destructions". However, as with other countries in the region, Mongolia faces deterioration of ecosystems and habitat degradation. This in part is the result of anthropogenic activities such as overgrazing and mining. It also reflects the harsh Mongolian environment where the impact of naturally occurring droughts and windstorms intensifies the effects of economic activity on the thin soil layer and its moisture deficiencies and composition.

Mongolia's National Action Plan on Biological Diversity Conservation Activities, adopted in 1996, includes an analysis of the state of biodiversity and the threats thereto and establishes long-term conservation, restoration and proper use objectives and actions. Preparation of the plan which included multi-stakeholder participation from both the public and private sector, was led by the Ministry for Nature and Environment and supported by the GEF. Conservation strategies are included in the State Policy on Environment (1997), the National Program on Special Protected Areas (1998), and the Action Plan of the Government for 2001–2004. However, there are problems in ensuring that these strategies are incorporated and acted upon in the programs and plans of other natural resource sectors. Other relevant policy documents include a National Environmental Action Plan and a National Master Plan for Protected Areas.

Legislation has been passed during the last five years covering environmental protection, natural plants, natural plants use fees, and hunting permission and payment. Laws have also been adopted on the Protection of Nature; Special Protected areas; Areas Adjacent to/Buffer zones of Areas of Special Protection; Natural Plants; Fauna; Protection of Plants and the Plan of Action on Conservation of Biological Diversity, and National Plan/Programme on Areas of Special Protection.

The Protected Area System in Mongolia covers 40 per cent of the area where threatened or endangered species of wild life and plants occur and the long-term goal is to expand this to 30 per cent of the country's territory. Mongolia has also engaged in international initiatives in this area such as the 1994 trilateral agreement establishing a joint protected area between China, Russia, and Mongolia and participates in the Altai Sayan region project with Russia, China, and the Republic of Kazakhstan.

Although Mongolia has entered into a number of joint ventures with respect to the conservation and utilisation of genetic resources, there are no laws addressing access to genetic resources. There is a considerable body of both general and specialised information available on biological resources in Mongolia. Access to and use of this information is, however, limited by the lack of finances and the modern equipment and technology that would allow for the development of a more integrated and regularly accessible information base.

4.3.3 Traditional Knowledge

Mongolia has a considerable body of traditional knowledge mainly with respect to livestock breeding, human and animal health and pasture management. However, there has been no attempt to incorporate traditional knowledge or practices into the National Action Plan.

Among different traditional knowledge and practices of the nomadic people of Central Asia, the following four areas are most prominent. These are:

- system of pasture rotation that does not cause the degradation of the pastures;
- veneration of nature that helps to preserve biodiversity and the environment;
- traditional medicine;
- traditional methods of preparation and storage of food products that utilise the available natural resources and biodiversity and supply indigenous people with wholesome foods containing micro- and macro-nutrients, vitamins, amino acids, antibiotics and enzymes.

Mongolian traditional milk products are a good example for the use of available biological products such as milk of various domesticated animals and microbial diversity. Mongolian Patent Law stipulates that although medicinal products including those derived from microbiological methods can be patented, methods of treatment may not.

4.3.4 Biosafety

Since 1986, Mongolia has stated that biotechnology is one of its priorities and has set up a National Biotechnology Board.⁴⁸ Between 1991 and 1995 Mongolia implemented the following goals under

BOX 1**Mongolian Traditional Milk Products and their Microorganisms⁴⁷**

B Tsetseg

Due to their traditional nomadic lifestyle based on livestock farming, Mongolians have acquired experience in the skillful use of milk of domestic animals for food and beverage production. Mongolian milk products and the technologies for their production are very well adapted to the living conditions and climate of Mongolia. Most of these products and technologies are exclusively endemic to Mongolia. Milk products have historically made up the main part of the Mongolian diet throughout the year. On the basis of practice and experience Mongolians have learned in detail the curative and nourishing values of milk products and have consumed them not just as a food, but also as a complete nutriment and a medicinal remedy.

The distinctiveness of traditional Mongolian technologies for the production of milk products lies in the successive treatment of all components of milk such as fat, protein and sugar to produce not just one, but also a number of different products, leaving no waste product. For their preparation, Mongolians use milk from five traditionally farmed animals; that is, horses, cows, sheep, goats, and camels and also the milk of yaks and deer.

Despite the fact that milk of any animal contains the same compounds, its relative composition varies due to the species of animal, the season, the lactation period of the animal, and how it is being reared. Therefore, the varieties and kinds of milk products to be prepared are chosen in accordance with the quality and composition of the milk. For example, sheep milk that is thick and rich in fat and protein is generally used for the production of *byaslag* (cheese), *urum* (dried cream skim), *arauul* (dried cheese-like product) and *tarag* (yogurt). The mare's milk containing more lactose and less protein and fat is used just for the production of *airag* (koumiss).

There are four main milk processing methods with different modifications, namely: *khooruulekh* (boiling), *burekh* (lactic acid fermentation), *esgekh* (combined lactic acid and alcoholic fermentation) and *eeduulekh* (acid coagulation).

The fermentation of milk is a very old technology. There are many historical descriptions of scholars and travellers about the fermented milk products of Mongolia. In the fifth Century BC, Herodotus from Greece wrote that nomads could store mare's milk by fermenting it into *airag*, but the technology was kept a secret. The French traveller V Rubrik and the Italian traveller Marco Polo, who both visited Mongolia in the 13th Century, left very interesting descriptions of the fermentation technology of *airag* and its intoxicating effects.

Mongolian milk products can be classified as non-fermented and fermented milk products. Fermented milk products can be further sub-divided into products of lactic acid fermentation (*tarag*, *khoormog*, *byaslag*, and *eezgii*) and products of lactic acid fermentation combined with alcoholic fermentation (*airag*, *undaa*, *arkhi*, *aarts* and *arauul*).

The composition of the bacterial cultures used for the preparation of traditional fermented milk products is composition variable and not well-known. Usually, a part of good quality *airag* is dried for long-term storage and then used as a starting culture when needed. *Tarag* or *undaa* (*airag* from milk of any domestic animal) can be used as a starting bacterial culture. Each family preserves its own bacterial cultures. Sometimes these cultures are passed down through generations.

the "Biotechnology" programme decided in 1990: build capacity to advance biotechnology research, set up small- and middle-scale enterprises to develop markets for biotechnology products, and to research traditional biotechnology related technologies. Since 1998, over thirty basic and applied scientific projects have been implemented in veterinary, medicine, agriculture, animal husbandry, plant protection, and industry.⁴⁹ As a result of study of fifty different species of plants carried out at the Institute of Chemistry and Chemical Technology, MAS, about 500 individual compounds have been isolated of which 119 were novel compounds.⁵⁰ However, Mongolia has still only a very limited capacity in biotechnology, with low production capacity and no institutional capacity for risk assessment and management. There are currently no regulations in place and no registration process for the use or importation of GMOs. As in other areas relating to biodiversity, financial resources are a decisive and limiting factor.

In November 2002, the Mongolian Parliament ratified the Cartagena Protocol and at present efforts are being made to identify capacity development and

risk assessment needs and activities and to build on existing initiatives with international partners. Importance is attached to preventing introduction, controlling and eradicating alien species that threaten ecosystems, habitats, and species and some fundamental laws and regulations have already been adopted, particularly with respect to imports and exports of alien species.

4.3.5 Priorities for Implementation

The country report has identified a number of priority areas for possible international co-operation and assistance. These include the establishment of initial regulations and procedures; testing and evaluating safety at laboratories and research institutions; training and technical education; public education and awareness-raising; and scientific assessment of the impacts on environment and biodiversity.

The report has also identified a number of actions that need to be taken. These include the appointment of national focal points; the strengthening of

the Clearing House Mechanism (CHM) and appropriate database; human and institutional capacity development, assessment and inventory and information management systems; and the development of legislation and the formulation of national policy and administrative measures and guidelines for ABS, taking into account the development of a multilateral process in the context of the ITPGRFA and the preparation of case studies on issues of national intellectual property rights in relation to the CBD and ABS as a precursor to reviewing national laws on property rights. There is also a need to develop risk assessment capacity for biosafety issues.

Recent years have seen increased allocations to biodiversity conservation in the national budget but ultimately, the future of biodiversity conservation in Mongolia will depend largely on international financial and technological assistance.

4.4 Tajikistan⁵¹

4.4.1 Biological Resources and Environmental Pressures

The mountain ecosystems of Tajikistan and their unique biodiversity are of great regional importance. Tajikistan features five climate zones and twenty-five different kinds of ecosystems. The richness of

Tajikistan's biodiversity can be illustrated by the fact that it is home to the same number of species as the Republic of Kazakhstan, a country almost twenty times its size. Tajikistan is a centre of origin for the genesis of many species of plants now used in agriculture. These wild relatives of cultivated plants and animals are a valuable, rich, and unique genetic fund. The ecosystems of Tajikistan and its biodiversity are in delicate equilibrium and are vulnerable to the impact of anthropogenic activities.

Mountains comprise 93 per cent of the terrain of Tajikistan that represents a huge pyramid rising from the desert, with about 50 per cent of the country being at altitudes of 3,000 metres or more. The combination of latitude, longitude, and altitude create a great variety of "ecological niches" which have been significant factors in the evolution of Tajikistan's flora and fauna. Examples of the rich biodiversity can be found amongst approximately 800 endemic and species of plants and 162 animals and a genetic fund of 1,457 varieties of wild-growing fruit plants. The fauna of Tajikistan includes 84 species and sub-species of mammals, 346 species of birds, 47 species of reptiles, 52 species of fish, 2 species of amphibians and more than 12,000 species of invertebrates, reflecting the fact that habitat ranges from hot dry deserts in the south to the cold high mountains of Western and Eastern Pamir.

It is estimated that 1,500 kinds of herbs are used in traditional medicine, and that 70 species of herbs

BOX 2

Traditional Methods of Protection and Use of Flora and Pastures by the Nomadic Population of Central Asia⁵²

G Erdenejav

The assimilation of local plant resources by nomadic peoples has not been well studied in the past. Since 1921, an effort has been made to study the local plants resources in Mongolia and to document the knowledge passed down by herders from generation to generation. Although both botanists and ethnographers often come across instances of local plants used in every day life of the population, much of the local knowledge and practices tend to be overlooked especially if a survey is too broad or if there is little or no coordination between the fields of study.

Reflecting its lifestyle, Mongolia has a rich body of traditional knowledge with respect to pasture management and forage crops. From time immemorial, the strength and well-being of livestock have depended on the herder's knowledge of pasture use and maintenance. This knowledge has been documented as early as the 18th Century when a "Manual on Horse Management" was written. It is of particular interest to note the extent and depth of knowledge that allows for fodder evaluation of the main varieties of pasture plants. Knowing where to graze herds depends on an understanding of varieties of grasses, of their nutritional properties and seasonal variations as well as their poisonous or negative qualities, in terms of the effect on animal skins for example.

Over the centuries, Mongolian herders have accumulated a detailed knowledge of pasture usage and the respective importance of climate, vegetation, and soil conditions. This reflects the close relationship that the herders have with their environment and allows them to select appropriate pastures, depending on the time of year and the season.

When selecting pastures and nomadic camps herders would take into account shelter from wind and weather, the adaptability of pastures for different animals at different time of the year, the availability of "huzhir" and "shuu" as mineral supplements for animals, the availability and abundance of water, and the lack of diseases, epizootic or pathogenic sources.

Based on geographical and other properties of the fodder crops growing in a certain location, pastures are divided according to seasonal suitability, whether they are near or far from a nomadic camp, whether favourable for good weather or bad weather grazing or for every day use. This traditional knowledge of both pasture and terrain form the basis of modern animal husbandry.

have entered into official medical practice though in many cases the natural stock is not sufficient to allow for wide spread use.

Tajikistan faces increasing pressures on its biological resources with emphasis shifting from their value as elements of genetic, cultural, and aesthetic heritage to a focus on their commercial value as objects of consumption, with attendant effects on habitat. This is reflected in the fact that approximately 50 per cent of the Tajikistan's mammals are endangered.⁵³

4.4.2 Environmental Policies and Programmes

Tajikistan has taken a number of actions to conserve biodiversity, including *in situ* conservation of genetic resources in thirteen nature reserves and one micro reserve. As of 1 January 2001, these protected areas amounted to 486,578 hectares, or 3.47 per cent of the Republic's territory. In addition, *ex situ* conservation of genetic resources occurs at Tajikistan's five botanical gardens, two stations, four base points and seven substations where complex biomorphological, ecological, physiological, biochemical, anatomic, phytocenotic, floristic, and other research is undertaken.

The Red Data Book of Tajikistan, which details the state of its rare, endangered, and disappearing species of plants and animals and on the basis of which scientifically-grounded recommendations and concrete actions for the conservation, reproduction, and sustainable use of biodiversity are developed.

It is prohibited to gather plants or to catch and hunt species listed in the Red Data Book under existing legislation ("On Protected Areas" and "On the Animal World") unless a joint decision of the Permanent Commission on the Red Data Book of Tajikistan and the National Focal Point on biodiversity allows otherwise.

Tajikistan signed the CBD in 1997. The government has subsequently taken a number of actions to implement the CBD, including establishing a special Governmental Working Group, with multi-stakeholder representation, to elaborate and develop the National Strategy and Action Plan on Biodiversity Conservation (NBSAP) of the Republic of Tajikistan.

The NBSAP was successfully completed and approved by Decree No. 392 with effect from 1 September 2003. Currently the implementation of the NBSAP is under the initiative of the National Focal Point of the National Biodiversity and Biosafety Centre, established by the Government of Republic of Tajikistan. The National Biodiversity and Biosafety Centre performs the monitoring of proposed measures and controls their implementation by various organisations and authorities.

4.4.3 The Legal Framework

Tajikistan's Constitution establishes the legal basis for the protection, preservation, and sustainable use of biodiversity of Tajikistan. The law "On Nature Protection" (27 Jan 1993) is of particular importance for the conservation and the use of biodiversity. It calls for the promotion, formation, and fostering of the ecological legal framework in order to protect biological diversity in the interests of present and future generations. Other relevant laws that have been adopted include the laws on fauna protection and use (1994); protected areas (1996); the Forest Code (1993); the Land Code (1996); the Water Code (2000); and a special section of the Criminal Code (1998).

There are also various statutory acts on hunting and the hunting farms (1997); the state ecological expertise (1994); the rate for definition of fines for violation of the legislation of the Republic regarding the protection of fauna and flora (1996 and 1997); and the rate for calculation fines for illegal catching or destruction valuable species of fish (1995). Other relevant measures include the State ecological programme for the period 1998–2008 (1997); and the State programme on ecological education for the period 1998–2010 (1995).

For the effective implementation of the planned actions, certain measures will have to be integrated into Tajikistan's general development strategy. Improvements will also be required in the system of environmental control and management and in interdepartmental interaction. Implementation of the NBSAP according to schedule will, to a certain extent, be dependent on obtaining foreign investment and the support of international organisations.

4.4.4 Access to Genetic Resources

Tajikistan has considerable unused potential and capacity with respect to genetic resources. All stakeholders, including private and public sectors, scientific research institutes, and organisations, have rights to access to genetic resources for purposes of reproduction. There are restrictions on the gathering of herbs and food plants, fishing, and hunting of animals and birds, including big mammals and birds of prey. Although access to genetic resources is to some extent regulated within the framework of the general ecological legislation, the Custom Code and Red Data Book of Tajikistan, there is not as yet any legislation specific to ABS.

Framework Agreements with Russia, Uzbekistan, Turkmenistan, India, and some other countries offer some measure of control with respect to access to genetic resources. However, a great amount of genetic resources gathered in Tajikistan over the years remains in the Russian Institute of Plant Breeding.

The Custom Codex regulates access to genetic resources by foreigners, but in light of internal and external changes, there appears to be a need to pass new legislation. Tajikistan has recently adopted the law "On Intellectual Property Rights". Intellectual property rights are also regulated in the framework of the special agreement between Russia and Tajikistan on the exchange of scientific and technical information.

A network of the institutes of the Academy of Sciences and branch institutes of the ministries and departments, including the Biodiversity Office, are engaged in work on the conservation and use of biodiversity. Partnerships have been established with the scientific institutions of Russia, Uzbekistan, and EU countries to work in this area. Such international partnerships will contribute to the development of Tajik expertise in this area. Tajikistan is planning to become a member of the International Centre for Genetic Engineering and Biotechnology (ICGEB).

A process of managing biodiversity conservation information and monitoring has been initiated but the data, not all of which is in electronic version, has yet to be analysed and systematised. Tajikistan also intends to become a party to the WTO.

4.4.5 Traditional Knowledge

The indigenous population and local communities of Tajikistan are holders of traditional knowledge relevant to the conservation and utilisation of genetic resources in Tajikistan. A partial inventory of traditional knowledge has been conducted by the Academy of Sciences and Tajik Agricultural Academy and there has been some surveys made on access to genetic resources and benefit-sharing.

4.4.6 Biosafety

The Cartagena Protocol on Biosafety was ratified by Decree No. 932 of the Parliament of the Republic of Tajikistan on 22 October 2003 and was submitted to the Secretariat of the CBD. Although a number of laws, including environmental laws and laws on health, sanitary and quarantine issues, touch on the issue of biosafety and biotechnology, there is as yet no specific legislation on biosafety. There is legal provision for the registration of GMOs but new legislation is required to further processing and monitoring. The Government has appointed an Intergovernmental Committee for the Cartagena Protocol on Biosafety (ICCP) National Focal Point.

Participants at a multi-stakeholder Biosafety Roundtable, held in May 2002, highlighted a number of priority areas requiring action. These included the need to harmonise national legislation with international agreements and the requirements of the Cartagena Protocol; and to prepare legal regulations

to control export and import, storage, transportation and packing of products containing GMOs.

Participants also highlighted the need to consider potential economic loss due to unsanctioned import of genetically modified organisms; and to foster quarantine and customs services for products potentially containing genetically modified organisms and their components. The need to train experts and specialists and to expand scientific research in the field of biotechnology and biosafety and the control of the quality of GMOs were also identified. Specific mention was made of the need for databases on GMOs, and on Tajik scientific institutions and experts in the field of genetic engineering and biotechnology and for greater international co-operation.

It was suggested that the specialised institutes of Academy of Sciences of the Republic of Tajikistan and Tajik Academy of Agricultural Sciences should organise information exchange within the framework of a biosafety clearing house mechanism and investigate the use of biotechnology and genetic resources on the basis of equitable benefit-sharing. The initiative is aimed at biological diversity conservation and ensuring ecological and food safety; as well as providing the public with trustworthy information on national and imported GMO products.

Tajikistan has identified as priorities a full and systematic inventory of the genetic resources; evaluation of the bio-resource potential of the republic and the provision of a regulatory and legislative basis for its sustainable use; improved legislation on access to genetic resources and benefit-sharing; the adoption of laws on biosafety and the regulation of biotechnology, import, export, transportation, packing, and storage of GMOs; conservation of flora and fauna and improvement of the ecological balance by creating a network of protected areas; as well as measures to conserve the diversity of cultivated plants, animals, and their wild relatives; the creation of the network of agro-ecosystems and optimisation of urban territories.

Finally yet still importantly is the need to create partnerships in order to develop and attract the necessary resources for the conservation and sustainable use of biodiversity. In developing legislation and forming a legislative and administrative basis for biosafety provisions, Tajikistan is considering the views of all relevant stakeholders. The drafting of relevant legislation has already started.⁵⁴

4.5 Turkmenistan⁵⁵

4.5.1 Biological Resources and Environmental Pressures

Turkmenistan's biological diversity reflects the unique characteristics of its landscape diversity,

with 80 per cent being desert or semi-desert. At the conjunction of three large floristic provinces—the Kopetdago–Horasan, the Montane Central Asian, and Turan—with two transitional regions (Badkhyz and Karabil), Turkmenistan exhibits the features of the Central Asian, Mediterranean, and Turan desert floral landscape. Natural ecosystems have played a key role in helping conserve the country’s rich biodiversity of more than 20,000 recorded species, including 7,000 plants and 13,000 animal species, of which over 12,000 are invertebrates.

Turkmenistan is also characterised by the existence of a large number of restricted-range species, endemics, and wild relatives of cultivated plants and domestic animals. These ancestors include barley, oats, rye, onions, almonds, pears, walnut, pomegranate, and mulberry as well as the Tadjik markhor, the Turkmen wild goat and the kulan, the only representative of the equus genus preserved in the wild in Turkmenistan. These are important reservoirs of genetic material for the development of new cultivated breeds and varieties and for valuable medicinal herbs.

A number of commercially valuable fish species, including sturgeon, are also found in the Caspian Sea and the rivers of Turkmenistan. A growing number of species of plants and animals of Turkmenistan’s rich and diverse fauna and flora are of economic importance in the medical and food sectors; perfume manufacture, hunting and fishing. About 600 are being used in the perfume industry, 700 in foodstuffs, 160 in the dyeing industry, nearly 50 containing potash liquorice is an economically important plant as are the 5 per cent of Turkmenistan plants used as dyes. Measures have been taken recently to restore and reintroduce ancient natural dyes into the carpet industry.

As elsewhere in the region, the biodiversity of Turkmenistan is under pressure as a result of the destruction and degradation of habitat, over-exploitation and the introduction of non-native species, soil erosion, and salination. The Red Data Book of Turkmenistan published in 1999 lists one in every seven vertebra species. The turanian tiger, cheetah, and woodpecker have already been lost.⁵⁶

4.5.2 Environmental Law and Policy

The Ministry of Nature Protection is mandated to oversee environmental protection as well as the development of the national forest estate. [A state inter-ministerial committee, chaired by the Ministry of Environment and Agriculture, was established in 1999 by Presidential Decree to coordinate the development and implementation of the National Environmental Action Plan (NEAP). The NEAP is a permanent planning document, with a special working group on biodiversity conservation, and forms an integral part of the Presidential Programme “Strategy of Socio-

Economic Reforms in Turkmenistan for the Period Until 2010”.

Turkmenistan has a significant body of legislation relating to biodiversity including laws on Nature Protection (1991), State Specially Protected Natural Areas (1992), Interior of the Earth (1992), Protection and Rational Use of Flora (1993), State Ecological Expertise (1995), Atmospheric Air Protection (1996), Hydrocarbon Resources (1996), and Protection and Rational Use of Fauna (1997). Turkmenistan has also established Forest (1993) and Sanitary (1992) Codes which have a bearing on biodiversity conservation as do the national standards on Environmental Impact Assessment (EIA) which were adopted (2000) in anticipation of the environment being subjected to anthropogenic pressures in the near future.

Turkmenistan’s NBSAP, developed with multi-stakeholder participation and overseen by the State Commission, provides the mechanism to fulfil obligations under the CBD. The NBSAP identifies priorities including increasing protected areas and ensuring their effective management; the revision and development of nature protection laws in accordance with the CBD and the elimination of gaps in existing legislation; the improvement of the conservation of agricultural biodiversity and *ex situ* conservation of genetic resources; and enhancing the role of traditional knowledge in resolving the problems of rational use of genetic and other resources. Turkmenistan has faced challenges in conserving agro-biodiversity and species diversity in their places of origin

4.5.3 Access to Genetic Resources and Benefit-Sharing

Some research on genetic resources has been undertaken in Turkmenistan including by the Botanical and Zoological Gardens; the National Institute of Deserts, Flora and Fauna of the Ministry of Nature; and by various institutes within the Ministry of Agricultural Protection. Zapovedniks, which have the legal status of scientific research institutes, conduct research on *in situ* biodiversity conservation. *Ex situ* conservation has been carried out by the Ashgabat Botanical Garden that maintains a seed bank of nearly 3,000 species, and the Garrygala Scientific and Experimental Centre of Plant Genetic Resources.

Since the break up of the Soviet Union, Turkmenistan’s access to genetic resources in other countries has been interrupted and vice versa. Garrygala, with support from the McArthur Foundation, has developed an inventory of plants status and a databank of genetic resources but it is limited in terms of internet access by a lack of technical equipment. The Centre is co-operating with the International Plant Genetic Resources Institute in the development of plant genetic conservation projects.

Efforts are being made to obtain international assistance to maintain a certain level of participation in international exchanges of information and data, particularly with respect to the development of regulations for data sharing and joint use of exported biological and genetic materials, for the safe use of genetically modified organisms and on the development of an ABS strategy.

4.5.4 Traditional Knowledge

Natural resources, including plants and animals, have long been highly valued by the people of Turkmenistan and there is a strong tradition of the use of medicinal plants by wise men (*tebibs*)

as remedies for different diseases. Using methods transmitted from generation to generation, the folk healers (*tebibs*) are held in high esteem. Traditional sources and practices that have been in use for many years are extremely instructive and research on local medicinal plants has resulted in the discovery of many valuable substances. Intellectual property rights are protected under “The Civil Code of Turkmenistan” (1998) and “The Patent Law of Turkmenistan” (1993). Turkmenistan is not a member of the WTO.

4.5.5 Biosafety

Despite biotechnology’s growing importance, Turkmenistan has undertaken no special work

BOX 3

Local Experiences in the Preservation of Traditional Knowledge

P Keldjayev⁵⁷

During the 70-year period of the Soviet Regime, *tebibs* (folk healers) were prohibited from treating patients. Therefore much traditional knowledge about treatment and precautionary methods of healthcare, which had previously been conveyed from father to son, is almost forgotten. It was only after general Central Asian independence that traditional treatment by *tebibs* was gradually revived.

Currently, folk healers—*tebibs*—work outside the legal sphere and the “Law on the Citizens’ Health Protection” approved by a special resolution of the President on 12 December 2002, does not mention *tebibs*. Based on this law, the Ministry of Health of Turkmenistan issues licences for the manufacturing of officially approved curative products. Official approval means that the product has to pass clinical tests. Licences are issued for the opening of private clinics and the trading of medicines and medical equipment, etc. *Tebibs* are not eligible for such a licence.

The Ministry of Health issues only a ‘permission’ to *tebibs* after their registration with the Department of Public Healthcare to allow them to carry out their healing activities. The following terms have to be observed by the *tebib*:

- A *tebib* has to prove his capability to successfully treat specific ailments;
- Places where patients are being treated must meet strict sanitary regulations;
- A *tebib* is not entitled to specify tariffs for his services; he should be content with the payment offered by the patient (*el aklygy*);
- A *tebib* is entitled to treat patients only within his proven area of competence .

Currently more than 200 *tebibs* in Turkmenistan have received this permission from the Ministry of Health. They are exempt from paying taxes and convene annual seminars, which are organised mainly by the Institute of Medicinal Remedies. A *tebib* can be granted protection for a newly developed medicine only after it has undergone clinical tests. At pharmaceutical faculties of medical institutes in Central Asia, students are taught a special course in herbal lore and traditional medicine.

In some hospitals, a special effort is made to collect herbs for the production of herbaceous decoctions, tinctures, etc, and these are applied in combination with conventional treatment. For example, in Turkmenistan, a new Institute of Medicinal Remedies has been opened, which produces medicines on the basis of plants and natural remedies, utilising traditional medicinal knowledge.

The principal areas in which modern *tebibs* operate are: treating fractures, dislocations, tension, herniated disks; offering common and acupuncture massage; blood-letting; herbal lore specialising in skin, internal, female and other diseases.

The rich experience and knowledge of *tebibs* may be considered a national heritage. There is a need for it to be studied, appreciated and augmented in order for it to be preserved for future generations. To improve the work of folk healers and to facilitate legal recognition of their rights the following measures have been recommended:

- Evaluate and disseminate comparative experiences of protection of traditional knowledge in other countries;
- Establish public organisations or clubs in partnership with government structures;
- Hold international annual training seminars with *tebibs*;
- Organise national courses for *tebibs* aimed at training and improving their skills and exchange of information;
- Document and publicise the *tebibs*’ accumulated experience and knowledge in a special booklet called “*Tebibs*”;
- Secure exchange of experience between folk healers and representatives of scientific medicine;
- Form an international state committee for the development of traditional medicine and knowledge with the right to issue professional certificates to *tebibs*.

The issuing of *Tebib* Certificates, as well as the supervision of a *tebib*’s professional growth, will permit the state to positively solve the problem of licensing folk healers’ activity by legitimising their activity.

on biotechnology or research on GMOs and their products, due to financial and other limitations. Currently there is a lack of administrative and science capacity for liability, monitoring, and control and of administrative standards. Specific laws on biosafety have yet to be developed. At present, several authorities including the Customs, Plant Quarantine Inspectorate, and “Caspecocontrol” are responsible for preventing the influx of alien species. These organisations may also be tasked with risk management and risk assessment related to GMOs. Turkmenistan is currently considering the ratification of the Cartagena Biosafety Protocol and is interested in participating in the UNEP/GEF Project on the Development of National Biosafety Frameworks.

4.5.6 The Challenges of Implementation

Turkmenistan’s NBSAP sets out a number of legal and policy reforms necessary to advance CBD commitments and obligations such as the development of laws on biosafety and the use of genetically-modified organisms; the fair and equitable sharing of benefits arising from biological and genetic resources and mechanisms to ensure the application and enforcement of such laws and existing procedural and institutional rules.

Turkmenistan has maintained a wealth of basic research material as part of the country’s national heritage and has a substantial research infrastructure that enables it to conduct research programmes. More recently, the loss of qualified staff and the inability to attract external funding for biodiversity management and conservation are said to have had a negative impact on the quality of conservation research and the management of biodiversity conservation activities. The poor research and development facilities of *zapovedniks*, including a shortage of transport, lack of computers, and modern communication facilities, hinders the compilation of data sets and efficient data exchange.

Methods for evaluating the economic significance of genetic resources have yet to be developed and these resources therefore remain undervalued. As a result, conservation issues tend not to have been integrated into development plans. Legal reforms and policy changes are needed in order to bring Turkmenistan’s legal regime into closer conformity with the requirements of the CBD. Provision for these reforms are made in the NBSAP. Considerable effort has also been devoted to maintaining international co-operation and financial and technical assistance especially in the areas of data exchange and regulation; the development of a legal and regulatory biosafety framework; and a strategy for ABS.

Another area that Turkmenistan has identified as needing urgent attention is that of enhancing public awareness of environmental issues. Such awareness

amongst local populations is a key element of the successful conservation of natural resources.

4.6 Uzbekistan⁵⁸

4.6.1 Biological Resources and Environmental Pressures

Uzbekistan has a rich diversity of flora and fauna, reflecting not only its geography but also its climate that varies from subtropical to abruptly continental with significant daily and seasonal fluctuations. The biodiversity of Uzbekistan includes more than 27,000 species, of which over 15,000 are animals and about 11,000 are plants, fungi, and algae. Uzbekistan is an important habitat for endemic animal species of Central Asian origin. Although less than 10 per cent of plant species are endemic, there is an endemic rate of 52 per cent for fish. Uzbekistan’s fault-line reservoirs and reed beds are stopping-off places in the migration of waterfowl and nesting and habitation sites.

The desert ecosystems of Uzbekistan, which comprise 85 per cent of its territory, can be classified according to whether they are sandy, saline, clay, rocky, or detritus deserts. These ecosystems are home to rare and endangered species of animals such as the Indian hihi, caracal, goitered gazelle, teal, snake eater, imperial eagle, griffon, saker falcon, bustard, and the pin-tailed sand grouse.

More than 937 plant species found in the Kizilkum desert alone and more than 50 per cent of the 320 flower species found in the sandy deserts are endemic. The rocky deserts are home to a large number of species of reptiles, birds, and mammals. Some 304 plants species are found in the saline deserts with 4 per cent being endemic to Uzbekistan and 26 per cent endemic to Central Asia. Clay deserts, where the middle Asian turtle, lizards, and chasers are found, are disappearing because of human habitation.

The high mountain zones, for example, are home to 110 alpine species of short-grass flora, of which 40 are endemic to Central Asia. In the case of river ecosystems, significant masses of tugai (gallery forest) are preserved in isolated icelands or narrow strips in valleys and deltas.

All types of game hunting, commercial, and otherwise, are regulated although habitat destruction has brought commercial trapping to a virtual halt in the Aral Sea region and the Amu–Daria river delta. Tourism to date has been focussed on places of historical and cultural importance and only now is the potential of eco-tourism being recognised as both an economic activity and a means of generating resources for biodiversity conservation.

Uzbekistan’s biological diversity is under threat, particularly from anthropogenic factors. These include changes in land use and greater economic activity in the mineral and energy sectors and the increase

of irrigated agriculture. In the last few decades, ecosystems that have formed around artificial reservoirs, have been the most important factor in the conservation of wetland birds and waterfowl and provided some compensation for decreased fish stocks in natural reservoirs.

4.6.2 Environmental Policies and Programmes

Uzbekistan has developed a national biodiversity strategy, which was approved by the government in 1998. The strategy evaluates for the first time the state of biodiversity in the country and analyses its conservation and utilisation potential. Priority actions are defined and a ten-year national plan of action has been developed on the basis of the strategy. The plan, which is to be supplemented after the first five years, addresses five main areas: the system of specially protected areas; public awareness, participation and education; the sustainable use of biodiversity resources; local biodiversity action plans; and the coordination of international relations and assistance in the field of biodiversity.

A number of pilot projects have been undertaken with respect to the organisational structure of the protected areas systems; capacity development for protected areas; biodiversity information and data for decision-making; and the development of a biosphere reserve (in Nuratau). In 1999, Uzbekistan also adopted an "Action Programme on Environment Protection".

A National Commission on Biodiversity composed of representatives of ministries and agencies responsible for the conservation and sustainable use of biodiversity has been established under the State Committee for Nature. This Commission works according to annual plans formulated in conformity with the Action Plan and is responsible for the five-year review of the plan and the development of a new plan.

Work has been undertaken with support from the GEF (the Central Asia Transboundary Project on Conservation of Biodiversity of Western Tien-Shan), UNDP, the Secretariat of the Ramsar Convention, and other international government and non-government partners on the sustainable use of biodiversity, in particular with respect to wetlands and including the artificial breeding of endangered species. A national system of protected areas is in place. This includes national parks, conservation areas and monuments, the latter two acknowledged as being relatively small in size, amounting to 4.6 per cent of Uzbekistan's territory. However, only 1.8 per cent complies with World Conservation Union (IUCN) Categories I and II i.e. strict and long term conservation.

Ex situ conservation is also carried out by institutions such as the Botany Science and Production Centre; the Plantation Institute; the Institute of Genetics and Experimental Biology of Plants housing collections of biological materials.

BOX 4

Erosion of Genetic Resources in Vavilov Centres for Genetic Resource Collection in Central Asia

All the countries in the region expressed concern that the impediments they are facing in protecting their biodiversity are exacerbated by the fact that collections of biological and genetic resources of many of the countries of the region remained in Russia, mainly in the Vavilov Centre in St Petersburg after the break-up of the former Soviet Union. This has impeded the ability of scientists and researchers to access this source of knowledge, and may also hinder effective control of national resources and exercise of sovereign rights as countries of origin over the use of genetic resources. Between 1946 and 1965, the Vavilov Centre carried out 130 collection missions in various regions of the Soviet Union, including Central Asia.⁵⁹

The fully functioning gene bank in Uzbekistan was established in the building of the former Central Asian Vavilov Centre near Tashkent, in co-operation with the regional centres of ICARDA (International Centre for Agricultural Research in the Dry Areas) and CGIAR (Consultative Group on International Agricultural Research) for Central Asia and the Caucasus.⁶⁰

Limited financial resources present a major obstacle in maintaining gene banks in countries of the former

Soviet Union.⁶¹ The Vavilov Centre in St Petersburg, the third biggest gene bank of the world was founded in 1894.⁶² After the end of the Soviet regime, maintenance and financing for a wide network of academic institutes dried off. The unique collection, mainly collected during the 1920s and 1930s comprises some 340,000 domestic plants and their wild relatives. Almost one third cannot be found outside of the Centre anymore. The World Bank estimates the Vavilov Centre's value for the conservation of global biodiversity at \$US8 billion. The basic subsistence budget of the Institute amounts to US\$3 million per year, but the Centre is only being allocated \$US1.5. The rest has to come from renting out facilities and locations of the centre.⁶³

Based on geographical and other properties of the fodder crops growing in a certain location, pastures are divided according to seasonal suitability, whether they are near or far from a nomadic camp, whether favourable for good weather or bad weather grazing or for every day use. This traditional knowledge of both pasture and terrain forms the basis of modern animal husbandry.

Progress has been made with respect to local biodiversity action plans, with plans now being implemented in Jizak, Fergana, Khorezm, Kashkdarya, Tashkent and the Samarkand province.

4.6.3 The Legal Framework

There are a number of pieces of legislation relevant to ABS. These include: the Law on Forests; Law on Protection and Rational Use of Fauna; Law on Protection and Rational Use of Flora; Land Law; Law on Nature Protection; Law on Special Protected Areas; Law on Water and Use of Water) in addition to laws on environmental protection, fishery, hunting, endangered and rare species which also touch on these issues. Administrative, criminal, civil, disciplinary, and economic penalties and sanctions for violations are provided for.

4.6.4 Traditional Knowledge

Traditional knowledge is an integral part of sustainable development but remains undocumented. In Uzbekistan, traditional knowledge is widely applied with respect to medicinal plants and food, although regional differences exist, but with respect to animals and animal products, domesticated animals have largely replaced wild animals. However, there has been no research on traditional approaches to access and community benefit-sharing.

The Constitution of Uzbekistan provides for the protection of intellectual property. Part IV of “Intellectual Property” of the Civil Code of the Republic of Uzbekistan addresses intellectual property in a comprehensive manner. Uzbekistan is a member of WIPO and plans accession to UPOV.

4.6.5 Biosafety

In the case of biosafety, the regulatory framework is as yet embryonic and reorganisation of administrative and institutional mechanisms is said to be required. Uzbekistan has done some research in the biotechnology area but does not yet produce GMOs and quarantine services at present apply only to imported species of plants, seeds, and animals. In the country report, it is suggested that it is possible to import GMOs into Uzbekistan, but as of the time of publication, there had been no official declarations of imports of GMOs by official government bodies. There is little experience with transboundary access with respect to genetic resources and such transfers are regulated only by customs legislation.

5 Capacity Development Needs

5.1 Identifying Capacity Development Needs

Whether considered individually or as part of a region, the countries of Central Asia and Mongolia are not alone in the challenges they face in implementing their CBD obligations, in conserving and sustainably using their biological resources and in establishing a fair and equitable system of ABS and achieving biosecurity. Around the globe, Parties to the CBD have identified the following as problems in the biodiversity planning process:

- Inadequate political support for crucial aspects of the planning and approval processes
- Weak legislative base
- Inadequate information
- Lack of appropriate scientific and technical expertise and experience in biodiversity planning
- Lack of institutional coordination within Governments and between Governments and stakeholders
- Difficulties in accessing and availability of funding
- Direct economic pressure on ecosystems and a lack of national budget allocations
- Need for increased public education and awareness
- Need for recognition of the long term nature of the NBSAP process
- Complexity of translating a biodiversity strategy into a costed and prioritised action plan
- Scarcity of examples of the effective integration of biodiversity considerations into sectoral or cross-sectoral planning

While the order of magnitude may vary, these are essentially the same challenges and priorities for action identified by the countries of the region.

The conclusions of both biosecurity workshops as well as the country reports that have been prepared by the Central Asian countries and Mongolia, identify crucial regional capacity development needs. These include the need for:

- more robust legislation in support of the conservation and sustainable use of biological resources;
- development of regulatory and policy regimes to respond to threats to ecosystems and to socio-economic changes and concerns about biosafety;
- expanded protected areas and enhanced management and information systems;
- for greater investment in scientific and technical research and in human resources.

The countries all face staffing shortages with an attendant negative impact on the management of protected areas, the ability to conduct research and to implement policies.

5.1.1 Political Support

Although none of the countries of the region have cited inadequate political support for the planning and approval processes as an obstacle to implementation of the CBD, several, including Tajikistan have noted that their respective NBSAPs have yet to receive legislative approval.

As with many developing countries, countries with economies in transition face a multitude of development problems which frequently overshadow environmental concerns. For instance, large sectors of the population in the region live on less than US\$2 a day.⁶⁴ Although awareness of the importance of biodiversity conservation is prevalent, there is a greater focus on poverty alleviation when it comes to the allocation of scarce resources. For many countries, biodiversity conservation and implementation of ABS legislative frameworks will receive heightened attention if their relevance for poverty alleviation can be evaluated and promoted.⁶⁵

It is perhaps indicative of the failure of the CBD to demonstrate its importance for poverty eradication, that most of the countries have not allocated funds towards paying their CBD membership fees, in some cases for several years. This in turn severely hampers their participation in international negotiations, as the countries cannot afford to send their representatives to international meetings without financial support of the CBD, for which they are not eligible without paying their membership fees.⁶⁶ The result is the virtual absence of a voice of the region in relevant international negotiations on ABS and other CBD-related issues.

5.1.2 Legislative Base

All countries in their reports cite the need to strengthen the legislative base. Even those countries like the Kyrgyz Republic, Tajikistan, and Turkmenistan, who have referred to the presence of a strong legal base, state that there is a need to build on and enhance the existing legislative framework. If, as Tajikistan suggests with respect to fiscal incentives, the use of market-based economic mechanisms and incentives is envisaged as a means of advancing environmental goals and objectives it is likely that new legislation will be needed.

The need to strengthen the legislative basis also featured prominently among the capacity building needs identified during both biosecurity workshops. All countries stated that they have virtually no legal structure to deal with access to genetic resources and benefit-sharing and the protection of traditional knowledge.

The countries have identified the need to analyse international experiences in creating ABS frameworks as well as the need to harmonise existing international legislation with domestic law, e.g. identifying gaps, etc.

During “Biosecurity II”, the participants identified the following capacity building needs to strengthen the legislative basis in the area of ABS:

- Identification of the state body responsible for ABS;
- Identification of mechanisms to support ABS;
- Increase of the institutional capacity and profile of governmental bodies responsible for nature protection;
- Ensure transparency for civil society;
- Necessity to co-operate on regional level through developing common standards for providing access to genetic resources and benefit-sharing;
- Need to examine the potential benefits of developing a regional agreement on access to genetic resources and benefit-sharing and mechanisms of its execution.

With respect to biosafety, no laws currently exist in the Central Asian countries or Mongolia to govern trans-boundary GMO movements, outdoor tests, or the importation and consumption of GMOs. Analysing the probable risks and possible benefits of GMOs, the participants of “Biosecurity II” expressed concerns that the use of GMOs might become a threat to agricultural science and traditional knowledge, create dependency on GMO suppliers, and thus exclude local traditional products from local markets. They were also concerned about GMOs putting the endemic biodiversity, ecosystems and species at risk.

During the “Biosecurity II” workshop, it was proposed that a working group of lawyers and specialists on the regional level should be established. This working group would enhance capacity to analyse national laws and their compliance with international agreements on biosafety, elaborate procedures and mechanisms to certify biotechnology centres, discuss import regulations for GMOs, and make recommendations to national policy makers.

Furthermore participants deemed it necessary to:

- Identify the respective authorised governmental bodies in the region;
- Estimate the potential in the region for import and use of GMOs;
- Have better access to resources;
- Collect information on the use of GMOs in countries of the Region and
- Detail import and distribution control criteria for GMOs.

5.1.3 Inadequate Information

Inadequate information is a common concern throughout the region. An appropriate policy and regulatory framework is dependent, *inter alia*, on analysis based on reliable and scientifically sound information. Inadequate and incomplete information therefore hinders its development. Monitoring and assessment are key to understanding the effectiveness of policies and their implementation, whether the knowledge and information is purely scientific e.g. changes in habitat and animal populations or relates more to behavioural change such as citizen involvement and assumption of shared responsibility for the environment.

In the region, inadequate information reflects a lack of funding more than a lack of understanding of its importance. Many of the countries cite the inability to maintain existing data banks and well as the impossibility of expanding them to ensure that they are truly representative of their respective ecosystems and the biological resources therein. Another frequently cited limitation is the ability to access the Internet. UNEP-GEF stated that, in responses to the questionnaire on assistance needs to access the Biosafety Clearing House (BCH), 25 per cent indicated a lack of hardware, 50 per cent needed training in information management, 61 per cent a need for training in using the BCH, and 20 per cent indicated a greater need for information about the BCH.⁶⁷

Participants of the “Biosecurity II” workshop stated that the main problems of access to information are:

- Difficulty to determine the main information holder;
- Unclear or no classification of information;
- Information about research and databases is often not shared;
- Information flow to and from electronic data storage is insufficient;
- Absence of information networks among different departments;
- Weakening of the quality of training for professionals ;
- Insufficient information exchange among regions;
- Insufficient knowledge among the population on rights to access information.

To improve this situation the following measures are recommended:

- Institutional and organisational capacity building;
- Scientific capacity building;
- Increased co-operation among government entities;
- Analysis of distribution methods;

- The creation of interdepartmental ecological networks; ,
- Increased access to the internet;
- The creation of databases and the provision of new information material by the SCBD.

5.1.4 Support for the Conservation and Protection of Traditional Knowledge

Traditional knowledge is understood by the countries of the region as being an integral part of their culture and history. It is seen as a basis for innovation and the creation of new technologies with specific relevance for sustainable development. It can help to promote and set examples for the sustainable use of biological resources and their conservation.

In order to ensure indigenous peoples and local communities' rights over their traditional knowledge and technologies, the participants of the workshop "Biosecurity II" identified several crucial steps to encourage local communities to continue using and developing their traditional knowledge and to pass it on to future generations.

These include the establishment of regulations for benefit-sharing mechanisms along with national rules and procedures on the use of traditional knowledge and awareness raising of the importance of TK and of the rights of indigenous peoples and local communities over TK, both within the general public and among policy makers. There is a need to promote a dialogue between government bodies, local communities and consumers and of mutually beneficial relationships between TK holders and scientific institutions. It has been suggested that existing IPR laws may need to be amended in order to protect the rights of TK holders.

The participants at the "Biosecurity II" workshop identified a need for regional co-operation to protect the rights of indigenous people and local communities over their TK, and to provide access to information, decision making and justice where use of TK is concerned. Another suggestion was to establish a competent state body to safeguard rules and agreements on the use of TK ideally established between local communities and state bodies.

It was further recommended that research be conducted with the participation of indigenous people and local communities to create knowledge, experience and opportunities for protecting TK including development of a database on TK at local and national levels to provide assistance to local communities to recover and develop their TK. Education and training, access to information and the creation of a legal base are important conditions for securing broad and effective involvement of representatives of indigenous and local communities in decision-making processes.

5.1.4 Scientific and Technical Expertise

In terms of scientific and technical expertise, the capacity of the countries of the region to develop and implement appropriate policies with respect to biodiversity, ABS and biosafety has been impacted by the fracturing of the scientific and research system previously in place throughout the former Soviet Union. At a time of financial difficulties such as are being experienced in the region, the break up of this system has only compounded the challenge of maintaining and/or expanding the expertise that existed previously.

5.1.5 Institutional Coordination: Mainstreaming Biodiversity

One of the challenges faced not only in the region but also around the globe is that of integrating environmental and economic considerations both at the abstract and policy level and in terms of cross-sectoral engagement and commitment. Most countries of the region recognise the importance of integrating biodiversity into other sectors, in particular agriculture and forestry, e.g. through land use planning systems or ecological legislation addressing the use of natural resources and quotas, permits and licenses for hunting, fishing and gathering of medicinal plants.

The extent of policy coordination and multi-stakeholder engagement, however, varies throughout the region with some countries having established government commissions responsible for ensuring integration while in others there appears to be a lack of sufficient coordination.

Regarding economies in transition, no single sector stands out alone as having the greatest impact on biodiversity. However, several countries including Mongolia specifically state that a lack of success in getting environmental considerations incorporated into the policies and programmes of other ministries makes implementation of biodiversity goals difficult. The Republic of Kazakhstan and Uzbekistan also point to the need for greater co-operation between all interested parties if biodiversity goals are to be achieved. Lack of coordination between stakeholders is cited as a barrier to successful implementation of national law and policy and the importance of political support and public awareness and engagement must be highlighted.

5.1.6 Public Education, Participation and Awareness

All countries of the region identify a the lack of awareness, combined with increasing impoverishment of large parts of the population as one of the major factors for continuing and increasing loss of biological resources. There is a need to enhance

public awareness on the importance of biological diversity and traditional knowledge for local and national subsistence, sustainable development and food and health security. There is also a need to build awareness of international environmental agreements, such as the Cartagena Protocol, the Bonn Guidelines, the Aarhus Convention on information access, public participation and decision-making processes and access to justice on issues related to environment and on the importance of traditional knowledge for the preservation and sustainable use of biodiversity. As part of this process, countries of the region recognise a need to develop national education programmes and to create a uniform methodological framework to conduct training for trainers.

Some of the countries, Mongolia and Uzbekistan, for example, make specific mention of the involvement of civil society, including local communities in the development of NBSAPs, but they also note that there is more to be done in this regard. In many cases, the local communities are the custodians of knowledge of a habitat and its biodiversity. Close relations between these communities and policy planners can not only help in the development of sound and well thought out policies but can also do much to give a sense of ownership of relevant law and policy thus increasing the chances of successful implementation.

Several countries, even those with an active environmental education programme such as Tajikistan and Uzbekistan, acknowledge the need for increased public education and awareness to build this support for action. Turkmenistan, for example, has identified the need to increase public awareness of environmental issues as urgent .

5.1.7 Financial Limitations

All countries of the region highlight financial limitations faced by their respective government and the difficulties they experience in accessing funding. There are some international projects underway for which multilateral and bilateral partners are providing funding and much is made of the potential to access funds under the Cartagena Protocol, with several of the countries already engaged in projects aimed at preparing them for accession to the Protocol.

However, the shortage of financial resources also affects the basic building blocks of biodiversity conservation and policy-making and there is a common reference to the difficulty of maintaining data banks; acquiring the equipment needed for research and information management; managing protected areas; and of recruiting and retaining staff in these areas.

6 The Way Forward: The Central Asia and Mongolia Bioresources and Biosecurity Network

During the “Biosecurity I” workshop, the participants drew up a strategy paper entitled “Practical Measures to Assist CA Countries and Mongolia”. Based on the findings detailed in the paper, the participants decided to formally establish the Central Asia and Mongolia Bioresources and Biosecurity Network as a forum for exchange and co-operation and a means to pool resources.

The objective of this network is to assist countries in maintaining their biological diversity through the exchange of scientific, technical, environmental, and legal information; case studies; and best practices and experiences on issues relating to biodiversity, biosafety, biosecurity, and bioresources. The network will facilitate the implementation of the CBD, and ABS regulations in particular, and is intended to contribute to the creation of an international regime on ABS as called for by the WSSD.

The network will work closely with interested parties in the countries of the region including governmental agencies, NGOs, research institutions, indigenous peoples, and local communities. The network will promote the development of close ties with international, regional, and national organisations to enhance network development.

The network offers both internal and external advantages. Within the region, it will serve as a platform for collaborative research, information exchange, and for consolidation of capacity in the region. Externally, it will heighten the visibility of the region and strengthen its common voice in international negotiation fora. The network has the potential to facilitate access for the countries of the region to the international policy dialogue and negotiations by taking steps such as identifying focal points for relevant processes or conducting training and possibly developing a manual on basic international diplomacy and negotiations. UNU-IAS is supporting the network in these tasks.

6.1 The Priorities of the Network

The participants of “Biosecurity II” decided to identify priority steps for the network for the next two years. Amongst other things, it was agreed to establish an interim secretariat with responsibility for preparing the groundwork necessary for the formal inauguration of the network during the International Mountain Summit to be held in Bishkek in 2005. These priority steps included the following:

1. Formation and implementation of the network
2. Facilitation of information exchange (collection, analysis and dissemination of information)
3. Discussion and research on legislation

4. Education and awareness-raising
5. Establishment and maintenance of a network website

A number of priority actions were also identified to be carried out in the forthcoming two-year period:

- Establishment of a Regional Coordination Council comprised of the representatives of the Central Asian countries and Mongolia to assist and advise the Network Secretariat;
- Elaboration of project proposals for the development of the network;
- Formal recognition of the network by the governments of Central Asia and Mongolia;
- Initial design and further development of a website for the network;
- Preparation of a Central Asia and Mongolia clearing house for information regarding Central Asia and Mongolia and international experience on bioresources and biosecurity issues, databases of governmental organisations, NGOs, civil society, universities, CBOs (community-based organisations), etc.

The Network Secretariat, with technical support from UNU-IAS and in close co-operation with other international organisations, is seeking to develop a programme of activities to respond to this mandate.

6.2 The Network Secretariat

The Kyrgyz Republic was selected to host the Network Secretariat on an interim basis for a period of two years. The Secretariat will be under the auspices of the State Forestry Service of the Kyrgyz Republic with the International University of Kyrgyzstan providing human resources and office space. The Secretariat will be supported by an advisory body consisting of experts of the region and it will act in close co-operation with civil society.

The Secretariat is to operate in an open and transparent mode and ensure the participation of governmental and non-governmental organisations, research institutions and local communities in the network’s activities. With a view to enhancing possibilities for NGO participation in the network’s design and implementation, it was decided during “Biosecurity II” that the Secretariat should invite NGOs from each of the Central Asian countries and Mongolia to nominate a representative organisation to liaise between the Secretariat and the NGO community in each country.

The Secretariat has been charged with a number of duties, including to:

- Organise and promote the network at national,

regional and international levels;

- Mobilise resources;
- Promote the creation of a database of experts and organisations on legislative, administrative, and policy measures undertaken by countries of the region, and on networks of existing collections and scientific institutions working on genetic resources and traditional knowledge;
- Coordinate the elaboration of a long term strategy for the network;
- Attract and co-operate with potential partners;
- Establish links with the respective international organisations and treaties.

The network will co-operate closely with international organisations providing capacity building and training with respect to developing national biosafety frameworks, exploring mechanisms for biosafety risk assessments and increase public awareness on biosafety.

6.3 The Central Asia and Mongolia Website

The Division of Microbiology, Institute of Biology, of the Mongolian Academy of Sciences accepted responsibility for the overall functioning and maintenance of a website for the network in close co-operation with the Secretariat and UNU-IAS.

A model website has been prepared by UNU-IAS at the request of the countries of the region. The website is designed as a bilingual English and Russian site, and will facilitate information exchange and offer interactive features, including the possibility for comments and participation in discussion boards. The site is multi-authored and it will be easy to contribute content to the site, as all that is required of a contributor is to have access to a web browser and an Internet connection in order to submit content to the site, subject to editorial policy.

The purpose of the site is twofold: first, it aims to enhance information exchange and capacity building in the region; second, it aims to secure greater exposure and awareness building at the international level of Central Asian countries and Mongolia, their environment, cultures, interests, challenges, as well as their needs.

6.4 Strengthening the Legal Base

As part of the network's priorities, the representatives of Central Asia and Mongolia emphasised the need to create working groups of specialists, legal experts, and professionals focusing on legal issues pertaining to access to genetic resources and benefit-sharing,

traditional knowledge and technologies, intellectual property rights, and biosafety. Establishment of such working groups is designed to strengthen national capacity to implement international law obligations in national legislation.

These working groups of legal experts and professionals will be requested to analyse existing national and international legislation, identify gaps and develop recommendations for policy makers, regarding the issues discussed earlier, including those related to public participation in decision making in these areas. To this end, the working groups will analyse comparative national and international experiences to be taken into consideration when formulating national legislative proposals. Such working groups may discuss their analyses and recommendations with various interest groups. The working groups may coordinate on a regional level and operate as a network. They should liaise with existing expert bodies on law and policy at the national and regional level.

As a first step towards strengthening the legal base through capacity building, regional workshops and research, UNU-IAS together with international, regional and national partners, is planning to hold a workshop for legal experts of the region in 2004. It is planned that following this workshop, scheduled for the second quarter of 2004, experts will prepare national reports on ABS law and policy for presentation at the planned "Biosecurity III" workshop to be held in Uzbekistan in the fourth quarter of 2004. This will enhance regional and national capacity providing an opportunity for experts from the region to develop their collective skills through the interchange and analysis of national experiences in the light of international legal obligations.

6.5 Increasing Stakeholder Participation in International Negotiations

The strengthening of relevant institutions and human resource development and training, including the development of legal drafting and contract negotiation skills for stakeholders was a key need identified in both biosecurity workshops. Similar capacity development needs were confirmed by the key findings of the Scoping Meeting on Capacity Development Needs for Access and Benefit-Sharing to Genetic Resources conducted by UNU-IAS and UNEP in Kuala Lumpur in October 2002, which highlighted their importance at the global level.

Delegates from countries of economies in transition often do not enter the multilateral environmental negotiating arena with the same level of resources or preparation as their developed country counterparts.

Nor do they readily possess the resources, human or otherwise, to rectify this imbalance. To effectively address this gap, UNU-IAS is planning to hold special briefings and training for the countries of Central Asia and Mongolia before, during, or after relevant meetings including those of the CBD.

6.6 Increasing Information

Amongst the prioritised actions to be carried out by the network over the next two years is the compilation of databases of biodiversity experts, organisations involved in biodiversity, ABS and TK issues, existing data collections on genetic resources, and a list of possible financial resources. This information will be shared through a communication network, driven by experts of information management in the region. The network will develop regional and national projects on creating inventories of biodiversity cooperating with and highlighting existing synergies among projects in this area.

6.7 Increasing International Awareness

The lack of international support currently experienced by the countries of the region stems in part from a lack of awareness by the international community about the situation in Central Asia and Mongolia. It is hoped that this report will play a role in helping to raise awareness about the region's needs in relevant international fora and thereby facilitate greater support of the international community for the region. For example, it could serve as a case study, as called for by the CBD process, especially on the subject of identifying capacity development needs of marginalised regions for the development of ABS law and policy. The means and ways through which the information in this report is most effectively disseminated need to be explored. This report could be an important step to facilitate greater access to and visibility of Central Asia and Mongolia in intergovernmental fora.

Through the formation of the Central Asia and Mongolia Bioresources and Biosecurity Network, the countries of the region have created a platform to help facilitate the development of co-ordinated responses in international negotiations relating to bio-related issues including the negotiation of an international regime for access and benefit-sharing. Strengthening of the regional voice in international negotiating processes will in turn contribute to heightened profile, visibility and access to information and resources to meet regional and national needs. Most importantly for the countries of the region, adopting a co-ordinated position in international negotiating forums will help to promote regional

concerns and help to focus attention on priority issues such as poverty alleviation, food security and biodiversity conservation in landlocked countries with fragile environments.

6.8 Planned Activities

Following up on the outcomes of "Biosecurity I" and "Biosecurity II", a plan of action has been outlined to help secure the consolidation of the Network leading up to its formal launch at the Bishkek Mountain Forum 2005. Amongst the planned collaborations during 2004–2005, the following events are provisionally scheduled:

1. A side event to promote the CAM Network at the Ad-hoc Working Group on ABS in Montreal in December 2003, hosted by the Interim Secretariat and UNU-IAS.
2. A workshop to develop the statutes and necessary documentation for the formal establishment of the Network, hosted by the Interim Secretariat in the Kyrgyz Republic (first half of 2004, supported by UNU-IAS).
3. A workshop for legal experts on ABS, to be organised by UNU-IAS in collaboration with the World Conservation Union (IUCN), Kazakhstan (first half of 2004).
4. A workshop on inventories and databases of genetic resources, organised by UNU-IAS with the support of the International Science and Technology Center (ISTC) (2004).
5. The "Biosecurity III" workshop in Uzbekistan, to be organised by the Institute of Genetics and Plant Experimental Biology of the Uzbek Academy of Sciences, in collaboration with UNU-IAS. This workshop will focus on building capacity in law and policy development-related to ABS and information dissemination and public participation (second half of 2004).

UNU-IAS is working closely to support the work of the Interim Secretariat and the Mongolia Academy of Sciences in the promotion and development of the network its website. UNU-IAS has also sought to secure the support and participation of other international organisations and experts in this capacity development process. Amongst the international bodies providing support for the planned activities are IUCN's Environmental Law Centre in Bonn and the United Nations Environment Programme (UNEP). To date, UNEP has provided both financial and technical support for the UNU-IAS capacity development activities in Central Asia and Mongolia and is an important partner in helping to promote the further development of the Central Asia and Mongolia Network and the CAM Network website.

Annex I: Resolution of the “Biosafety II” Workshop

Access to Genetic Resources, Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia

From 10-13 August 2003, the Kyrgyz Republic hosted a workshop “Biosafety II: Access to Genetic Resources, Benefit Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia”. Representatives of governmental agencies, scientific institutions, non-governmental organisations, international organisations—notably UNU-IAS, ISTC, and UNEP—participated in the workshop. The workshop focused on the following areas:

- Access to genetic resource and the sharing of benefits derived from their use;
- Protection of traditional knowledge and of the cultures which sustain it;
- The conservation of biodiversity, in particular crop diversity;
- The importance of inventories and databases of biological diversity;
- Improving regional collaboration in the scientific community;
- Enhancing capacity to ensure the safe handling of biotechnologies;
- Securing wider participation of civil society in decision making processes;
- Strengthening national law and policy in these areas.

The participants of the workshop stressed their support for the establishment of a network on bioresources and biosecurity in Central Asia and Mongolia. They identified a number of key steps to be taken during the next two years with the intention of making the network operational, and for the development of capacity in the region to carry out inventory of genetic resources, regulate access to genetic resources, and safeguard rights over traditional knowledge. The participants agreed that the official inauguration of the network would take place during the International Mountain Summit to be held in Bishkek, Kyrgyz Republic, in 2005.

Priorities for the Network

1 Formation and Implementation of the Network

The participants developed the following steps in order to form and implement the network:

- Establishment of a Provisional Secretariat and election of an interim Secretary;
- Establishment of a Regional Coordination Council comprised of the representatives of the Central Asian countries and Mongolia to assist and advise the Secretariat;
- Elaboration of project proposals for the development of the network;
- Formal recognition of the network by the governments of Central Asia and Mongolia;

- Initial design and further development of a website for the network;
- Preparation of a Central Asia and Mongolia clearing house for information regarding Central Asian and Mongolian and international experience on Bioresources and Biosecurity issues, databases of governmental organisations, NGOs, civil society, universities, CBOs (community based organisations), etc.

The preliminary functions of the Secretariat are:

- To organise and promote the Network at the national, regional and international level;
- To mobilise necessary resources;
- To promote the creation of a database of relevant experts and organisations;
- To coordinate the development of a long-term strategy for the network;
- To ensure participation of governmental and non-governmental organisations, research institutions and local communities;
- To attract and co-operate with potential partners;
- To establish links with the respective international organisations and treaties.

The Secretariat shall:

- Be open and transparent and shall seek to promote the Bioresources and Biosecurity Network in Central Asia and Mongolia;
- Invite NGOs from each of the countries in the region to nominate a representative organisation to liaise between the Secretariat and the NGO community in each country.

The Provisional Secretariat shall organise and facilitate meetings to establish the governing board of the network, to endorse its formal structure, and to resolve issues related to the procedure and approval of the Charter in 2004. Following a proposal by the delegation of Turkmenistan, Kyrgyzstan was selected to host the Provisional Secretariat for two years.

2 Information for All Parties Concerned

The participants emphasised the need to enhance public awareness about the importance of:

- The Cartagena Protocol;
- The Bonn Guidelines;
- The importance of traditional knowledge for the preservation and sustainable use of biodiversity and the protection of the rights of local communities over their traditional knowledge and technologies;
- The Aarhus Convention of the UN EEC on information access, public participation in decision-making processes and access to justice on issues related to environment;
- Global taxonomic initiatives.

The participants stressed the special importance of the mass media and NGO sectors for information dissemination.

3 Facilitation of Information Exchange

Information exchange more specifically includes:

- Development of databases on biodiversity experts, organisations concerned or involved, existing collections and possible financial resources;
- Development of regional and national projects on the inventory of biodiversity in cooperation with existing projects;
- Creation and maintenance of a thematic website;
- Creation of an electronic communication network;
- Organisation of a network of experts in information management and dissemination with specific emphasis on using the existing potential of national and regional organisations in Central Asia and Mongolia.

4 Discussion and Research on Legislations

The creation of working groups of specialists, legal experts and professionals focusing on legal issues pertaining to the following topics:

- Access to genetic resources and benefit-sharing;
- Traditional knowledge and technologies;
- Biosafety;
- Intellectual property rights.

The working groups of legal experts and professionals will be requested to:

- Analyse existing legislation on the above issues and on issues related to participation of the public in decision making in this sphere;
- Prepare analysis of existing international experience on these issues;
- Investigate the need for legal protection of intellectual property.

Relevant international experience should be taken into consideration when formulating national proposals to amend legislation. Participating countries should collaborate with the Secretariat on legal issues.

5 Education

The participants indicated the need to:

- Develop national educational programmes on environmental protection including issues on biosecurity and traditional knowledge and technologies and their significance;
- Create a uniform methodological framework for conducting training of trainers in the

field of biosecurity;

- The need for help in shaping mechanisms to support transfer of traditional knowledge and technologies from generation to generation;
- The need to take into account the decisions of Ministers of Education and Ecology of Central Asian countries adopted 24–25 April 2003 in Bishkek at the Second Sub-Regional Consulting Meeting “Ecological Education for Sustaining Development in CA” regarding collaboration of Ministries of Education and Ecology, scientific and public organisations of CA, and of the declaration for joint realisation of Sub-Regional Projects on Ecological Education, taken by CA countries during the European Conference of Ministers of Environmental Protection (Kiev, 20–22 May 2003).

The participants indicated the need for broad participation of interested parties in the countries that are members of the network, including governmental agencies, NGOs, research institutions, local communities, and the importance of developing close ties with international, regional, national organisations to enhance network development.

The participants of the workshop invited the State Forestry Service of the Kyrgyz Republic to act as the Interim Secretariat of the network on bioresources and biosecurity in Central Asia and Mongolia for a period of two years and proposed that Melis Sadyraliev be appointed its Secretary. The participants agreed on the need to establish a provisional Advisory Council to support the Interim Secretariat to promote and assist the development of the Network, and agreed that this advisory body should include representatives from government, research and non-governmental organisations.

The participants welcomed the offer by the Biology Institute of the Mongolian Academy of Sciences to accept responsibility for the overall functioning of and regular update of content to the website of the Network in close co-operation with the Secretariat and UNU-IAS. The participants further welcomed the offer by the Institute of Genetics and Plant Experimental Biology of the Uzbek Academy of Sciences to hold the Biosecurity III workshop in Uzbekistan in 2004. It was agreed that Biosecurity III should focus on building capacity in law and policy development related to ABS and information dissemination and public participation.

The participants thanked UNU-IAS for its support and extended their request to UNU-IAS to continue to provide technical assistance and to promote development of the Bioresources and Biosecurity Network in Central Asia and Mongolia as well as to continue to build regional and international capacity in the matters of access to genetic resources, technology transfer and benefit-sharing.

Annex II: Relevant International Commitments

Note: Extracts have been selected to illustrate the progression from the 1992 adoption of the Convention on Biological Diversity to the agreement at the World Summit on Sustainable Development in 2002 to an international regime to promote and safeguard the fair and equitable sharing of benefits arising out of the utilisation of genetic resources. These extracts are not intended as a complete summary of the relevant provisions relating to ABS.

United Nations Convention on Biological Diversity (CBD)

Article 6

Each Contracting Party shall, in accordance with its particular conditions and capabilities:

- (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in this Convention relevant to the Contracting Party concerned; and
- (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

Article 8

Each Contracting Party shall, as far as possible and as appropriate:

- (j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;

Article 15

Access to Genetic Resources:

1. Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.
2. Each Contracting Party shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose

restrictions that run counter to the objectives of this Convention.

4. Access, where granted, shall be on mutually agreed terms and subject to the provisions of this Article.
5. Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.
6. Each Contracting Party shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible in, such Contracting Parties.
7. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, ... with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms.

Article 19

Handling of Biotechnology and Distribution of its Benefits:

2. Each Contracting Party shall take all practicable measures 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.
3. The Parties shall consider the need for and modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity.

Decision VI/24 to the CBD

Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization:

Objectives 11. The objectives of the Guidelines are the following:

- (a) To contribute to the conservation and sustainable use of biological diversity;
- (b) To provide Parties and stakeholders with a transparent framework to facilitate access to genetic resources and ensure fair and equitable sharing of benefits;

- (c) To provide guidance to Parties in the development of access and benefit-sharing regimes;
 - (d) To inform the practices and approaches of stakeholders (users and providers) in access and benefit-sharing arrangements;
 - (e) To provide capacity-building to guarantee the effective negotiation and implementation of access and benefit-sharing arrangements, especially to developing countries, in particular least developed countries and small island developing States among them;
 - (f) To promote awareness on implementation of relevant provisions of the Convention on Biological Diversity;
 - (g) To promote the adequate and effective transfer of appropriate technology to providing Parties, especially developing countries, in particular least developed countries and small island developing States among them, stakeholders and indigenous and local communities;
 - (h) To promote the provision of necessary financial resources to providing countries that are developing countries, in particular least developed countries and small island developing States among them, or countries with economies in transition with a view to contributing to the achievement of the objectives mentioned above;
 - (i) To strengthen the clearing-house mechanism as a mechanism for co-operation among Parties in access and benefit-sharing;
 - (j) To contribute to the development by Parties of mechanisms and access and benefit-sharing regimes that recognize the protection of traditional knowledge, innovations and practices of indigenous and local communities, in accordance with domestic laws and relevant international instruments;
 - (k) To contribute to poverty alleviation and be supportive to the realization of human food security, health and cultural integrity, especially in developing countries, in particular least developed countries and small island developing States among them;
 - (l) Taxonomic research, as specified in the Global Taxonomy Initiative, should not be prevented, and providers should facilitate acquisition of material for systematic use and users should make available all information associated with the specimens thus obtained.
12. The Guidelines are intended to assist Parties in developing an overall access and benefit-sharing strategy, which may be part of their national biodiversity strategy and action plan, and in identifying the steps involved in the process of obtaining access to genetic resources and sharing benefits.

International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

Part IV The Multilateral System of Access and Benefit-Sharing

Article 10

Multilateral System of Access and Benefit-Sharing:

- 10.2 In the exercise of their sovereign rights, the Contracting Parties agree to establish a multilateral system, which is efficient, effective, and transparent both to facilitate access to plant genetic resources for food and agriculture, and to share, in a fair and equitable way, the benefits arising from the utilization of these resources, on a complementary and mutually reinforcing basis.

World Summit on Sustainable Development Plan of Implementation:

42. Biodiversity, which plays a critical role in overall sustainable development and poverty eradication, is essential to our planet, human well-being and to the livelihood and cultural integrity of people. However, biodiversity is currently being lost at unprecedented rates due to human activities; this trend can only be reversed if the local people benefit from the conservation and sustainable use of biological diversity, in particular in countries of origin of genetic resources, in accordance with Article 15 of the Convention on Biological Diversity. The Convention is the key instrument for the conservation and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from use of genetic resources. A more efficient and coherent implementation of the three objectives of the Convention and the achievement by 2010 of a significant reduction in the current rate of loss of biological diversity will require the provision of new and additional financial and technical resources to developing countries, and includes actions at all levels to:
- (o) Negotiate within the framework of the Convention on Biological Diversity, bearing in mind the Bonn Guidelines, an international regime to promote and safeguard the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

Endnotes

- 1 See United Nations Millennium Development Goals <<http://www.un.org/millenniumgoals/>>.
- 2 Central Intelligence Agency, *World Fact Book*, 2003.
- 3 N Safarov, V Novikov, "State of Biodiversity Report 2000", submitted to UNEP GRID Arendal, 2002, see <<http://www.grida.no/enrin/biodiv/biodiv/national/tadjik/index.htm>>.
- 4 G A Desyatkov, V M Lelevkin, V Y Ogurtsov, "Biodiversity of Kyrgyz Republic", submitted to UNEP GRID Arendal, 2002, see <<http://www.grida.no/enrin/biodiv/biodiv/national/kyrgyz/index.htm>>.
- 5 World Bank, *World Development Report 2003*, Tables 1 & 2.
- 6 The International Plant Genetic Resources Initiative (IPGRI) together with all Central Asian countries are implementing a UNEP-GEF project. "Global Environment Facility (GEF) Proposal: *In Situ*/On-farm Conservation of Agrobiodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia", see <<http://www.ipgri.cgiar.org/system/page.asp?frame=regions/cwana/home.htm>>.
- 7 P Rekacewicz, "The Shrinking of the Aral Sea: Socio-Economic Impacts", UNEP/GRID-Arendal, 2002, see <<http://www.unep.org/vitalwater/24.htm>>.
- 8 N Safarov, CBD Focal Point Tajikistan, presentation made at the workshop "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia", Issyk-Kul, Kyrgyz Republic, 10-13 August 2003.
- 9 S Schmidt, GTZ, "Nature Conservation and Bufferzone Development: Collaborative Management of Gobi Gurvan Saikhan National Park", presentation made at the workshop "In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia", 30 June - 3 July 2002, Mongolia. N Safarov, CBD Focal Point Tajikistan, "Tajikistan", presentation at the workshop "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia", Issyk-Kul, Kyrgyz Republic, 10-13 August 2003.
- 10 B Tsetsek, "Difficulties and Challenges in Implementing the Bonn Guidelines on Access to Genetic resources and Benefit Sharing in Mongolia", presented at the workshop: "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia", Issyk-Kul, Kyrgyz Republic, 10-13 August 2003.
- 11 World Bank, "Central Asian Transboundary Biodiversity Project", submitted in 1998, see <http://www.gefweb.org/Outreach/outreach-Publications/Project_factsheet/Europe-CA-cent-1-bd-wb-eng-ld.pdf>.
- 12 As of 10 Nov 2003.
- 13 See <<http://www.biodiv.org/world/parties.asp?tab=0>>, 10 Nov 2003.
- 14 See <http://www.wto.org/english/thewto_e/acc_e/acc_e.htm>, 10 Nov 2003 and <http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm>, 10 Nov 2003.
- 15 See <<http://www.fao.org/Legal/TREATIES/0335-e.htm>>, 10 Nov 2003.
- 16 See <<http://www.upov.int/en/about/members/index.htm>>, 10 Nov 2003.
- 17 See <http://www.ramsar.org/key_cp_e.htm>, 10 Nov 2003.
- 18 See <<http://www.unccd.int/convention/ratif/doeif.php?sortby=name>>, 10 Nov 2003.
- 19 See <http://www.wipo.org/about-wipo/en/members/member_states.html>, 10 Nov 2003.
- 20 Convention on Access to Information and Access to Justice in Environmental Matters, established 25 June 1998; see <<http://www.unec.org/env/pp/ctreaty.htm>>, 14 Nov 03.
- 21 See Convention on Biological Diversity, Article 15.
- 22 Ibid, Article 16.
- 23 See CBD decision VI/24 <<http://www.biodiv.org>>.
- 24 Resolution adopted by the Summit at the 17th Plenary Meeting, (A/CONF.199/20), Article 11.
- 25 WSSD Plan of Implementation adopted by the Summit at the 17th Plenary Meeting (A/CONF.199/20), Chapter IV, paragraph 44.
- 26 Ibid, paragraph 44 (o).
- 27 (A/CONF.199/20) Resolution, Article 12.
- 28 (A/CONF.199/20), Plan of Implementation, Chapter IV, paragraph 44 (q).
- 29 See <<http://www.icgeb.trieste.it/>>.
- 30 See <<http://www.icgeb.trieste.it/GENERAL/MEMBERS/memberst.htm>>, 16 Dec 2003.
- 31 Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Article 1.
- 32 N Mohamed, Regional Coordinator (Asia-Pacific), UNEP-GEF Project on Development of NBF, "Development of National Biosafety Frameworks", presented at the workshop "Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia", Issyk-Kul, Kyrgyz Republic, 10-13 August 2003.
- 33 See: Annex 1C to the Marrakech Agreement establishing the WTO in 1994.
- 34 IP/C/W/383, IP/C/W/400, IP/C/W/403, and IP/C/W/404. See <http://www.wto.org/english/tratop_e/trips_e/art27_3b_background_e.htm>.
- 35 Biosecurity I was supported by UNU-IAS and UNESCO/MAB, Biosecurity II was supported by UNU-IAS and UNEP-GEF.
- 36 This section is primarily based on the findings derived from a country report on Kazakhstan written by G Kamalova and T Kerteshev, CBD Focal Point of Kazakhstan, which was submitted to the workshop: "In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia", 30 June to 3 July 2002, Mongolia and has been revised respectively by the CBD Focal Point since then.
- 37 Pers. comm. Y Zhumabayev, CBD Focal Point of the Republic of Kazakhstan, Nov 2003.
- 38 Ibid.
- 39 See *Country Progress Report for Kazakhstan within the UNEP-GEF project on Development of National Biosafety Frameworks (NBF)*, prepared for the UNEP-GEF Biosafety Sub-Regional Workshop for Central and Eastern Europe on the Development of Regulatory Regime and Administrative Systems in NBFs, Antalya, Turkey, 9-12 Dec 2003.
- 40 Ibid. The laws include: "About Environmental Protection" (1997), Ministry of Environment; "About Health Protection" (1997), Ministry of Health; "About Plant Protection" (2002), Ministry of Agriculture.
- 41 This section is primarily based on the findings derived from a country report of Kyrgyzstan written by M Sadyraliev and J Kojogulov (Dept. of State Control of Use & Protection of Flora & Fauna, State Forestry Service of Kyrgyzstan), CBD Focal Point of Kyrgyzstan, which was submitted to the workshop "In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia", 30 June to 3 July 2002, Mongolia and has been revised since then.
- 42 See Milieu Kontakt Oosteuropa <<http://www.milieukontakt.nl>>. Milieu Kontakt Oosteuropa is a Dutch Donor Organization active in Central and Eastern Europe and Central Asia.
- 43 The Kyrgyz Republic has adopted more than ten laws and seventy sub-legislative acts relating to environmental regulation. See G A Desyatkov, V M Lelevkin, V Y Ogurtsov, "Biodiversity of Kyrgyz Republic", submitted to UNEP GRID Arendal, 2002, see <<http://www.grida.no/enrin/biodiv/biodiv/national/kyrgyz/index.htm>> <<http://www.grida.no/enrin/biodiv/national/Kyrgyz/bioresp.htm>>.

- 44** See *Country Progress Report for Kyrgyzstan within the UNEP-GEF project on Development of National Biosafety Frameworks (NBF)*, prepared for the UNEP-GEF Biosafety Sub-Regional Workshop for Central and Eastern Europe on the Development of Regulatory Regime and Administrative Systems in NBFs, Antalya, Turkey, 9–12 Dec 2003.
- 45** Ibid.
- 46** This section is primarily based on the findings derived from a country report of Mongolia written by N Oyundari, CBD Focal Point of Mongolia, which was submitted to the workshop “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, 30 June to 3 July 2002, Mongolia and has been revised since then.
- 47** B Tsetsek, “Mongolian Traditional Milk Products”, presentation given at the workshop “Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia”, Issyk-Kul, Kyrgyz Republic, 10–13 August 2003.
- 48** See *Country Progress Report for Mongolia within the UNEP-GEF project on Development of National Biosafety Frameworks (NBF)*, prepared for the UNEP-GEF Biosafety Sub-Regional Workshop for Central and Eastern Europe on the Development of Regulatory Regime and Administrative Systems in NBFs, Antalya, Turkey, 9–12 Dec 2003.
- 49** Ibid, p. 3.
- 50** B Tsetsek, “Difficulties and Challenges in Implementing the Bonn Guidelines on Access to Genetic Resources and Benefit-Sharing in Mongolia”, presented at the workshop “Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia”, Issyk-Kul, Kyrgyz Republic, 10–13 August 2003.
- 51** This section is primarily based on the findings derived from a country report of Tajikistan written by N. Safarov, CBD Focal Point of Tajikistan and head of the National Working Group for Biodiversity, which was submitted to the workshop “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, 30 June to 3 July 2002, Mongolia and has been revised since then.
- 52** G Erdenejav, “Traditional Methods of Protection and Use of Local Flora and Pastures by the Nomadic Population of Central Asia”, presented at the workshop “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, 30 June to 3 July 2002, Mongolia.
- 53** N Safarov, V Novikov, “State of Biodiversity Report 2000”, submitted to UNEP GRID Arendal, 2002, see <<http://www.grida.no/enrin/biodiv/biodiv/national/tadjik/index.htm>>.
- 54** Pers. comm. N Safarov, national CBD Focal Point of Tajikistan.
- 55** This section is primarily based on the findings derived from a country report of Turkmenistan written by S Karryeva, CBD Focalpoint of Mongolia, and P Kelyayev, and which was submitted to the workshop: “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, 30 June to 3 July 2002, Mongolia and has been revised since then.
- 56** The Ministry of Nature Protection of Turkmenistan, “National Report on the State of Natural Environment”, Ashgabat 1999, submitted to UNEP GRID Arendal, see <<http://www.grida.no/enrin>>.
- 57** P. Keldjayev, “Local Experience in Preservation of Traditional Knowledge: Yesterday, Today and Tomorrow”, National Institute of Deserts, Flora and Fauna, presentation given at the workshop “Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia”, Issyk-Kul, Kyrgyz Republic, 10–13 August 2003.
- 58** This section is primarily based on the findings derived from a country report of Uzbekistan written by E Chernogaev, State Committee of Nature Protection, and Y Salieva, and which was submitted to the workshop “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, 30 June to 3 July 2002, Mongolia and has been revised since then.
- 59** See <http://www.vir.nw.ru/history/vir_act.htm>.
- 60** “CGIAR is an association of public and private members supporting a system of sixteen Future Harvest Centres that work in more than 100 countries to mobilise cutting-edge science to reduce hunger and poverty, improve human nutrition and health, and protect the environment”. See <<http://www.cgiar.org/who/index.html>>, 03 Dec 2003.
- 61** J Voswinkel, “Samen Sammeln in Ruinen: Das Wawilow-Institut in Sankt Petersburg ist in höchster Gefahr. Mit grenzenlosem Einsatz kämpfen russische Botaniker um eine der größten Genbanken der Welt”, in *DIE ZEIT*, 35/2003.
- 62** For further information, see the Vavilov Centre’s website <<http://www.vir.nm.ru/info.htm>>.
- 63** See note 61.
- 64** A mid-level government employee in the Kyrgyz Republic earns US\$80 per month; an entry-level researcher in Mongolia earns \$US50 per month; and a comparable researcher in Uzbekistan earns only US\$30 a month. Pers. comm. with workshop participants during Biosecurity I and II.
- 65** Keynote speech of Mr. M. Kuchukov, Deputy Minister of the Kyrgyz State Forestry Service, at the workshop “Biosecurity II: Access to Genetic Resources and Benefit-Sharing, Traditional Knowledge and Biosafety in Central Asia and Mongolia”, 10 Aug 2003, Kyrgyz Republic.
- 66** Pers. comm. with CBD Focal Points of the Republic of Kazakhstan, the Kyrgyz Republic, Turkmenistan and Uzbekistan, November 2003.
- 67** UNEP-GEF projects on National Biosafety Frameworks, *Questionnaire on resources and expertise available in countries for the exchange of information with the Biosafety Clearing House of the Cartagena Protocol*, July 2003.

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UNU Leadership Academy (UNU/LA), Amman, Jordan

Focus: leadership development

Email un2@ju.edu.jo, URL <http://www.unu.edu/la>

UNU International Network on Water, Environment and Health (UNU/INWEH), Hamilton, Canada

Focus: water, environment and human health

Email contact@inweh.unu.edu, URL <http://www.inweh.unu.edu>

UNU Programme for Comparative Regional Integration Studies, Bruges, Belgium

Focus: local/global governance and regional integration

Email info@cris.unu.edu, URL <http://www.cris.unu.edu>

UNU Food and Nutrition Programme for Human and Social Development, Cornell University, USA

Focus: food and nutrition capacity building

Email Cg3o@cornell.edu, URL http://www.unu.edu/capacitybuilding/Pg_foodnut/cornell.html

UNU Geothermal Training Programme (UNU/GTP), Reykjavík, Iceland

Focus: geothermal research, exploration and development

Email os@os.is, URL <http://www.os.is/unugtp/>

UNU Fisheries Training Programme (UNU/FTP), Reykjavík, Iceland

Focus: postgraduate fisheries research and development

Email tumi@hafro.is, URL <http://www.unu.edu/iceland/fisheries/fisheries.html>

Centre for International Conflict Research (INCORE), Londonderry, United Kingdom

Focus: ethnic, political and religious conflicts

Email incore@incore.ulst.ac.uk, URL <http://www.incore.ulst.ac.uk>