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In Search of Biosecurity

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 the workshop “In Search of Biosecurity: Capacity Building on Access to Genetic Resources, Benefit Sharing and Biosafety in Central Asia and Mongolia”, held from 30 June to 3 July 2002 in Ulaanbaatar, Mongolia.

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Foreword

The countries of Central Asia and Mongolia have undergone substantial transitions in the past fifteen years. They are among the poorest in the world, living on less than \$2 a day. Yet these countries are the repository of rich biodiversity and scientific knowledge. They share a history as centres of origin for many domesticated plant and animal species and are an important source of genetic material. While exhibiting a diversity of national conditions they share in varying proportions a common geography that consists largely of mountains and desert.

Despite their importance as centres of crop diversity and the provision in the Convention on Biological Diversity (CBD) (Article 20) 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, very little international attention has been given to providing support for the conservation and sustainable use of the biological diversity of the region.

Concern at this lack of attention led the UNU Institute of Advanced Studies, together with UNESCO and the Ministry of Nature and Environment of Mongolia, the Mongolian Academy of Sciences and the Embassy of Mongolia to Japan, to convene a workshop in Ulaanbaatar from 30 June to 3 July 2002, entitled "In Search of Biosecurity: Access and Benefit-Sharing and Biosafety in Central Asia and Mongolia". The workshop focussed on issues of access and benefit-sharing (ABS), traditional knowledge, and biosafety, currently amongst the most important biodiversity issues under debate

The purpose of the workshop was to undertake an assessment of regional capacity development needs for the development of appropriate domestic regulatory and policy frameworks. The workshop was also intended to raise stakeholder awareness of global, regional, and national activities in these areas; offer a forum for the exchange of information on best practices; and develop a basis for co-operative action within the region in accordance with assessed needs.

This report draws on presentations made by international and national experts during the workshop, on the discussions and findings of the workshop and on country reports presented and prepared by government representatives from Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan, nominated by their respective CBD focal points. A synopsis of each country report to be included in the workshop report has been circulated to the respective country experts and further input has been received. The report, however, does not take account of recent

international developments, such as the World Summit on Sustainable Development (WSSD).

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, preparations are underway for a follow up workshop in Kyrgyzstan on capacity development needs, where this report will serve as a background document, and hope that our involvement in the region can increase.

A H Zakri
Director, UNU/IAS

Executive Summary

Access to genetic resources and benefit-sharing, the recognition and protection of rights over traditional knowledge, and biosafety are currently amongst the most important biodiversity issues under debate.

This report, “In Search of Biosecurity: Capacity Development on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia” seeks to provide an overview of the manner in which the countries of the region are responding to the challenge of developing laws and policies to address issues in these areas.

The report includes a regional and national overview of the state of biodiversity, its importance to sustainable development and the principal pressures on genetic and biological resources in the region, namely fragile arid and semi-arid ecosystems, limited resources and economic development, and the international context and multilateral instruments relevant to these issues. This report also highlights the respective policy and regulatory frameworks, including those relating to ABS and biosafety and the role that traditional knowledge has played, and continues to play, in the biodiversity management in the region.

This report is based primarily on, and illustrates, the proceedings and findings of a workshop “In Search of Biosecurity: Capacity Development on Access to Genetic Resources, Benefit-Sharing, and Biosafety in Central Asia and Mongolia”, which was held by UNU/IAS in co-operation with other organizations from 30 June 2002 to 3 July 2002 in Ulaanbaatar, Mongolia. The participants of this workshop, representing their national CBD focal points or Ministries, compiled and presented country reports. This report is also a synopsis of these country reports.

In outlining the existing domestic programmes and legislation in the different countries, the report takes note of priorities for action as identified by the different countries and examines capacity development needs. The report notes that all countries of the region cite financial constraints as impeding their ability to build capacity, particularly with respect to conservation and the further development of data systems and information management. Other common themes include the challenge of integrating biodiversity considerations across all sectors and the importance of increasing public awareness of these issues. Reference is also made to the need to strengthen the policy and regulatory framework with respect to ABS, traditional knowledge, and biosafety.

In response to these challenges, the participants of the workshop decided to create a “Central Asian and Mongolian Biosafety and Bioresources Network”. It is intended that the Network will provide a forum for the exchange and pooling of scientific, technical,

and policy information, including best practices; and facilitate implementation of the CBD, especially in the area of ABS. It will also serve as a platform on which common research activities can be realized. The Network will have the potential to facilitate training on biosafety and associated risk management issues and to strengthen capacity for effective participation in the ongoing international policy dialogue.

A second workshop is to be held in July 2003 in Kazakhstan where capacity development needs will be further elaborated and prioritized. This workshop will offer an opportunity to exchange and detail experiences with reference to policy and regulatory issues associated with ABS, traditional knowledge, and biosafety; consider means of implementation and examine the challenges posed by the negotiation of an international regime on ABS, as called for at WSSD.

1 Introduction

1.1 Regional Context

The countries of Central Asia, 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 originated in Central Asia and the region continues to be an important source of genetic resources and information. The countries in the region are also repositories of traditional knowledge with, of course, variations amongst them as to the areas of traditional knowledge in which they have specialized over the centuries. Many, for example, are the holders of traditional knowledge in the field of medicine while Mongolia is the repository of traditional knowledge on pasture management in particular, reflecting its traditional nomadic lifestyle. Regardless of differences in areas of specialization and resource endowment, all the countries of the region are facing environmental and economic pressures.

The region is amongst the most environmentally vulnerable with its ecosystems threatened by land degradation, desertification, deforestation, and soil, water, and air pollution. The causes of land degradation in Mongolia can be attributed to both natural and anthropogenic causes. 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, vehicles are major contributors to land degradation.

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 and irreversible globalization and the attendant exposure to external influences and pressures, has resulted in poverty and unemployment for some sectors of the population. This has led to increasing demand for biological and genetic resources from not only domestic users but also from outside the region. A first step in ensuring that these demands translate into benefits for the custodians of these resources is to establish mechanisms to facilitate access and capture of economic rents for use of these resources, otherwise there may be no or only limited benefits to be shared amongst stakeholders.

Thus, there is a clear imperative to develop a strategy that simultaneously addresses both access

and benefit-sharing. In this time of accelerating change, it is also increasingly urgent to recognize 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 World Summit on Sustainable Development (WSSD) held in South Africa 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 and encouraging 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 conserving and the sustainable use of biodiversity. It also specifically addresses the questions of ABS. 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 benefits arising out to the utilization of genetic resources.

Equally, there is an imperative to develop biosafety regimes in the region given the environmental vulnerability of the respective ecosystems. The fact that yet none of the countries has significant biotechnology sectors 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 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. This is not to deny the possibility of specific and targeted actions but simply to acknowledge the size of the task ahead and the need to take a realistic approach to maximize the effectiveness of available resources, both domestic and international.

One of the challenges is that, whether the countries of the region are considered to belong to the European or Asian regional grouping of a specific intergovernmental organization, in neither case have their issues and agenda been central to that of

the regional group as a whole. For instance, all but Mongolia belong to the Regional Office of Europe of the United Nations Environment Programme (UNEP) and the focus of that Office has tended to reflect the interests of industrialized economies. Mongolia belongs to the Asia Pacific region where again attention has focussed more on environmental issues the more tropical and southern ecosystems.

1.2 Multilateral Instruments

A number of international organizations 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 Cartagena Protocol, the World Trade Organization (WTO), World Intellectual Property Organization (WIPO), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), membership in which brings with it certain rights and obligations. Despite the absence of universal membership in or acceptance of such international agreements and instruments by countries in the region 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.

1.2.1 Convention on Biological Diversity (CBD)

The countries of the region have all adopted conservation and sustainable development as guiding principles and, consistent with this approach, are members of the Asian Regional Group of the CBD, a product of the 1992 United Nations Conference on Environment and Development (UNCED). 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 as set out in Articles 6 and 8 of the Convention that 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 strategies and action plans for the conservation and sustainable use of biological resources. All note the involvement in this process of a wide range of interested parties, both government and non-government. The status of these national strategies and plans in terms of approval and implementation varies somewhat between the countries. However, a common difficulty is that of financial constraints. This is particularly problematic with respect to the maintenance or, in some cases, the development of databases of biological resources and

in managing or extending protected areas. In varying degrees, all countries of the region cite a loss of, or limited, institutional capacity that in several cases is said to add to the challenge of maintaining, let alone enhancing, existing databases of genetic resources.

ABS is an issue of particular relevance to the domestic or transboundary transfer of genetic resources, the importance of which is recognized by the CBD-approved GEF funded Capacity Development Initiative designed to help assess a country's capacity development needs in this area. Recognizing 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. ABS has 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".

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

Another 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 the use of ITPGRFA. The provisions of the Treaty apply only to the genera and species listed in Annex I to the Treaty, but these genera and species, many of which are of importance to the countries of the region, provide more than ninety 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 also sets out mechanisms for the fair and equitable sharing of the benefits accruing from the facilitated access; seeks to balance the rights of various groups involved, including farmer's rights; and is supportive of 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, adopted by Parties to the CBD in April 2002.

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 related modality for technology transfer is the International Centre for Genetic Engineering and Biotechnology (ICGEB), a UN affiliated organization 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 ICGEB, although Tajikistan has indicated its intention to become a member.

1.2.3 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 criticized 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.

1.2.4 Cartagena Protocol to the CBD

Another relevant and very topical issue is the relationship between transboundary transfers of genetic resources and biosafety. Recognizing the need to address this relationship, 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 focussing on transboundary movements (Article 1).

The countries of the region express interest in biotechnology and its potential to encourage sustainable development by allowing them to 'leapfrog' to advanced technology. All, however, express concern and cite the lack of adequate scientific and insufficient human resources to be able 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 \$38.4 million UNEP-GEF Project on the Development of National Biosafety Frameworks that aims to assist countries to prepare for entry into force of the Cartagena Protocol through the establishment of National Biosafety Frameworks. 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 organizations to assist capacity development and optimize partnerships.

Kazakhstan, the Kyrgyz Republic, and Tajikistan 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. Turkmenistan has indicated that formal endorsement will be forthcoming shortly and Mongolia is preparing to sign the Protocol.

1.2.5 Traditional Knowledge in the International Context

The importance of traditional knowledge for the conservation and sustainable use of biological diversity is widely recognized, 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.

There has been a tendency for States in implementing the CBD's provision of ABS and Article 8 (j) to require the prior informed consent of communities as a pre-condition for the collection and use of 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, On the other hand much indigenous knowledge is collectively developed over long periods of time; shared orally; tends to be undocumented; is often taken for granted and 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 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 IP review procedures to protect against the granting of IP rights 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 being parties to the 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 in the region. That said, 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)).

1.2.6 World Trade Organization (WTO)

Amongst the countries of the region only Mongolia and Kyrgystan are members of the WTO. 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 summarized 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 prioritizes economic considerations such as minimizing 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 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 for developing countries, also gives longer periods for implementation for developing and least developed countries of five and eleven years.

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..." Article 27.3 (b) provides for an exclusion of patentability of plants and animals other than micro-organisms, but members shall 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 for the relation of traditional knowledge and IPR.

2 The Workshop

2.1 Rational for the Workshop

It was to redress the lack of international attention to the circumstances and needs of the countries of Central Asia and Mongolia and in recognition of the need for action, that UNU/IAS, together with UNESCO and 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 2002. The workshop, entitled “In Search of Biosecurity: Access and Benefit-Sharing and Biosafety in Central Asia and Mongolia” provided an opportunity for experts from the region and international organizations to consider how best to address the issues of access to biological resources within the region and the sharing of the benefits thereof, as well as the role that traditional knowledge and biosafety play in advancing sustainable development.

Recent developments have given added impetus to the need to address these issues. These events include the adoption of the Cartagena Protocol on Biosafety (2000), the ITPGRFA (2001), and the Doha Declaration, which, in launching the next round of negotiations under the WTO in 2001, addresses the interface of trade, sustainable development and environment, with a view to enhancing the mutual supportiveness. The global debate on these issues is engaged and it is important to participate. To do so effectively, however, requires an understanding of what are complex issues and of their interrelationship, hence the immediacy and importance of the UNU/IAS workshop.

2.2 Proceedings of the Workshop

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

To this end, participants heard presentations on access to genetic resources and benefit-sharing in the context of the CBD and the ITPGRFA, and on the conservation of bioresources in arid and semi-arid regions and on desertification. Participants expressed the view that it would be problematic to conserve indigenous and traditional knowledge under existing international legislation. These were followed by case studies of the traditional medicine in China and the conservation of traditional knowledge in Mongolia.

Following an introductory session on biosafety and a presentation on inter-linkages between the Cartagena Protocol of the CBD and other international instruments and the challenges and opportunities that they offered, discussion turned to possible frameworks for national strategies on genetic resources, with presentations, *inter alia*, on regional case studies and the regional perspective. 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. This was followed by a presentation of country status reports on biological diversity and perspectives on ABS, traditional knowledge, and biosafety.

2.3 Conclusion of the Workshop

The workshop concluded with a panel discussion on next steps, including proposals for the creation of a Central Asia and Mongolian network addressing biosecurity and related development issues; a case study on traditional knowledge and the role it plays in the protection and sustainable use of genetic resources; the creation on a case study basis of a data base of traditional knowledge; 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 Central Asia and Mongolia share many commonalities and some differences in their capacity development needs. The region has rich biological resources and a long-standing and abiding affinity with land and nature, with genetic resources and traditional knowledge and traditional ways having a value that cannot be fully captured in commercial terms. Another session was devoted to the development of national policies on ABS with presentations on the Bonn Guidelines [of the CBD] on Access to Genetic Resources and Equitable Sharing of the Benefits arising from their Utilization; on the role and importance of prior informed consent as an essential tool for access to such resources; and on the relationship between intellectual property rights and traditional knowledge. They share Russian as a common language and their shared history and cultural similarities offer opportunities for collaboration in advancing the conservation of biological resources in particular and sustainable development in general.

Most cited is a lack of legal and institutional capacity and yet to establish laws addressing ABS and biosafety. Some of the collections of the regions’ genetic resources are held in institutions of the former Soviet Union with attendant affect on biotechnology in the region and science holds little

attraction for young people. This is compounded by the lack of resources and English language skills to take advantage of information technology. 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. A lack of institutional capacity to develop the necessary frameworks was cited as an obstacle, as was the lack of adequate resources for implementation. 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 An ABS Strategy: Key Considerations and Strategic Issues

The reasons for developing an ABS strategy are many, including the fulfilment of obligations under the CBD, which urges members to include in their national legislation and biodiversity strategies measures for the equitable sharing of benefits arising out of the use of genetic resources and the attempt to maximize the contribution of genetic resources to sustainable development.

The issues are complex and all countries face challenges in developing an ABS strategy. Uncertainties with respect to the future and to other actors; an incomplete understanding of the interrelationships; and the unawareness of the importance of integrating biodiversity considerations into national development policies and frameworks add to the difficulty of the task.

An ABS strategy must match demand for access with conservation needs and benefit-sharing. Its implementation requires the participation of institutions with the capacity, resources, and motivation to take action. Thus, the appropriate policy framework has the potential not only to foster conservation of biological resources and mainstreaming biodiversity considerations, but also to contribute positively to livelihoods; to stimulate the bioindustry; and to build human, institutional, and scientific capacity.

Key strategic issues are to determine the awareness and engagement of stakeholders and the extent to which the existing legal and policy framework can be built on. It is also essential to determine what policies and initiatives in other sectors should be involved and to identify the challenges that can be expected in implementing an ABS strategy and any associated legislation.

Adequate information is a first step in ensuring that the ABS strategy that is developed will enhance conservation and sustainable use and equitable utilization. The body established to coordinate the development process of an ABS strategy plays a critical role. Starting on a modest scale is better than no strategy at all and decisions will thus be required on the scale of the undertaking. It is important to integrate an ABS strategy with a wide range of existing law and policy, but a general tendency is to create specific legal frameworks for biodiversity. The process must also address the issue of participation and co-operation to ensure level of commitment and engagement necessary for successful implementation.

Other factors relevant to the development of an ABS strategy include an understanding and knowledge of the genetic resources and associated information, and of the existing legal and policy framework and the capacities and needs of domestic and foreign

stakeholders. This provides the basis on which to create a shared vision and from which the core strategy for success and its elements can be developed.

An ABS strategy is broad ranging and addresses a wide range of issues like equitableness in the interrelation between state, private sector, and citizens of a country including local communities and indigenous peoples, as well as the protection and use of traditional knowledge. There is a focus on science and technology and on institutional and human capacity. In short, an ABS strategy addresses the environmental, social, and economic issues and, as such, can play a role in advancing sustainable development.

Key Considerations for the Development of an ABS Strategy

Based on a presentation of Kerry ten Kate

Why Prepare an ABS Strategy?

- Optimize contribution of biodiversity to conservation and sustainable development
- Cope with complexity and uncertainty
- Learn from experience
- Mainstream environmental considerations in policy-making

What are the Key Strategic Issues and Considerations?

- Awareness and engagement of domestic stakeholders
- How to build on existing legal and policy framework
- What existing policies and initiatives in other sectors should be involved and how this can help mainstream biodiversity
- What key access-related capacities do you wish to build
- To what extent are livelihoods based on the use of genetic resources
- Can genetic resources contribute to international trade and direct investment
- What are the factors affecting your country's competitiveness as a supplier of genetic resources

A Planning Cycle for an ABS Strategy

- Getting started:
 - Establishing a body to coordinate, deciding on scale, mainstreaming, managing participation
- Assessment:
 - Genetic resources, legal and policy framework, capacities and capacity needs of domestic and foreign stakeholders
- Strategy formulation:
 - "Shared vision", identifying core strategy and its elements
- Implementation and feedback

Key Stakeholders

- Ministries and government officials
- Foreign and domestic industry
- Foreign and domestic scientific institutions

4 Country Reports

Although geographically unified, the countries of the region exhibit a range of ecosystems and topography from the mostly mountainous Tajikistan and Kyrgyz Republic to the increasingly desertified Uzbekistan, from the diversified terrain and ecosystems of Turkmenistan and Kazakhstan to the grasslands of Mongolia. Nonetheless, all share the need to reinforce or develop their legal and policy frameworks with respect to genetic resources and, despite differences in their respective genetic resources, 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 globalization brings.

Political support is the *sine qua non* for developing and implementing a legal and policy framework for ABS and for biosafety. 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 maintaining existing databases of genetic resources 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).

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. However, there is not room in a report of this nature to provide detail on all these areas.

The following summary, based on country reports from the countries of the region, therefore 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. Kazakhstan

4.1.1. Biological Resources and Environmental Challenges

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, some of which are of global importance.

Kazakhstan is home to 125 species of vertebrates and 96 species of invertebrates and is an important centre for migratory birds and a centre of origin for fruit cultivars. Its ability to support and maintain this biological diversity is being challenged by wind and water erosion and increasing salinization with the result, for example, that pasture is available for just 51.1 per cent of livestock. The decline in biodiversity is also attributed to a reduction in recent years in environmental controls and in funding available for research and monitoring.

4.1.2 Institutional Framework

The Ministry of Natural Resources and Environmental Protection (MNREP) is responsible for the conservation of biodiversity and for implementation of the CBD. In 1997, MNREP 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 which has been approved by MNREP in 1999 but, at the time that this report was received, had yet to be considered by the Government.

The protection, reproduction, and use of biological resources are regulated by MNREP, with the Ministry's Forestry, Fishing, and Hunting Committee having direct responsibility for the implementation of regulations. The Ministry of Education and Science is also involved in this area and with research being conducted by several other agencies and educational institutions.

4.1.3 Environmental Policies and Programmes

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. The Strategy also notes the importance of developing additional protected areas, currently accounting for 0.5 per cent of the land area; and of both *in situ* and *ex situ* conservation, including the establishment of germplasm banks. In order to complete the

biodiversity inventory and to advance the control of biodiversity conservation and use to be advanced, 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 Kazakhstan's Red Book; the compilation of the Book of the genetic fund of Kazakhstan's flora and fauna; the formation of a germplasm bank of endemic and disappearing plant species and a bank of agricultural crop germplasm will require priority attention. The institutional framework, including the legal framework, economic assessments, incentives for conservation and public awareness, and enhanced international links are also identified as critical with regard to the sustainable use of biological resources and the restoration of degraded lands.

The National Action Plan 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. Kazakhstan has developed a capacity development proposal relating to biodiversity information management that has been accepted by GEF for implementation and that will be a major contribution towards the establishment of a Clearing House Mechanism.

The principles of the conservation and sustainable use of biological resources are established in Kazakhstan's main programme documents. However, pending approval by the Government of the National Strategy and Action Plan, its realization will be difficult as many proposed actions and measures are beyond the mandate of MNREP and will require integration with other national programmes and funding from the national budget.

The National Action Plan addresses the expansion of genetic resources and biosafety as measures 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 been considered a priority in terms of Kazakhstan's National Plan and have been considered in conjunction with conservation issues. There are no legal provisions relating specifically to access to genetic resources.

There has been, however, some work on *ex situ* conservation of genetic resources through the creation and development of germ culture collections, the creation of genetic banks, animal breeding, and plant propagation, and the creation and support of collections of living organisms. Steps have been taken to identify appropriate storage conditions and to conduct research on the conservation and effective use of germ culture genetic funds, in recognition of the potential for germ resources to play a significant economic role and to contribute to quality of life. 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 centralized 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. It is therefore not possible to enhance the capacity to cultivate and re-introduce rare and threatened plant species from unrepresented zones.

4.1.4 Biosafety

Despite the increasing global interest in biotechnology, Kazakhstan has yet to place any emphasis on the issue. Responsibility for environmental safety and integrity is dispersed amongst a number of government agencies, including the Ministries of Natural Resources and Environmental Protection, Agriculture, Science and Education, State Incomes and Health.

The National Centre on Biotechnology is tasked with ensuring progress in the fields of medicine, agriculture and industry and developing methodological foundations for modern biotechnology in Kazakhstan. The various scientific research institutes carry out projects in collaboration with, and funded by, foreign research centres. Existing initiatives and research would seem to focus exclusively on the science of biotechnology, with an absence of activities addressing biosafety policy issues *per se*.

Biotechnology issues are reflected in the Government Development Plan for 2001–2005 and some funding is provided for "scientific and technical support and organization of the production of products derived from biotechnology in the Republic of Kazakhstan". In particular, the National Centre on Biotechnology is mandated to ensure biological progress in medicine, agriculture, and industry and aims to develop methodological foundations for modern biotechnology in the country. National science research institutes are engaged in biotechnology projects with foreign research centres.

4.1.5 The Challenges of Implementation

Kazakhstan faces a number of challenges in its efforts to implement its CBD commitments and cites the lack

of national coordination in terms of implementation and information and weak intersectoral co-operation; a lack of funds and of financing mechanisms; and the need to improve economic incentives and the legal framework. More specifically, Kazakhstan recognizes that these obstacles must be addressed if it is to put in place an effective framework for ABS and biosafety.

Kazakhstan has also indicated a number of steps that it must take in order to comply with its CBD obligations in general. 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 Kazakhstan's international transactions in this area. Capacity development needs have been identified in terms of Special Protected Areas; the conservation of genetic funds; and information gathering and maintenance. Kazakhstan has pointed to a general need for improved management structures and financing mechanisms for biodiversity management; for an expansion of specially protected areas and the introduction of a complex monitoring system for biodiversity and an environmental infrastructure for tourism.

In terms of implementing its NBSAP, Kazakhstan has identified as important next steps 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. Kazakhstan also acknowledges the importance of institutional frameworks and 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.

With respect to genetic resources, the legal focus has been on their conservation and Kazakhstan has yet no law on access to these resources. As in other areas of biodiversity, there is also a need for national coordination and for the development of accepted accounting, control and monitoring systems, and protected area capacity development.

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 benefits. The lack of a normative and legal framework on access to genetic resources and the absence of

a national law on the protection, reproduction, and sustainable use of flora are also cited as being of concern with respect to access to genetic resources. Regarding biosafety issues, there is an expressed need to strengthen existing capacity in terms of equipment, laboratories, databases, and information management as well as to create a centralized culture collection.

4.2 Kyrgyz Republic

4.2.1 Biological Resources and Environmental Pressures

Biodiversity conservation is intrinsically bound to the social and economic development of the Kyrgyz Republic. Biodiversity has been at the heart of the spiritual development of the nation, reflecting its origins as a nomadic society. 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 and these wild relatives of economically important species of food plants and trees constitute important genetic resources.

The Kyrgyz Republic is home to over 20,000 species or 0.8 per cent of known species, a remarkable biodiversity richness, considering Kyrgyzstan's extreme climatic and environmental conditions, with over ninety per cent of country more than 1000 metres above sea level and twenty-three per cent above 3,500 metres. The mountainous terrain means that 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.

Investment in strengthening the protection of natural resources will support sustainable use of resources for future generations and provide an important means of ensuring improved livelihoods for the people of the Kyrgyz Republic. However many ecosystems are under pressure and are critically threatened, thereby endangering the species they support. Although the status of many of the species is not known, approximately one 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 fifty 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.

There has been increased pressure on ecosystems and threats to biological diversity of the Kyrgyz Republic as economic reforms to move from a state planned to a market economy have been actively pursued. While biological resources provide a cornerstone upon which to build economic recovery, especially in the agricultural and service economies (e.g. tourism), socio-economic conditions are the cause of many of the threats to biodiversity conservation and are, at the same time, major constraints to long-term sustainability. The economic situation has led to massive habitat degradation, the overuse of biological resources, and pollution of the environment. As elsewhere in the region, financial restrictions limit Kazakhstan's ability to take remedial measures. There have also been widespread social difficulties associated with the transition process. These pressures have in turn led to an increased reliance upon natural resources, especially by the rural poor, where biodiversity provides important subsistence and income opportunities. This has resulted in pollution, massive habitat degradation and the overuse of biological resources at the same time that institutional capacity to respond been reduced; only intensifying the reliance of the rural poor on natural resources.

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. Kyrgyz Republic recognizes the imperative of having in place an appropriate framework to mitigate these pressures and to ensure the conservation and sustainable use of these resources for present and future generations.

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 ten per cent of land has completely changed

its habitat type. This change began with the mass settlement of the traditionally nomadic people in 1921, further to Soviet land reform and the loss of private property rights. Timber was felled for housing, the steppes ploughed and irrigated to create arable land, and the environment began to experience the effects of industrial production, mining, and other extractive industries, and intensified grazing of livestock.

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; forestry service; and extensive legislation designed to protect biodiversity and regulate off-take. The weakening of the effectiveness of the protected areas network is of particular concern and priority is attached to strengthening and extending this system. The existing *ex situ* centres also provide an important resource for conservation and a number of independently funded 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 in Kyrgyz Republic. 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, all areas of considerable importance for both ABS and biosafety.

Financial pressures have impacted protected areas in terms of staffing; the efficiency and effectiveness of protected areas management, and the enforcement of ecological protection; and the ability to expand areas under protection so that all ecosystems are represented and/or that the protected areas are not mere fragments of what is needed to conserve an ecosystem's biological resources.

Moreover, recent financial constraint have crippled scientific institutions and led to the abandonment of long-term research and monitoring programmes, despite the Kyrgyz Republic's long history of biological study and its strong research base relating to biodiversity. A strong base of trained and experienced personnel still exists and can be drawn on in developing conservation projects. However, biodiversity management must be grounded on good and effective data, and investment into appropriate research activities will be a necessary component of any future biodiversity conservation programmes. If realistic projects are to be developed and

implemented, it must be recognized that although good institutional capacity remains in a number of sectors involved with environmental protection (including government agencies and educational establishments), recent economic events have resulted in a significant erosion of institutional capacity. Low public awareness of biodiversity issues has meant that ecological impacts are not considered at a community level. The growing NGO movement is assuming a more active role, and it will be important for the development and implementation of future independent projects that public awareness and public involvement be increased and the role of NGOs strengthened.

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. Public awareness remains low and there is limited involvement of local communities in conservation activities and, consequently, in decision making on ecological protection.

4.2.3 The Legal Framework for Policy-Making

In principle, the existing legal base, based on Soviet nature protection legislation, covers all elements of the relationship between nature and society. Improvements to the legal system have been ongoing since 1961. In addition, Kyrgyz Republic has assumed international obligations under a number of multilateral environmental conventions and is beginning to develop a network of regional and interstate cooperative 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. Kyrgyz Republic also regulates commercial activities that impact or use agricultural, forest, fish, land, or water resources. Many of these laws have been amended and updated in response to the new economic situation.

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 Kyrgyz Republic 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 A Role for Financial Mechanisms

There is an increasing need to develop financing mechanisms to address the sizable reduction in state support in real terms during the process of economic transition, the impact of which has been noted above. There is also a need for financing mechanisms to respond to the environmental impact of increasing economic activities and improve biodiversity conservation and environmental issues 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.

4.3 Mongolia

4.3.1 Biological Resources and Environmental Pressures

Mongolia is a country of extreme environments with a rich biodiversity and a high endemism of genetic resources, particularly those resources found in mountain, grassland, semi-arid and arid ecosystems, reflecting the topography and climate of the country. The richness of its biodiversity is illustrated by the fact that 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 seventy-five species of fish. Insects are the most numerous fauna group with over 12,500 species having been discovered, of which 2,000 species are described as new species for the world. In terms of flora, 2,823 species of vascular plants, more than 1,300 species of algae, 445 species of moss, and 900 species of lichens and of fungi are found in Mongolia, many of which are endemic to Mongolia and Central Asia.

This biodiversity has traditionally played a significant role in Mongolian life, with 845 species of medicinal plants, one hundred are currently being used for medicinal purposes; more than two-hundred for pharmaceutical purposes; and twenty species for herbal tea making. There are 120 species of food plants, including trees, berries, grasses, and wild onions etc. with the number being used as food depending on local customs. In terms of pasture maintenance, more than 1,000 species are used for livestock grazing purposes and there are 68 species of soil-binding plants. Some 59 mammal, 128 game birds, and 30 fish

species are used commercially or for subsistence. 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 but also reflects the harsh 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 mechanical composition. 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 of Mongolia Academy of Sciences. However most collections are in a poor state as economic difficulties associated with the transition to a market economy are said to have negatively impacted the government's ability to provide adequate funding for preservation activities and 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 level of knowledge, government research institutes have the potential to serve as national taxonomy focal points.

4.3.2 Environmental Policies and Programmes

Mongolia's National Action Plan on Biological Diversity Conservation Activities, adopted in 1996, examines the state of biodiversity and the threats thereto and establishes long-term conservation, restoration and proper use objectives and actions. Preparation of the plan included multi-stakeholder participation from both the public and private sector, were 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 but Mongolia acknowledges that 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 over the last five years including environmental protection, natural plants, natural plants use fees, and hunting permission and payment. Laws have also been approved by the Parliament and Government of Mongolia 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 forty 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 thirty 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 was concluded and it participates in the Altai Sayan region project with Russia, China, and Kazakhstan.

The botanical gardens in Ulan Bator 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 IEAs and makes use of biological resources for sustainable development difficult. Despite the widespread provision of Internet services, a lack of computers and inadequate financial support impedes the effective use of these services.

4.3.3 Traditional Knowledge

Mongolia has a considerable body of traditional knowledge mainly with respect to livestock breeding, medicinal uses and pasture management. However, the Mongolian Patent Law stipulates that although medicinal products including those derived from microbiological methods can be patented, methods of treatment may not. There has been no attempt to incorporate traditional knowledge or practices into the National Action Plan. Although Mongolia has entered into a number of joint ventures with respect to the conservation and utilization of genetic resources, there are no laws addressing access by other countries to genetic resources. There is a considerable body of both general and specialized information on biological resources. Access to and use of this information is 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. Mongolia intends to focus on improving and enhancing access to its environmental information system structure; on strengthening co-operation between research organizations and improving the standards and quality of information, analytical capacity, and personnel training.

4.3.4 Biosafety and its Challenges

Mongolia recognizes the important role that biotechnology can play in its sustainable

development while at the same time is aware of the need to protect fragile ecosystems from potential negative effects of GMOs. At the same time, Mongolia acknowledges that it has very limited capacity in biotechnology, with low production capacity and no institutional capacity for risk assessment and management. There are 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. All developing countries face this situation in varying degrees and Mongolia sees this limitation as a threat to the successful implementation of the CBD.

However, Mongolia is looking to be involved in biotechnology research as resources permit and has

an active interest in ensuring the fair and equitable sharing of benefits of biotechnology as well as in access to such technology. 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. Discussions have been initiated on elements of a policy framework for national biosafety management. Mongolia is looking to designate biosafety focal points and to starting biosafety enabling activities as well as to prepare a National Biosafety Framework and legislation in the near future. Importance is attached to preventing the introduction of and to controlling and eradicating alien species that threaten ecosystems, habitats, and

Conservation of Traditional Knowledge in Mongolia

Traditional Methods of Protection and Use of Local Flora and Pastures by the Nomadic Population of Central Asia (based on a presentation made by Guriin 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, despite the fact that much of knowledge and practice tend to be primitive and inconsistent and to reflect the influence of religion. 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. A study of the names of wild flora in Mongolia, for example, can often shed light on both practices and history, clearly demonstrating the benefit of an integrated approach.

Interestingly, similarities can often be observed between the Mongolian, Turkic and Kazakh or Russian names of certain non-fodder crops, telling of a shared history. Mongolian herders' understanding of the wild flora environment and its relationship to their culture and livelihood is captured by the names of the various crops with names like bridle, dog's tongue, bird's leg, lama's head. Forage crops are central to the nomadic lifestyle and not surprisingly, these wild flora have Mongolia names that appear also to have influenced the Russian names. Non-fodder crops such as wild herbs used for medicinal purposes tend, on the other hand, to have Tibetan or Chinese origin names. The potato is known by a Chinese origin, Russian origin, and Mongolian name, depending on the part of the country. In general, the names of cultivated plants used for agricultural and for garden vegetables reflect the origin of introduction.

It appears that the widely held view that the nomadic population relied entirely on animal products is incorrect as there is evidence of widespread use of wild flora, including a number of cereals, herbs, onions, mushrooms and berries in the diet. The availability of different wild flora depends of course on climate and topography and the harsh climate of Mongolia is not conducive to the extensive cultivation of grain.

Local populations used a wide variety of plants such as rosebay and dog rose as tea substitutes, using a process of fermentation and drying. Since the People's Revolution, there has been a growing use of wild herbs for medicinal purposes, many of which may have an application in the

modern pharmaceutical industry. Plant resources have long been used for utensils, ropes, baskets, brooms and other everyday items, although there has been less use of plants for dyeing of textiles or tanning leather than in Central Asia, reflecting the state of handicrafts in Mongolia.

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 eighteenth 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.

What is particularly striking is the relationship between the knowledge of flora and pasture crops and livestock management practices. 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.

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 lack of human and institutional capacity for biotechnological research, evaluation, and risk assessment also impacts the capacity to formulate national legislation. Mongolia, acknowledging that legislation, administrative and policy measures are not yet adequately developed, has expressed the intention to develop a regulatory and policy framework, based on provisions of the CBD to which Mongolia is a party.

With a view to achieving its goals with respect to biodiversity conservation and sustainable use Mongolia 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. For its part, Mongolia has 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 as a basis for the development of the appropriate legislation, 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.

Mongolia also intends to nominate experts on risk assessment and set up a national authority and an institutional organization and to analyse and prepare case studies on issues of national intellectual property rights in relation to CBD and ABS as a precursor to reviewing national laws on property rights. Recent years have seen increased allocations to biodiversity conservation in the national budget but ultimately, as stated in the report, the future of biodiversity conservation in Mongolia will depend largely on the international financial and technological assistance.

4.4 Tajikistan

4.4.1 Biological Resources and Environmental Pressures

The richness of Tajikistan's biodiversity can be illustrated by the fact that it is home to the same number of species as Kazakhstan, a country almost twenty times its size. Tajikistan has many endemic and relic species of flora, rich fauna, and unique

ecological systems and is a centre of origin for the genesis of many cultural species of plants. These wild relatives of cultivated plants and animals are a valuable, rich, and unique genetic fund for the further selection activity. The ecosystems of Tajikistan and its biodiversity are in delicate equilibrium and are vulnerable to the impact of anthropogenic activities. The report states that the mountain ecosystems of Tajikistan and their unique biodiversity are of great regional importance. Like other countries of the region, Tajikistan faces increasing pressures on its biological resources with emphasis shifting from biological resources as a genetic, economic, cultural-aesthetic heritage to regarding these resources as objects of consumption, with attendant effects on habitat.

History, geography and the peculiarities of climate, have contributed to the unique richness of biodiversity. Mountains comprise ninety-three per cent of the terrain of Tajikistan that represents a huge pyramid rising from the desert, with about fifty 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 relic species of plants and 162 animals. It is estimated that 1,500 kinds of herbs are used in traditional medicine, and that 70 species of herbs have entered into official medical practice though in many cases the natural stock is not sufficient to allow for wide spread use. This diversity is further illustrated by the fact that more than 1,000 species are a direct part of the natural forage stock; there are 2,233 naturally occurring specific and intraspecific taxa of both micro- and macroscopical mushrooms and a genetic fund of 1,457 kinds and varieties of wild-growing fruit plants. The fauna of Tajikistan includes 84 species and subspecies 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.

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 its 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 "stationeries" 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 lists 4 species of fish, 21 species of reptiles, 37 species of birds, 42 species of mammals and 58 species of invertebrates as well as 226 species of rare and endangered plants concerning 129 genera and 52 families. It is prohibited to gather plants or to catch and hunt species listed in the Red Data Book and legal penalties are provided for 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 otherwise allows.

In recognition, *inter alia*, that collective action is needed to respond to the pressures that modern development places on the ecosystem and its biodiversity, 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 of the Republic of Tajikistan (NBSAP).

The project document of the NBSAP, prepared by the government after wide ranging discussions at the national and local level, with the support of UNDP and GEF and the involvement of all stakeholders, sets out the basic strategic directions for the conservation of biodiversity and the sustainable use of biological resources based on scientific analysis and recommendations of the scientists, taking into account also public opinion. The NBSAP proposes solutions and responses according to established priorities, and identifies the appropriate level of authority. It was considered and approved in June 2002 by the Second International Scientific Conference on the “Ecological Features of the Biological Diversity” with the participation of the leading scientists of Tajikistan and neighbouring countries, as well as representatives of the Governmental Working Group on the Strategy elaboration, and public and non-governmental organizations. It is expected that the document will be submitted to the government in the near future for its final consideration and approval.

4.4.3 The Legal Framework

The protection, preservation, and sustainable use of biodiversity of Tajikistan are defined in Tajikistan’s Constitution and the law “On nature protection” (27.12.93) is of particular importance for the conservation and the use of biodiversity. This

law, together with associated organizational, legal, economic, and educational measures, 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 the size of damage for violation of the legislation of the Republic regarding the protection of fauna and flora (1996 and 1997); and the rate for calculation of the size of damage 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).

In summary, Tajikistan has the political, legislative, and institutional base with which to promote the implementation of the NBSAP once approved by the government. However, it is recognized that, 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 organizations.

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 organizations, have access to all genetic resources for purchase and reproduction. Gathering herbs and food plants, fishing, and hunting of animals and birds, including big mammals and birds of prey is not allowed. Although access to the 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 yet any legislation specific to this issue.

Access to genetic resources, benefit-sharing, and intellectual property rights had previously been regulated within the framework of the legislation of the former Soviet Union. Not only is this legal framework no longer applicable, nor would it correspond to the changed economic conditions of the present. In this context, it might be noted that the CBD gives no claim over *ex situ* biological

resources prior to the Convention coming into effect. It is therefore not simply of historical interest to note that a great amount of genetic resources gathered in Tajikistan over the years remains in the Russian Institute of Plant Breeding. Framework Agreements with Russia, Uzbekistan, Turkmenistan, India, and some other countries do offer, however, some measure of control with respect to access to genetic resources.

The Custom Codex regulates access to genetic resources from outside the country, but in light of internal and external changes, Tajikistan deems it necessary to pass new legislation.

Tajikistan has recently adopted the law “On Intellectual Property Right”. 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. Tajikistan intends to become a party to WTO and WIPO.

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 systematized.

4.4.5 Traditional Knowledge

The indigenous population and local communities are holders of traditional knowledge relevant to the conservation and utilization of genetic resources in Tajikistan. However, the report states, that there are no traditional practices relating to access to genetic resources and benefit-sharing. It is supposed that the NBSAP will address this gap. A partial inventory of this 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 Towards a Biosafety Policy Framework

Although a number of laws, including environmental laws and laws on health and sanitary and quarantine issues, touch on the issue of biosafety and biotechnology there is as yet no specific legislation in this field. There is legal provision for the registration

of GMOs but new legislation is required with respect to further processing and monitoring.

In January 2002, The Government of Tajikistan declared its consent to accede to the Cartagena Protocol on Biosafety and has appointed an Intergovernmental Committee for the Cartagena Protocol on Biosafety (ICCP) National Focal Point. Participants at a May 2002 multi-stakeholder Biosafety Roundtable highlighted a number of areas requiring action. These include the need to harmonize national legislation with international agreements and the requirements of the Cartagena Protocol; and to prepare legal regulations to foster control for exportation and importation and the storage, transportation and packing of the food, fodder, seed selection, and other products containing genetically modified components.

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 the scientific research in the field of biotechnology and biosafety and the control of the quality of the genetically modified organisms were also identified. Participants called for greater collaboration with the Secretariat of the CBD, UNEP, and other international organizations and institutions and with international scientific centres and institutes working in the field of genetic engineering, molecular biology, biotechnology, and biosafety.

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. It was suggested that the specialized institutes of Academy of Sciences of the Republic of Tajikistan and Tajik Academy of Agricultural Sciences facilitate this by providing the necessary scientific information, both domestic and international, on biotechnology, genetically modified organisms, and other related issues; and organize the 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 the produced and imported GMO production.

In this regard, Tajikistan has identified priorities including a full and systematic inventory of the genetic potential of the country; 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; ratification of the Cartagena Protocol on Biosafety; 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 cultural plants, animals, and their wild relatives; the creation of the network of agro-ecosystems and optimization of urban territories. Finally yet importantly is the need to create partnerships in order to develop and attract the necessary resources for the conservation and sustainable use of biodiversity.

4.5 Turkmenistan

4.5.1 Biological Resources and Environmental Pressures

Turkmenistan's biological diversity reflects the unique characteristics of its landscape diversity, with eighty per cent being desert or semi-desert and the remaining twenty per cent mainly sandy desert forests. The greater part of the country is a desert plain with mountains accounting for less than one fifth of its territory. Turkmenistan is at the conjunction of three large floristic provinces—the Kopetdago–Horasan, the Montane Central Asian, and Turan—with two transitional regions (Badkhyz and Karabil) and exhibits the features of the Central Asian, Mediterranean, and Turan desert floral landscape.

Natural ecosystems have played a key role in helping conserve wildlife in Turkmenistan which has a 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. In addition to the evolution of ancient forms of cultivated plants and local breeds, new varieties are also being produced synthetically with modern techniques. However, as elsewhere in the region, the biodiversity of Turkmenistan is under pressure as a result of the destruction and degradation of habitat, overexploitation and the introduction of non-native species.

The Red Data Book of Turkmenistan published in 1999 provides information about the conservation of threatened plant and animal species and list 261 species as being threatened, an increase from 152 in 1985 due to the inclusion of invertebrates, fungi, lichen, mosses, ferns, and gymnosperms. There are seventeen animals and twenty-eight plants that are

in the most threatened category. Species listed in the Red Book are protected from hunting and there are strict regulations governing the hunting season and limits and the species that may be hunted.

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 1,600 species contain biologically active elements (potential medicinal raw materials), including 600 used in the perfume industry, 700 used in foodstuffs, 160 used in the dyeing industry, nearly 50 containing potash and more than 800 used as food. Liquorice is an economically important plant as are the five per cent of Turkmenistan plants used as dyes. Measures have been taken recently to restore and reintroduce ancient natural dyes into the carpet industry.

4.5.2 Environmental Legislation and Ecological Policy

The Ministry of Nature Protection is mandated to oversee the efficient consumption of natural resources and environmental protection as well as the development of the national forest estate. A state inter-ministerial committee established in 1999 by Presidential Decree coordinates implementation of commitments under Multilateral Environment Agreements and the development of the National Environmental Action Plan (NEAP). The latter is a permanent planning document, with a special working group on biodiversity conservation, and 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 is a party to a number of international conventions and attaches importance to implementing universally recognized norms and principles of international law in the field of environmental protection. International conventions relating to biodiversity conservation are part of the national legal system and Turkmenistan's actions under the CBD, ratified in 1996, will strengthen its

existing commitments under other multilateral environmental conventions and agreements.

In general, existing laws are adequate although there is room for some laws to be strengthened or reformed to bring Turkmenistan into conformity with its international commitments, as is recognized by the 1999 law “to introduce changes and additions to some legal texts of Turkmenistan”.

Turkmenistan’s National Biodiversity Strategy and Action Plan (NBSAP), developed with multi-stakeholder participation and overseen by the State Commission, provides the mechanism to fulfil obligations under the BCD. In addition to providing an overview of the status of biodiversity in Turkmenistan and social, economic, and natural conditions in various parts of the country and the threats to natural ecosystems, the Plan is intended to provide a detailed breakdown of the country’s biodiversity conservation strategy, outlining necessary first steps in the process of long-term conservation, restoration, and sustainable use.

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 and, accordingly, the NBSAP contains a special package of measures for ex-situ conservation of Turkmenistan genetic resources, including support for the Garrygala centre and its work on agro-biodiversity

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 *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. Located in Western Kopetdag, an area of particularly rich plant variety, Garrygala has played a significant role in the development of regional varieties of fruit crops and was formerly a department of the Soviet Union Institute of Crop Production and a member of the Soviet Union All

Union Plant Cultivation Institute. However, since its withdrawal from that institute, Turkmenistan’s access to the 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 also cooperating 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 (tebibis) as remedies for different diseases. Using methods transmitted from generation to generation, the folk healers (tebibis) 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). Based on the latter, any folk healer (tebib) may register and receive protection for the medicinal means created by them. Turkmenistan is not a member of the WTO.

4.5.5 Biosafety

Despite biotechnology’s growing importance, Turkmenistan has undertaken no special work on biotechnology or research on GMOs and their products, due to a lack of capacity to study the influence of GMOs on living organisms. The administrative and science capacity for liability, monitoring, and control is lacking. Not surprisingly, given these gaps, administrative standards and specific laws on biosafety and on ABS with regard to biological and genetic resources 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 would also be the organizations tasked with risk management and risk assessment related to GMOs. Turkmenistan is currently considering ratification

of the Cartagena Protocol and Biosafety and is interested in participating in the UNEP/Global Ecological Fund (GEF) Global Environment Facility Project on the “Development of National Biosafety Frameworks”. 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.

4.5.6 The Challenges of Implementation

The general status of biodiversity conservation in Turkmenistan is said to be relatively satisfactory with major elements of all ecosystems having been preserved. Most of Turkmenistan’s efforts in this regard have been focussed on meeting the requirements of the CBD (identification and monitoring; *in situ* and *ex situ* conservation; sustainable use of components of biological diversity; incentive measures; research and training of specialists; public education and awareness; data exchange; technical scientific co–operation and others). Turkmenistan has already begun the process of creating a unified informational network about the environment.

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. Turkmenistan also has a well developed legal system for biodiversity and a network of eight zapovedniks with zakazniks which work to protect habitat restricted species and those listed in the Red Book and to control anthropological pressures on the country’s biodiversity. 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.

Methods for evaluating the economic significance of genetic resources have yet to be developed and these resources therefore remain undervalued; and the role that biodiversity and genetic resources in particular play in advancing sustainable development is not fully appreciated. As a result, conservation issues tend not to have been integrated into development plans.

Despite some progress in the field of nature protection, Turkmenistan still faces challenges in conserving its biodiversity and some legal reforms and policy changes will be required to bring Turkmenistan into closer harmony with the CBD. There is acknowledgement that legal reforms and policy changes are needed in order to bring its regime

into closer conformity with the requirements of the CBD and has made provision for these reforms in its 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.

The report has indicated that a specialist training system for biodiversity conservation has not been effective and that reductions in staffing of scientific departments have led to a decrease in the quality of monitoring, and weakened their role as scientific research organisations. 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. This lack of scientifically grounded, cheap, and reliable indicators of biodiversity in turn influences the quality of monitoring.

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 Uzbekistan

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 and Uzbekistan is an important habitat for endemic animal species of Central Asian origin. Although less than ten per cent of plant species are endemic, there is an endemic rate of fifty–two per cent for fish. Uzbekistan’s biological richness can also be illustrated by the role that fault–line reservoirs and reed beds play as stopping–off places in the migration of waterfowl and nesting and habitation sites respectively.

The desert ecosystems of Uzbekistan, which together with semi–desert ecosystems comprise eighty–five 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. As further illustration of the biological richness of these ecosystems it might be noted that more than 937 plant species found in the Kizilkum desert alone and that more

than fifty per cent of the 320 flower species found in the sandy deserts are endemic (the remainder are iran-turanian, turan-kavkaz and turan-european species). The rocky deserts in turn are home to eleven species of reptiles, one hundred species of birds and eighteen species of mammals, the most common being the great gerbille, the Severtsova jerboa and small five-toed jerboa. Some 304 plants species are found in the saline deserts with four per cent being endemic to Uzbekistan and twenty-six per cent endemic to Central Asia. Clay deserts, where the middle Asian turtle, lizards, and chasers are found in the clay deserts. These deserts exhibit similar fauna composition to that of rocky deserts but are disappearing because of human habitation.

Diversity is also found in the highland steppes and river and riverside ecosystems that, together with wetlands and deltas, account for the remaining fifteen per cent of the territory. 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 river ecosystems, it should be noted that significant masses of tugai (gallery forest) are preserved in isolated icelands or narrow strips in valleys and deltas.

Biodiversity plays an important role in the livelihood of those working in the forest, medicinal plant, hunting and fishing, and animal husbandry sectors as well as for the tourism and recreation. In some instances, these activities are undertaken by legal entities within a commercial framework while in other instances biological resources are used by persons free of charge for basic living needs (common usage of nature). 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 is being recognized as both an economic activity and a means of generating resources for biodiversity conservation.

Despite the importance to the economy of natural resources, 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. The development of the irrigation sector of agriculture and the ensuring loss of habitat and increased salinity has been particularly pronounced in the area around the Aral Sea. These habitat changes have disproportionately affected the vulnerable desert, semi-desert, and mountain ecosystems and have had an attendant and compounding effect on climate. More recently, attempts at restoration has been made. 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, in accordance with its obligations under the CBD and as approved by the government in 1998, which attempts to respond to the challenges facing the ecosystems and biodiversity of the country. The strategy evaluates for the first time the state of biodiversity in the country and analyses its conservation and utilization 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 organizational 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.

One of the challenges that Uzbekistan has identified is that of establishing a scientifically justifiable system of special protected areas that encompasses all ecosystems and has all categories clearly identified and defined. 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, as well as "units" where temporary or seasonally conservation requirements are in place and where there is increasing pressure for exploitation of resources. Altogether these areas amount to 4.6 per cent of Uzbekistan's territory but 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.

In terms of engaging the public, the mass media provides quite extensive coverage of environmental issues and progress has been made within the educational system in raising public awareness. Progress has also been made with respect to local biodiversity action plans, with plans now being implemented in Jizak, Fergana, Khorezm, Kashkdar, Tashkent and Samarkand province.

4.6.3 The Legal Framework for Biodiversity Conservation and Sustainable Use

Uzbekistan has established institutes for the management and utilization of biodiversity and protected areas and has a sound legislative framework. However it acknowledges the need to strengthen and enhance the natural environment protection system and the control of anthropogenic activities as well as for greater participation in both the conservation of biological resources and greater benefit-sharing from their utilization. Institutions for the management and control of biodiversity conservation and sustainable use are in place and Uzbekistan has the necessary legal framework for this task.

Access to genetic resources and benefit-sharing is addressed specifically in a number of pieces of legislation (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.

However, the report points to the need for greater co-operation between all interested parties if Uzbekistan is to be able to meet its goals in these areas. In the case of biosafety, the regulatory framework is as yet embryonic and reorganization of administrative and institutional mechanisms is said to be required.

4.6.4 Traditional Knowledge

Traditional knowledge handed down within communities 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.

There is protection of intellectual property in accordance with the Constitution of Uzbekistan and Part IV "Intellectual Property" of the Civil Code of the Republic of Uzbekistan which entered into force on 1 March 1997 addresses intellectual property in a comprehensive manner. Uzbekistan is a member of WIPO and plans accession to UPOV.

4.6.5 Biosafety

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. Biosafety regulation is in its infancy but the Academy of Sciences, together with other interested ministries and departments, has examined the issue of importing GMOs. Uzbekistan has advised that it is possible to import GMOs, but as of when the report was compiled, there had been no 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 and Responses: Conclusion and the Way Forward

5.1 Identifying Capacity Development Needs

Whether considered individually or as part of a region, the countries that participated in the workshop 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 prioritized 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 participants of the workshop. During the workshop in Mongolia as well as through the country reports that have been prepared by the Central Asian countries and Mongolia, critical capacity development needs have been identified. 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; and 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. In many cases the fact that collections of biological and genetic resources of many of the countries of the region remained in

Russia after the break-up of the former Soviet Union 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 use of genetic resources.

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. The need for such approval will depend on whether legislative or regulatory change is proposed in the NBSAP but, regardless of need, legislative approval of a strategy and action plan sends a strong signal of interest and intent.

5.1.2 Legislative Base

All cite the need to strengthen the legislative base. Even those countries like 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. This is particularly so in areas relating to the transition from planned to a market economy that has been experienced by all the countries of the region recent years. 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.

5.1.3 Inadequate Information

Inadequate information is a common theme throughout the region. This can be, and often is, an issue at all levels of society, from policy makers, programme managers, and scientists to citizens and local communities. Kazakhstan acknowledges that the analysis on which its NBSAP is based highlights the incomplete state of inventories, mapping, and accounting of biological resources. 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, the repository of so much information and a key tool for information management. Mongolia specifically notes that the lack of computer capacity in this regard significantly inhibits its ability to avail itself of this important tool.

5.1.4 Scientific and Technical Expertise

In terms of scientific and technical expertise of the countries of this region, their capacity to develop and implement appropriate policies with respect to ABS has been negatively 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. It is difficult to say whether lack of experience in biodiversity planning is any greater in Central Asia than in other parts of the world. It is only recently that policy makers around the globe are coming to understand the complexity of biological conservation and its cross cutting importance, but it is fair to say that the challenges for the region to respond to biodiversity planning and policy development are exacerbated by the need to respond to structural change as well as to new environmental challenges.

5.1.5 Institutional Coordination: Mainstreaming Biodiversity

Institutional coordination within governments and between governments and stakeholders is a critical factor in the development and implementation of effective policies to advance biodiversity concerns and ensure its contribution to sustainable development. It is for each country to decide on the balance it wishes to achieve between conservation and exploitation, depending in large part on the domestic economic and political situation. This balance may be difficult to achieve but once decided on, coordination itself fortunately depends more on an understanding of its importance rather than financial resources per se.

Lack of coordination is by no means unique to the countries of the region and the universal challenge for all policy makers is compounded by the complexity of translating a biodiversity strategy into a costed and prioritized action plan and a general scarcity of

examples of the effective integration of biodiversity considerations into sectoral or cross-sectoral planning. 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 recognize 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 such as exists in the Kyrgyz Republic.

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 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. Kazakhstan and Uzbekistan also point to the need for greater co-operation between all interested parties if biodiversity goals are to be met and NBSAPs implemented. Lack of coordination between stakeholders is cited as a barrier to successful implementation and the importance of political support and public awareness and engagement are highlighted, as is the need to recognize that a strategic plan is a long-term proposition. The challenge is that of understanding the complexities of biodiversity conservation and, having attempted to do so, of translating a biodiversity strategy into a costed and prioritized action plan is universal.

5.1.6 Increased Public Education and Awareness

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 acknowledge the need for increased public education and awareness to build this support

for action, even those with an active environmental education programmes such as Tajikistan and Uzbekistan. Turkmenistan, for example, has identified as urgent the need to increase public awareness of environmental issues.

5.1.7 Financial Limitations

All countries of the region cite the 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, last but by no means least, of recruiting and retaining staff in these areas.

5.1.8 Direct Economic Pressure on Ecosystems

The region as a whole is experiencing direct economic pressure on ecosystems, with the Aral Sea that borders Kazakhstan and Uzbekistan being perhaps the best known example of the effects of these pressures. Many of the ecosystems under pressure are not only fragile by virtue of the natural terrain but are also important centres of origin for many species of both biological and economic importance. This report is not the place to analyse the cause of these pressures or relative budget allocations but clearly, the financial constraints that these countries are facing limit the ability to undertake mitigation efforts on a significant scale.

5.1.9 Developing ABS and Biosafety Law and Policy: Capacity Development Needs Identified by the Bonn Guidelines and Central Asian Reflections

The Bonn Guidelines provide more specific guidance on key areas requiring capacity development to support the effective implementation of the CBD, acknowledging differences between countries in terms of their specific situations, needs, and capabilities. While focussed on ABS, rather than the broader area of biological conservation, the Guidelines are particularly instructive in terms of suggesting areas for follow-up action from the discussions of the workshop.

Others key areas identified include the assessment, inventory and monitoring of biological resources and traditional knowledge; the valuation of genetic resources and market information; the development of inventories and case studies of existing legislative measures and of appropriate legislation; and the development of information systems and information management and exchange. The Guidelines also call for capacity development in scientific and technical areas, including technology transfer in areas relevant to access to and use of genetic resources and benefit-sharing and with respect to the means for protecting traditional knowledge. Funding and resource management are also highlighted as is the importance of developing instruments, tools, and indicators to monitor and assess the implementation of capacity development for access to genetic resources and benefit-sharing at all stages.

During the workshop, the participants tended to emphasize the challenges their countries face in implementing their respective NBSAPs rather than focusing on those elements specific to the development of an ABS policy and regulatory framework or a biosafety regime. This is understandable as the need for scientific capacity; protected areas and general environmental legislation are the foundation for the further elaboration of these subsets of the biodiversity policy universe. While some of the key areas for capacity development identified in the Bonn Guidelines are specific to the task of developing an ABS regime, most are of general relevance. To name a few, these include the strengthening of institutional infrastructure; assessment, inventory, and monitoring of biological resources and traditional knowledge; public education and awareness; human resources development and funding and resource management. Thus, there is the potential for a certain multiplicity of benefits in that capacity development in many of these areas will help advance environmental goals and objectives in general.

The guidelines also set out processes and measures that should be undertaken and suggest means of implementation. Interestingly, and logically, one of the processes to be undertaken is to establish a sequence of actions. This suggests itself as a possible topic for future discussion in terms of regional co-operation. One of the key issues that will have to be faced is how to address the information gap and how to proceed in the face of incomplete inventories and limited means for information gathering and management, all of which are resource intensive areas.

Decisions will also be required as to whether the most urgent or the most "doable" will take precedence; the extent to which common or mutual interest has priority over environmental significance; whether there is a scientifically necessary starting point e.g. to establish data bases or whether policy and regulatory initiatives can be initiated in the absence of complete knowledge; and how to balance the desire for early

results with the fact that biodiversity issues are by their very nature long-term propositions. The success of both an ABS framework agreement and of a biosafety regime will depend in large part on the ability to assess the benefit or the biological risk. This is a challenge for all countries, but particularly those facing constraints in their ability to undertake such analysis. Biological risk assessment is case and ecosystem specific, whether undertaken in the importing or exporting country, and as such is perhaps the more challenging, particularly to the extent that it requires highly sophisticated scientific or technical analysis. Benefit analysis will likely be undertaken by the party seeking access, with the results subject to the concurrence of the country providing access to its biological resources. It tends to be based on economic rather than environmental considerations and can, *mutatis mutandi*, be applied in different situations. In establishing regional cooperative efforts to advance the development of their respective regimes in these areas, it will be important to consider capacity development needs in terms of assessment to ensure that any policy and regulatory framework that may be put in place can in fact be made operational.

Another common element of both ABS frameworks and biosafety regimes, and an area where considerable work is being undertaken internationally, is that of prior informed consent (PIC) regimes. The PIC process is key, both to ensuring biosafety and to facilitating the movement of biological resources on mutually agreed terms, thereby allowing the country of origin to benefit from those biological resources to which they are prepared to give access. Again, this is an area where the availability of information and analysis are critical to sound decision-making and countries of the region might wish to give particular consideration to their capacity development needs in this respect.

5.2 The Way Forward: Practical Measures to Assist Central Asian Countries and Mongolia

5.2.1 Development of the "Central Asian and Mongolian Biosafety and Bioresources Network"

During the workshop, the participants drew up a strategy paper "Practical Measures to Assist CA Countries and Mongolia". Based on the findings detailed in the paper the participants decided to create a "Central Asian and Mongolian Biosafety and Bioresources 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 also aims to develop databases on legislative, administrative, and policy measures taken by countries of the region; on networks of existing collections and scientific institutions working on genetic resources and traditional knowledge; and provide directories of contact points as well as case studies on best practices and on possible sources of finance. It will also look at the possibility of initiating a training programme to develop capacity with respect to biosafety risk assessment and awareness; integrated approaches; and food safety and to explore the possibility of convening a regional biosafety workshop on National Biosafety Frameworks.

Among longer term consideration for the network will be exploring mechanisms for developing taxonomic information and standardizing taxonomic nomenclature within the region, and to the feasibility of developing a Red Book for the region and a regional typology for ecosystems.

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 nominating focal points to relevant processes; developing a manual on basic international diplomacy and negotiations; and training of young scientists. UNU/IAS is supporting this work. Other action that UNU/IAS is taking to support the network in close co-operation with participating countries include developing and hosting a network web page.

5.2.2 Biosecurity II: A Step Ahead in ABS, Traditional Knowledge, and Biosafety in Central Asia and Mongolia

A second capacity development meeting will take place in July 2003 in Kyrgyz Republic. The objective of this workshop—Biosecurity II: A Step Ahead in ABS, traditional knowledge, and Biosafety in Central Asia and Mongolia—is to elaborate and prioritize identified capacity development needs and to further capacity development, intensify co-operation, and deepen knowledge and awareness among the regional stakeholders with a primary focus on ABS, traditional knowledge, and Biosafety, and their relation with the international trade regime and other international agreements. The workshop is targeted at representatives from government, academia, and civil society.

In particular, the workshop will support further debate on the implementation of the Bonn Guidelines on ABS and will focus on the exchange of experiences with respect to controlling access to

genetic resources, protection of traditional knowledge and promotion of equitable benefit-sharing. This workshop will seek to develop a better understanding of the specific challenges posed by the agreement reached at the WSSD to negotiate an international regime on benefit-sharing and to raise awareness of upcoming negotiations during the WTO Doha Ministerial Round and the entering into force of the ITPGRFA. There will also be an exchange of national experiences in developing biosafety regimes at the national and regional levels, and mechanisms for identifying sources for financial support will be explored.

5.2.3 Increasing Stakeholder Participation in International Negotiations

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 by the participants of the workshop (See chapter 4 and 5.1). 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 the importance of this need 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. An effective way of beginning to address this gap would be to hold special briefings and training for the countries of Central Asia and Mongolia before, during, or after relevant meetings.

5.2.4 Increasing the Knowledge Base

The countries of the region have expressed the need for greater and more readily accessible information on policy-making, and examples of best practices and protection of traditional knowledge (See chapter 5.1.3 and 5.1.4). The countries of Central Asia and Mongolia might find it useful to seek the support of an international network of institutions working on ABS capacity development, which is being promoted by UNU/IAS and IUCN/ELC, as well as other initiatives that are producing case studies on existing ABS regimes and their effectiveness.

UNU/IAS is also currently carrying out a number of studies relating to the protection of traditional knowledge, including a case study of the implementation of traditional knowledge law; the preparation of a comparative analysis of the use of registries to protect and maintain traditional

knowledge in co-operation with WIPO; and the preparation of several case studies examining the role of customary law and practice in the protection of traditional knowledge and its relation to national ABS legislation. In addition, UNU/IAS is preparing a comparative analysis of existing experiences in the use of PIC procedures in ABS governance with a view to identifying best practices of the effectiveness of PIC as a tool for managing access and securing equity in benefit-sharing.

These case studies could be of interest and value to the region as examples of both successful and unsuccessful experiences in ABS governance.

5.2.5 Increasing International Awareness

The lack of international support currently experienced by the countries of the region stems in part from a lack of awareness in 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 marginalized regions for the development of ABS law and policy.

The means and ways through which the information in this report is most effectively disseminated needs to be explored. This report is an important first step for greater access to and visibility of Central Asia and Mongolia in intergovernmental fora.

Appendix: 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.

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The Institute of Advanced Studies of United Nations University (UNU/IAS) was inaugurated in April 1996. We conduct research, postgraduate education, and capacity development, both in-house and in cooperation with an interactive network of academic institutions and international organisations.

The thematic direction of our research concerns the interaction of social and natural systems. Thus, our research combines the social sciences (law, economics, politics, and policy) with some of the physical and life sciences (genetics, ecology, and biology) at both theoretical and applied levels, and is aimed at the development of informed policy-making to address global concerns.

The current research agenda focus on strategic paths to sustainable development, and under this broad theme, our projects examine issues of biodiplomacy, sustainable development governance, urban ecosystems, science and technology policy options for developing and least developed countries, and education and sustainable development.



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