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PROTECTED AREAS

Biodiversity Access and Benefit-sharing Policies for Protected Areas: report submitted by the Institute of Advanced Studies of the United Nations University

Note by the Executive Secretary

1. At the request of the Institute of Advance Studies of the United Nations University (UNU/IAS), the Executive Secretary is circulating herewith, for the information of participants in the ninth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), the UNU/IAS report *Biodiversity Access and Benefit-sharing Policies for Protected Areas: An Introduction*.

2. The report is being circulated in the form and the language in which it was received by the Secretariat of the Convention on Biological Diversity.

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Institute of Advanced Studies

UNU/IAS Report

Biodiversity Access and Benefit–Sharing Policies for Protected Areas

An Introduction

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UNU/IAS Report

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An Introduction

November 2003

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Foreword

The Vth IUCN World Parks Congress, held in Durban, South Africa from 8-17 September 2003, once more drew attention to the role of protected areas in biodiversity conservation. The relevance of bioprospecting in this regard lies in the fact that, in recent years, bioprospecting in protected areas has yielded valuable commercial products. This has lead, and continues to lead, to the perception that genetic resources found in protected areas are reservoirs of genetic material that could in future serve important functions in agriculture or medicine.

Despite this perception, little attention has been paid to how this newly emerging role for protected areas could be addressed by protected area managers, who act as 'gatekeepers' in the absence of well–developed national access and benefit–sharing (ABS) measures and implementing procedures. The ABS framework, which includes protected area ABS policies as well as national and international law, provides the legal and regulatory mechanisms necessary to realize the 'option values' of genetic resources. It also provides protected area managers with bearings and direction at a time when perceptions and practices associated with biodiversity research and bioprospecting, genetic resources, and protected areas are undergoing rapid and dramatic change.

The report's objective is to assist protected area managers in addressing these rapidly evolving issues. It considers the role and value of bioprospecting and its relation to protected areas, and examines the potential of bioprospecting in tapping into non-traditional sources of funding, a need many protected area managers face. The report also reviews the international and national policy context for ABS and outlines some of the key issues that protected area managers need to consider in developing their ABS policies. The report concludes with specific recommendations that aim to assist protected area managers in grappling with this complex field.

Development of this report is part of the wider programme on biodiversity at the UNU Institute of Advanced Studies. UNU/IAS was established in 1996 as a research and training centre of the United Nations University to undertake research and postgraduate education on emerging issues of strategic importance for the United Nations and its Member States. Pursuant to its Statute, UNU/IAS undertakes its work in an independent, neutral, and objective manner. A key purpose of the Institute is to promote the interactions between the UN System and the academic community. UNU/IAS' work is currently focusing a significant amount of its efforts on research of international biodiversity policy, with a particular emphasis on ABS issues.

A H Zakri
Director, UNU/IAS

1 Introduction

In the last fifteen years, the legal and policy framework for biodiversity research and bioprospecting, and the perception, exchange and use of genetic resources has been transformed. This brings new obligations to those serving as 'gatekeepers' of national biological and genetic resources. In most countries, an absence of well–developed national access and benefit–sharing (ABS) measures and implementing procedures means that the *de facto* 'gatekeepers' are local–level bodies, including protected area managers. New, and widely accepted requirements for documented prior informed consent, the reaching of mutually agreed terms, and ensuring the equitable sharing of benefits from both academic and commercial research are now the responsibility of these groups.

Over–worked, under–funded and often beleaguered protected area managers have understandably been slow in taking up ABS issues, which are not only complex but often also contentious. Moreover, ABS issues must compete with other priorities for attention and funds.

Nevertheless, protected area managers are increasingly confronted with ABS cases, and have adopted different strategies to dealing with them. For example, protected area managers at Yellowstone National Park in the United States sought to maximise revenues for the Park from bioprospecting partnerships. These efforts were met with criticism and controversy arising from changes in the way both protected areas and genetic resources are viewed (see Annex 1). In several of the provincial protected area agencies in South Africa, managers have chosen to await development on national ABS measures, refusing commercial collections until national legislation is in place. In contrast, the South African National Parks and Ezemvelo KwaZulu–Natal Wildlife have developed general bioprospecting policies as part of broader policy initiatives (Boxes 1and 2; see Annex 2). In other cases, such as Bwindi National Park in Uganda, Waza National Park in Cameroon, and Tai National Park in Cote d'Ivoire, protected area managers have taken interim steps to establish protocols for research collaborations, laying the groundwork for more equitable academic and commercial partnerships.

To date, the response from protected area managers and policy makers to ABS issues has largely been *ad hoc*, but this is likely to change in the coming years since protected areas remain a favoured site for biodiversity research and bioprospecting, while the policy context is in a state of flux. Protected area policy makers thus need to provide guidance and assistance to protected area managers to deal with these issues in a more standardised and comprehensive manner.

The ABS framework, which includes protected area ABS policies as well as national and international law, provides the legal and regulatory mechanisms necessary to realise the often–touted 'option values' of genetic resources. It also provides protected area managers with bearings and direction at a time when perceptions and practices associated with biodiversity research and bioprospecting, genetic resources, and protected areas are undergoing rapid and dramatic change.

This report has been prepared to assist protected area managers in addressing these rapidly evolving issues. Section II considers the role and value of bioprospecting and its relation to protected areas. Section III examines the potential of bioprospecting in tapping into non–traditional sources of funding, a need many protected area managers face. Section IV reviews the international and national policy context for ABS. Section V outlines some of the key issues that protected area managers need to consider in developing their ABS policies. Finally, the report concludes with recommendations that aim to assist protected area managers in grappling with this complex field.

2 Bioprospecting and Protected Areas

Bioprospecting is undertaken by companies in a wide range of sectors. Demand for genetic resources, and the ways they are valued and incorporated into research and development (R&D), varies dramatically within and between sectors. For example, in the pharmaceutical industry, scientific developments in the fields of biochemistry, molecular biology, cell biology, immunology, and information technology continue to transform the process of product discovery and development. New technologies, such as combinatorial chemistry, high–throughput screens, and laboratories–on–a–chip, provide unprecedented numbers of compounds to test, with implications for the value of natural products as an alternative route to discovering novel compounds.[1] Driven by scientific and technological developments, natural products research has been cyclical in recent decades. However, it continues to form an important, if small, element of industry R&D programmes, and to contribute significantly to company revenues.[2]

In another example, the biotechnology sector is undergoing significant growth. In the US it has witnessed 16 per cent compound annual growth rate since 1989.[3] European market revenues have increased by 845 per cent over the last five years and are predicted to double by 2005 to $100bn.[4] Emerging biotech sectors in Canada and the Asia/Pacific region have experienced significant growth in the number of companies as new technologies increasingly make their way from research labs into privately funded enterprises. These trends are seen in the use of biotechnological applications in other sectors. For example, the production of transgenic crops increased from 2 to 59 million hectares from 1996 to 2002 respectively.[5] Over 150 biotechnological drugs have received FDA approval and 456 biotechnological drugs are currently undergoing pre–clinical testing in Europe.[6] Continued growth of the biotechnology sector and the increased pervasiveness of biotechnology in other sectors will likely lead to greater examination of novel genetic resources and biochemical process as part of the product development phase of various sectors.

Bioprospecting in protected areas has yielded valuable commercial products in recent decades. Examples include the pharmaceutical Sandimmun Neoral (cyclosporine), marketed by Novartis. Sandimmun Neoral was the thirty–third top–selling drug worldwide in 2000, with total sales of US$1.2 billion.[7] In 1969, a researcher at Sandoz (which became Novartis after a 1996 merger with Ciba Geigy) collected a soil sample in Hardangervidda National Park in Norway. By 1972 the immunosuppressant property of cyclosporine found in the soil sample was identified, and in 1983 Sandoz introduced Sandimmun to the market.[8]

In 1966, the thermophile *Thermus aquaticus* was collected in the geothermal features of Yellowstone National Park in the United States by academic researchers. In 1984, a DNA polymerase enzyme, Taq polymerase, was isolated from *T. aquaticus* and has subsequently been used in a range of biotechnological applications, with annual sales exceeding US$200 million.[9]

Genetic resources and bioprospecting are considered 'option values' held in protected areas: reservoirs

BOX 1 South African National Parks Policy on Bioprospecting (SANP, 2002)

Biodiversity Prospecting

1. Recognising the huge potential value arising from (1) the diversity of plants, animals and micro–organisms in South African ecosystem (2) the ancient competition between plants and animals and the consequent value of secondary compounds and protective and adaptive measures and (3) the relatively long interaction of humans with the natural environment and the consequent indigenous knowledge,
2. Recognising that the rapid growth in human knowledge provides only a short window of opportunity for South Africa to exploit this potential,
3. Recognising that, in the absence of legal use, illegal users will exploit this potential, and
4. Recognising that an important justification for park and biodiversity conservation is to preserve the use value of genes and species, South African National Parks shall immediately and urgently develop the protocols, mechanisms, partnerships and agreements to exploit this potential. Specifically South African National Parks will:
5. Develop legal and procedural mechanisms to enable and encourage comprehensive legal and controlled collection and analysis of all indigenous species, including and especially those in Parks;
6. Develop, to maximum conservation and economic advantage, commercial partnerships with agencies and businesses capable of collecting, analysing, patenting and developing this potential.

of genetic materials that might serve important functions in agriculture or medicine in the future (see Box 1).[10] As the cases of cyclosporine and Taq polymerase demonstrate, the economic value of products found in protected areas is real. Absent is the policy and legal framework necessary to channel a portion of financial and other benefits to the sites of collection, and to serve broader conservation objectives. In the cases of cyclosporine and Taq polymerase, collections pre–dated the Convention on Biological Diversity (CBD), national ABS measures, and protected area ABS policies. Today, the situation would likely be quite different, and the establishment of a sound and not overly bureaucratic regulatory framework is unlikely to drive researchers away from protected areas because protected areas continue to offer researchers unique benefits, including:

- They are home to much of the world's biodiversity and are likely to become increasingly important as repositories of disappearing habitats, species, and genetic resources.
- They provide a stable site with limited or no exploitation of resources, a critical condition for academic studies that monitor ecological change over time, and for commercial researchers who want to ensure that they can return and re–collect a sample that shows promise in laboratory testing.
- Protected area staff is knowledgeable about local ecosystems, communities, history, and research undertaken in the area to date.
- Protected areas offer infrastructure, services, including help with permitting procedures, and logistical assistance, and can facilitate access to biological and genetic resources and interesting sites. Since the staff are familiar with the political, social and economic context of the area in which research takes place, protected area managers provide an intermediary function most commercial and many academic researchers seek.

3 Biodiversity Research and Prospecting as Elements of Protected Area Strategies to Raise Revenue

Countries pay both direct management and opportunity costs to maintain their biodiversity in protected areas and make it available to researchers and companies. A survey in 1999 found that only 1 per cent of protected areas worldwide are considered 'secure' and that a large proportion of protected areas amount to little more than 'paper parks'.[11] While the external threats to protected areas are complex, chronic funding shortages and limitations in human skills and institutional capacity are some of the most consistently cited obstacles to effective protected area management.[12] Expenditure by developing countries on protected areas is significantly less than that of developed countries, with an average of US$157 per km2 compared with US$2,058 per km² in developed countries.[13]

Addressing these chronic funding problems in all countries will ultimately require the protected area network to be managed in a way that contributes to the intellectual and financial capital of the country as if it were used in other ways. Conserved areas are often seen as another kind of land use, one with costs and benefits like any sector.[14] Even in countries with a high tax base, like the cases of Norway and the US cited above, governments rarely allocate sufficient funds to manage their parks. While recreation and tourism can help significantly to this end,[15] protected areas must diversify their income resource base, develop sustainable financing mechanisms, and better harness private financial flows in the service of conservation.[16]

Biodiversity research and bioprospecting can serve as one element in such a strategy.[17] In Costa Rica, for example, the National Institute of Biodiversity (InBio) includes a 'conservation overhead' in the budgets of its commercial research partnerships. Ten per cent of all bioprospecting budgets, and 50 per cent of all royalties, are donated to the Ministry of Environment and Energy (MINAE). As of early 2000, INBio's contributions to conservation areas had reached US$790,000, with another US$400,000 for conservation activities directed through MINAE. An additional US$713,000 went to public universities and US$750,000 to support INBio's activities, particularly the National Inventory Program.[18]

Academic biodiversity research operates in a dramatically different financial and institutional context, and yet it too can contribute to protected area management and support. As Janzen *et al* put it: "...the conserved wildland is, in a sense, a kind of granting agency insofar as it sustains the cost of keeping the organisms alive and maintains the infrastructure that all researchers use."[19] Researchers value protected areas as a site for their work, and protected areas benefit from research, since the scientific data generated is vital to understanding and managing biodiversity within protected areas. Moreover, investigations into ecology, taxonomy, and sustainable management are critical tools for the development of management plans. Even basic research contributes in multiple, if indirect, ways to a comprehensive understanding of species and ecosystems. Few protected areas have sufficient budgets to cover their most basic research needs. However, increasingly, and largely as a result of changed legal and ethical norms for research as discussed in Section IV, researchers are asked to incorporate applied elements or otherwise contribute to protected area information and management needs as part of larger research programs.

4 The Policy Framework for Biodiversity Research and Prospecting

A range of legal and policy developments at the intergovernmental, national, institutional, company, and community levels create the new framework within which biodiversity research and bioprospecting take place. At the intergovernmental level, the CBD and the International Treaty on Plant Genetic Resources for Food and Agriculture (IT) formalised principles of prior informed consent, mutually agreed–terms and benefit–sharing associated with the use and exchange of genetic resources. In 2002, the 187 Parties to the CBD adopted the voluntary *Bonn Guidelines on Access and Benefit–Sharing* ("Bonn Guidelines"). These Guidelines are described below and reproduced in Annex 3.

National governments, including those of the Andean Pact countries, the Philippines, Brazil, and India, have drafted new ABS measures regulating biodiversity research and prospecting. Over fifty governments have implemented or are drafting ABS measures (see Section II below).[20] In addition, countries are beginning to introduce laws regulating access to traditional knowledge, independent of whether it is obtained in conjunction with genetic resources, that complement national ABS measures.[21]

Complementing developments in national and international policy, a range of documents developed by indigenous peoples, researchers, professional research associations and companies have marked a significant shift in the ethical and policy framework for biodiversity research and prospecting partnerships. These documents often pre–dated and influenced the language and approach of national and international ABS law and bioprospecting contracts.[22]

Over the last twenty years, indigenous peoples' organisations have issued a range of declarations and statements with very clear demands in terms of bioprospecting. These include ownership and inalienable rights over their knowledge and resources; requirements for their prior informed consent; right of veto over research and/or access to their land, knowledge or resources, and benefit–sharing. In some cases, these have included calls for a moratorium on bioprospecting until the legal framework is established to allow for equitable partnerships.[23]

Researchers have developed a number of ethics and research guidelines through professional societies like the International Society of Ethnobiology, the American Society of Pharmacognosy, and the Society of Economic Botany. The guidelines lay out general principles for research partnerships, obligations of the partners, and may include recommended guidelines for researchers' behaviour in the field.[24] A range of research institution policies also establish general principles for their employees and associates. Examples include the Principles for Participating Institutions, in which twenty–eight botanic gardens and herbaria from twenty–one countries developed common standards on access to genetic resources and benefit–sharing[25] and the Limbe Botanic and Zoological Gardens Policy on Access to Genetic Resources and Benefit–Sharing in Cameroon.[26]

The activities these documents address are extremely varied, and their scope broad. They include basic academic research as well as commercial prospecting for genetic resources. Research may or may not involve work with local communities. Academic research might be largely field–based, laboratory, or herbarium–based, could be that of a lone student or part of a large well–funded project, and might be in anthropology, botany, chemistry, agricultural breeding or any number of diverse fields.[27] Commercial sectors involved in bioprospecting research range from the pharmaceutical, biotechnology, crop protection, and seed, to horticulture, botanical medicine, food and beverage, and personal care and cosmetic.[28]

4.1 Access and Benefit–Sharing under the Convention on Biological Diversity (CBD)

Coming to grips with this complex and diverse range of policies, interests, claims and uses is daunting and often overwhelming for those with other pressing claims on their time. The Bonn Guidelines and the CBD are the central pieces of international ABS policy with which protected area managers should be familiar. The CBD, which establishes standards for regulating access to genetic resources and the distribution of the benefits arising from biodiversity, is the principle international legal framework concerning the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilization of genetic resources. It is the first international treaty to take a holistic, ecosystem–based approach to the conservation and sustainable use of biological diversity. The CBD is a framework instrument laying down broad goals, key objectives and general principles which are to be implemented by Contracting Parties through measures at the national level on the basis, *inter alia*, of guidance provided by the Conference of the Parties.

The key ABS provisions are contained in Articles 15 to 21.[29] Article 15(1) recognises the sovereign rights of States over their natural resources. As a consequence it also recognises that the authority to determine access to genetic resources rests with the national governments and is subject to national legislation. Article 15 also recognises that each State shall endeavour to facilitate access to genetic resources for environmentally sound uses by other Parties, and it is specified that access shall be provided on mutually

agreed terms. Parties shall moreover endeavour to undertake scientific research based on resources provided by other Parties with their full participation, and Parties shall share benefits with Parties providing the resources.

Pursuant to Article 16, Parties are to provide and/or facilitate access and transfer to developing countries of technologies under 'fair and most favourable terms', and shall co–operate to ensure that intellectual property rights are supportive of the CBD's objectives.[30] Article 19, which addresses the handling of biotechnology and distribution of its benefits, stipulates that measures shall be adopted to provide for the effective participation in biotechnology research by countries providing the genetic resources, and that they be given priority access to results and benefits arising from biotechnology.

Articles 8(j), 10(c), 17(2) and 18(4) require Parties to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities, promote their wider application, with the approval of the relevant communities, and encourage equitable benefit–sharing arising from the use of such knowledge, innovations and practices.

The Bonn Guidelines, adopted in April 2002, provide voluntary guidance for the CBD's Contracting Parties regarding their obligations under the above provisions (reproduced in Annex 3).[31] These Guidelines provide operational guidance for 'users and providers' of genetic resources, to assist governments drafting national laws, and to guide governments, communities, companies, researchers and others involved in ABS agreements.

The Guidelines recognise the need for flexibility of application, that each country is a provider and user of genetic resources, and that the Guidelines may be used in the development of national ABS strategies. Section 2 of the Guidelines lays out the roles and responsibilities in ABS pursuant to Article 15 of the CBD, notably for National Focal Points, Competent National Authorities, Providers and Users. Section 3 considers the participation of stakeholders, and Section 4 identifies steps in the ABS process. Accordingly, access to genetic resources is to be subject to prior informed consent of the Party providing the resources, unless otherwise determined by that Party.[32] Paragraph 27 provides that elements of a prior informed consent system may include identification of the competent authority granting or evidence of prior informed consent, timing and deadlines, specification of use, procedures for obtaining prior informed consent, and mechanisms for consultation of stakeholders.

The Bonn Guidelines also provide guidance on incentives, accountability in implementing ABS arrangements, national monitoring and reporting, means for verification, settlement of disputes, and remedies.[33] Finally, Appendix I outlines suggested elements for Material Transfer Agreements, and Appendix II addresses monetary and non–monetary benefits.

The Bonn Guidelines set out to establish a basic model for ABS, whereby individual users and providers of genetic resources are allowed to come to an informed agreement about how the resources will be used and how the benefits will be shared. There are no minimum standards, although Annex 1 does set the type of elements and issues that one would expect to see in a fair and equitable agreement. The ABS National Focal Point and Competent National Authorities, which are largely envisaged as being governmental departments, provide a central coordination/information exchange in countries.

4.2 Protected Areas and the CBD

The CBD also contains provisions on protected areas.[34] These provisions call upon Parties to establish systems of protected areas, develop guidelines for the selection, establishment and management of protected areas, regulate biological resources important for the conservation of biodiversity and promote environmentally sound development in areas adjacent to protected areas.

The commitments contained in the CBD are intertwined and mutually supportive, the meaning of each separate provision being influenced and influencing the CBD's other provisions. Thus, the three objectives of the Convention as well as the commitments in the other Articles of the Convention provide important dimensions to the scope of the protected areas commitments. For example, the commitments to promote the sustainable use of biological resources are also relevant to Parties' management of protected areas. Similarly, the obligation to support indigenous communities applies to communities within protected areas, which in turn is relevant to Parties' development of protected area policies and management strategies. Importantly in the context of this report, the provisions of the CBD regarding ABS apply to activities in and around the protected area network. In effect this means that in developing their management policies, park managers should take note of the relevant provisions contained both in the CBD and in the Bonn Guidelines.

Collectively, the provisions of the Convention and decisions taken by the Conference of the Parties promote a modern approach to protected area system management? They embody a concept that is not dependent upon setting aside or "locking up" resources found within the protected area network, but one which seeks to promote their integration into the national economy in a sustainable manner and to manage the threats to protected areas in a holistic and integrative manner.

4.3 Implementation of the CBD Access and Benefit–Sharing Provisions

Over fifty Parties have officially reported efforts to develop national legislation or policies to implement the CBD's provisions on the use of genetic resources. Details of these efforts are available from the website of the Secretariat to the CBD.[35] Regional efforts to apply these provisions have been made under the Andean Pact, Association of South East Asian Nations, European Union, African Union, South Pacific Regional Environment Programme and the Pan–European Biological and Landscape Diversity Strategy.

Countries have chosen a variety of mechanisms to introduce ABS measures into their national laws, including new stand–alone laws or additions to existing laws relating to biodiversity or specific sectors such as fisheries, forestry or protected areas.[36] Key lessons that have emerged through this process include the importance of bringing on board a wide range of stakeholders as part of national consultations to develop an ABS measure, including the active involvement of local communities and indigenous peoples; the need for effective implementing institutions and clear and transparent regulatory and permitting processes; the importance of partnerships and non–monetary benefits arising from the research process, since financial benefits in the form of royalties may not materialise; the need to build capacity within the country to address this complex new suite of issues[37]; and the value of collaborating on a regional or international level.[38] ABS National Focal Points and Competent National Authorities play a pivotal role in developing ABS policies, providing information to potential users and providers, and building the know–how and knowledge about biodiversity that allows countries to successfully capture benefits arising from its use.

5 Developing an Access and Benefit–Sharing Policy for Protected Areas: Some Issues to Consider

Protected area ABS policies help protected area managers maximise the potential gains from biodiversity research and prospecting, and minimise lost opportunities and potential negative repercussions from research and commercialisation not undertaken according to current standards of 'best practice'.

Protected area managers and policy makers can best address ABS issues by drafting protected area ABS policies and collaborating on national ABS consultations, strategies and drafting of measures. As a practical first step in dealing with ABS issues, protected area managers should make contact with the relevant ABS National Focal Point and the relevant Competent National Authorities. The Bonn Guidelines provide a practical starting point for all providers and users. As such, protected area managers should familiarise themselves with these Guidelines, copies of which are available on the CBD website in English, Russian, Arabic, French, Spanish and Chinese.

Standardised, yet flexible policies and agreements clarify mutual responsibilities of protected areas and researchers. These include prior informed consent requirements; behaviour in the field; the nature and schedule of benefits to be shared (e.g. training, equipment, provision of research results in locally–relevant forms); and research relationships with local communities living in proximity to protected areas, and whose knowledge and resources are often the subject of research. ABS policies can also require commercial projects to contribute financially to protected area management, or broader national protected area systems in the short, medium and long term. In this way research relationships reflect international standards of best practice as outlined in codes of ethics drafted by professional research societies, research institution policies, indigenous peoples' declarations and statements, and international and national policy and law. At the same time, policies help to ensure that research projects incorporate locally–defined priorities, and that the nature of research collaboration is transparent to the wide range of local stakeholders.

The experience of developing ABS arrangements in protected areas has demonstrated that some of the issues that require special attention for protected areas include the need to make distinctions between academic and commercial research, the role of local communities, the relationship between the protected area and national ABS measures, and the highly politicised and controversial nature of bioprospecting.

5.1 Academic and Commercial Research

Academic and commercial research projects have dramatically different financial and institutional profiles, and serve extremely different objectives. Increasingly, however, the line between the two types of research is blurred. This is because the commercial applications of biodiversity 'information', including genetic resource samples as well as traditional knowledge, have expanded in recent years, and companies often access this information through literature and databases in the public domain. At the same time, non–profit research institutions increasingly supplement declining institutional budgets with funds raised through commercial partnerships, or fund field research through collections for commercial companies. A number of researchers wear two 'hats' while working in the field.

In 1987, for example, collections of the forest liana *Ancistrocladus korupensis* were made in the Korup National Park in Cameroon by researchers working for the non–profit Missouri Botanical Garden and the Centre for the Study of Medicinal Plants in Yaoundé, on behalf of the US National Cancer Institute. The commercial implications of the collections were unknown to park managers and the government at the time, which created considerable confusion when a promising anti–HIV compound, michellamine B, was identified in the sample.[39]

Genetic resource collections are more closely monitored by governments and watchdog groups today, and the need for agreements laying out the terms for commercial collections is widely recognised. However, protected area managers must still clarify their relationships with researchers, including the storage and sharing of samples, and end uses to which they may be put. As a first step, many protected area managers require that all research, whether academic or commercial, be subject to a policy process and in some cases determined by an agreement.

In the Bwindi Impenetrable National Park in Uganda, for example, staff members are working on establishing an accountability system, holding researchers accountable to the park management and the government ministries to ensure that the terms of research proposals and park regulations are strictly observed.[40] In Côte d'Ivoire, the Tai National Park is in the process of developing policies and codes of behaviour to better define the scope and nature of its relationship with researchers through a Scientific Council.[41] In Cameroon, the Waza National Park launched a Scientific Council in 2000 to establish policies and monitor research relationships. In 2002[42], the Korup National Park (KNP) created a Scientific and Technical Committee to examine research priorities, facilitate the signing of agreements, conventions and Memoranda of Understanding (MOUs) between KNP and research institutions, determine the level of research fees to be levied and develop a research strategy for the park. WWF Cameroon, which helps

to manage Waza, Korup and other National Parks, has developed a draft protected area ABS policy to guide research and commercial partnerships.[43]

In these cases, park staff not only monitor research relationships, but set research agendas based on locally–defined needs for conservation and sustainable development. They also develop innovative ways to ensure that even basic research programs proposed outside the area generate benefits for the park. The intention is not to discourage important basic research, but to incorporate into the research process activities that contribute to conserving the resource base in the short–term.

5.2 Local Communities

In the last decade, protected area management and philosophy have increasingly incorporated local communities as important stakeholders. The trend is away from exclusive management models towards inclusive models that involve a high degree of local participation, recognise the links between nature and culture, and employ collaborative approaches that incorporate the traditional resource rights of local communities.[44] In part this is a function of increasing calls for local groups' land and resource rights, and the need for equity and fairness in dealings with indigenous peoples and local communities (e.g. Article 8(j) of the CBD). It also grows from a trend to view biodiversity conservation as incorporating lived–in landscapes, as well as 'no–use' protected areas. As the Ad Hoc Technical Expert Group (AHTEG) put it: protected areas are part of a '...network comprising an ecologically representative and coherent mix of land and/or sea areas that may include protected areas, corridors and buffer zones, and is characterised by interconnectivity with the landscape and existing socio–economic structure and institutions."[45] Protected area managers and policymakers have also come to realise that the involvement of indigenous peoples and local communities is essential to avoiding conflicts and ensuring the long–term sustainability of protected areas.[46]

A number of protected areas have developed co–management agreements with local communities, and in many areas research activities are undertaken with a significant degree of local participation.[47] In the Bwindi Impenetrable National Park (BINP) in Uganda, for example, revenue–sharing and multiple use programmes have helped improve community–park relations and community participation in conservation activities, while enhancing local people's sense of ownership and collective responsibility for the park. BINP staff is also trying to protect local communities' rights to control access to, and benefit from, their traditional ecological knowledge, as part of wider efforts mentioned above to set standards for research relationships.[48] In some cases local communities have initiated protected areas, termed Community–Conserved Areas.[49] For example, seven Quechua communities in Peru have established a "Potato Park", a community–based agro–biodiversity conservation area, modelled along the lines of Category V integrated conservation areas.[50]

In South Africa, creative solutions and opportunities for community co–management and empowerment have emerged from protected areas. In some cases this has been due to the restoration of land to communities who had historic land rights to the area. The Makuleke community in Limpopo Province, for example, has successfully claimed its land in the Kruger National Park and participated in a Joint Management Board for the area.[51] In other cases, new approaches reflect attempts by protected area agencies and the private sector to ensure a flow of benefits to neighbours most directly affected by the Park. The Madikwe Game Reserve, for example, was established with the primary objective of providing an economic engine in an under–developed rural area, and includes a tripartite association between the park authority, private sector, and communities around the park.[52]

In Glacier National Park, which has strong historical and contemporary ties to the Blackfeet, Kootenai and Salish tribes, tribal groups and park researchers developed an MOU for research on indigenous resource management practices. Concerns addressed in the agreement included the type of data to be collected by the US National Park Service, the sensitivity of researchers to its meaning for the tribes, and the release of this information into the public domain. For example, information about sacred sites, vision–questing and the use of plants and minerals for ceremonial purposes was considered highly sensitive. Tribal representatives were also wary because researchers had come through in the past, collecting cultural information, and had provided nothing in return, not even research results.[53]

Protected area policies for researchers should incorporate specific provisions that reflect the rights of communities to be informed, grant consent, and share in the benefits from research. Protected area research policies can make clear to researchers, many of whom will not be familiar with the area or people living there, the ways in which prior informed consent should be sought, appropriate researcher behaviour and the types of benefits that should be shared. Indigenous peoples' statements and declarations, or other documents appropriate to the local situation, might be appended to the research policy to further guide researchers.

5.3 Relationship with National Access and Benefit–Sharing Process and Measures

There are currently 187 Parties to the CBD, roughly 100 of which have begun national consultations, or have drafted measures, to address ABS. The Philippines and the five countries of the Andean Community were the first to introduce ABS measures.[54] ABS in protected areas does not feature prominently in these documents, although genetic resources found in protected areas are considered the property of the state. In both cases, reference is made to the need for research and commercial use to comply with national regulations for protected areas, as well as national ABS measures.

In the case of the 1994 Executive Order 247 in the Philippines, collectors must obtain the prior informed consent of local protected area management boards and '... the Research Agreement entered into must conform with all the requirements under the Republic Act No. 7586 (The National Integrated Protected Areas System Act of 1992), including conformity with the management plan formulated by the Protected Area Management Board' (Appendix B, EO 247).

Although the EO 247 is reported to lead to increased awareness among protected area regulators and local communities about new requirements for more equitable research,[55] it has generally resulted in a decline in academic and commercial research. This is because the Inter–Agency Committee on Biological and Genetic Resources (IACBGR), which reviews and recommends applications for Academic Research Agreements (ARA) and Commercial Research Agreements (CRA), has made very few decisions on agreements. IACBGR members are high–ranking officials from various government departments and organisations, including the Department of Agriculture, the Department of Environment and Natural Resources (DENR), the Department of Science and Technology, the Department of Health, the Department of Foreign Affairs, academic institutions and NGOs, and it has been difficult to convene meetings. Of the twenty applications for ARAs and fifteen applications for CRAs received by the IACBGR Technical Secretariat since the implementation of EO 247 in 1996, only one of each have been granted so far. The University of the Philippines has been granted an ARA, which allows it to issue permits for research involving specimen collection, and the UP–MSI/Utah University has been granted a CRA.[56]

In Decision 391 of the Andean Pact, Ruiz reports that "...little attention was given to specific national regulations for protected areas, including the potential to link existing regulations with the new access regulatory system."[57] In the one clear reference in Decision 391 to protected areas it states: "when access is requested for genetic resources or its derived products from protected areas, the applicant will comply with provisions of Decision 391 and with specific national regulations on the matter."

In Andean Pact countries, Decision 391, combined with national PA legislation, created what Ruiz reported as a complex layer of regulatory obligations in which applicants are not only required to undergo regular access procedures established in Decision 391, but must also comply with the detailed legal framework for protected areas. In practice, however, it is still possible to undertake research through the protected areas legislation and regulations, without going through the Decision 391 process. It also appears that research has either declined, or that it is undertaken outside the Decision 391 process.[58]

The impact of ABS measures on protected areas in Andean Pact countries and the Philippines appears limited. Research in protected areas in both regions is still guided by protected areas legislation and regulations, and often by–passes the new ABS regulatory processes of Decision 391 and EO 247. It also appears that, in cases where ABS measures are not by–passed altogether, they act as deterrents to biodiversity research and prospecting. In order to address these problems, the Philippines 2001 Wildlife Resources and Conservation and Protection Act (RA 9147), no longer considers academic research as bioprospecting for the purposes of permitting agreements. A simpler Memorandum of Agreement between the DENR and researchers now serves to govern academic research. The Philippines' Protected Areas and Wildlife Bureau expects that these more manageable and streamlined procedures will encourage increased scientific research.[59]

In Costa Rica, the 1998 Biodiversity Law also requires prior informed consent of 'the regional councils of the Conserved Areas' for biodiversity research and prospecting. This grew out of the consultation process leading up to the law and discussion of the relationship between protected areas, conservation, and research.[60]

In South Africa, a more ambiguous situation persists despite the extensive and well–regarded protected area system in place. The country's lack of ABS measures and guidance has led to conservation agencies being at different stages of ABS policy development, with uneven understanding and capacity. With no less than 13 bodies responsible for protected area management in the nine provinces of the country, and continuing absence of national ABS legislation, confusion surrounds the ways in which ABS might be implemented in protected areas. The result is a mix of approaches, ranging from outright refusal to allow bioprospecting, through to *ad hoc* partnerships that do not always deliver

optimal benefits. The South African National Parks has developed a specific policy on bioprospecting as part of its broader policy on resource use (Box 1) and plans to develop a set of protocols and procedures to implement this policy. A specific ABS policy has also been developed by Ezemvelo KwaZulu–Natal Wildlife, placing a special focus on the need to monitor and regulate bioprospecting activities within protected areas in the province (Box 2; see Annex 2).

In countries with well–developed ABS measures like the Philippines, Costa Rica, and those of the Andean Pact, as well as those still in a state of flux like South Africa and Cameroon, protected area managers are called upon to take an active role in managing biodiversity research and prospecting partnerships. In the former cases, responsibility is explicitly transferred in part to the protected area managers, in conjunction with national regulatory bodies. In the latter cases, absence of national guidance has left protected area managers as *de facto* 'gatekeepers' of national genetic resources. Protected areas managers are an important part of the evolving international and national ABS policy framework, and increasingly assume these new responsibilities as part of their day to day operations.

Protected area managers should play an important role in national consultative processes that address ABS issues and that develop national measures to implement the CBD. Such managers can contribute valuable perspectives on effective in–situ conservation, and can provide insight into some of the practical ramifications of approaches to ABS regulation. However, effective participation in this process requires capacity and understanding of the elements of equitable research relationships, and international standards of 'best practice' for researchers and

BOX 2 Policy of Ezemvelo KZN Wildlife on Bioprospecting

Bioprospecting

POLICY FILE NO: new
DATE OF BOARD APPROVAL: 1 December 2000
BOARD MINUTE: The KwaZulu–Natal Nature Conservation Service, being AWARE that:

- "bioprospecting" is defined as the exploration of biodiversity for commercially valuable genetic and biochemical resources;
- animals, plants and other elements of biodiversity may contain valuable compounds for all of humankind;
- potential economic and scientific benefits of bioprospecting to the country, the province and communities are substantial;
- biodiversity conservation can and should benefit from bioprospecting economically and through addition of knowledge;
- benefits of bioprospecting must accrue to the country or people of origin;
- protected areas are often sites targeted for research which seeks novel compounds or species for horticultural development;
- all forms of wildlife resource use must be sustainable and pose no threat to biodiversity;

RECOGNISING that:

- Traditional communities have the right to control their land and resources and to secure benefit from recording and use of their knowledge;
- all research should contribute to conservation and development in areas in which it takes place;

REALISING that:

- no current national or provincial legislation and policy exists on bioprospecting although South Africa ratified the Convention on Biodiversity in 1995;
- organisational policy must reflect national policy when it is implemented;

and being DETERMINED to honour the letter and spirit of the Convention on Biodiversity, the Convention on Trade in Endangered Species (CITES) and national and provincial laws concerning biodiversity and its use;

UNDERTAKES to:

1. consider requests from only South African *bone fide* research institutions to collect biological material samples from protected areas until national and provincial legislation governing bioprospecting is in place;
2. ensure that any authorised biological material collection is done in terms of an agreement on the collection of such material (Appendix 1);
3. monitor and regulate bioprospecting activities within KwaZulu–Natal and especially in protected areas in terms of current Nature Conservation legislation;
4. build capacity within the Nature Conservation Service relating to commercialisation of biological resources, including bioprospecting;
5. contribute to ensuring that equitable benefit from bioprospecting accrues to the information or material source;
6. assist traditional communities and national research institutions in the development of sustainable sourcing strategies for species of commercial interest;
7. ensure that any approved collection of biological material is done in a sustainable manner.

commercial use of biodiversity. Ongoing capacity development is a necessary precursor to, and by–product of, a protected–area policy consultation and drafting process.

ABS measures nationalise genetic resources, making them the property of the state. Although genetic resource collection is site–specific, most species are not. An additional issue to be resolved at the national, as well as at the protected–area level, is the status of genetic resources depending upon the location of collections. For example, if species are collected in transboundary protected areas, what agreement is reached for benefit–sharing between governments involved? Private lands under conservation management, community–conserved areas, as well as publicly–managed protected areas raise distinct questions relating to prior informed consent and terms for ABS. In the absence of strong national ABS measures, a great deal of ambiguity remains, which protected area ABS policies might need to address in an interim manner.

5.4 The Politicised and Contentious Nature of Access and Benefit–Sharing

Protected area policymakers and managers face a complex range of issues when confronted with the implications of biodiversity research and bioprospecting today. The role of basic research in conservation and development, the commercial use of biodiversity, relationships between users of genetic resources and protected areas with local communities and indigenous peoples, and the objectives and philosophy of protected area management are undergoing change. Although most bioprospecting results in minimal harm to resources, the concept of 'use' of park resources lies far outside the traditional paradigm of park management. At the same time, commercialisation of genetic resources is a politically–charged field through which a wide range of concerns are expressed, including indigenous peoples' control of their knowledge and resources, public control over biotechnology, the patenting of life forms, and the relationship between multi–national companies and local groups. Stepping into this area of policy requires a firm grip of current dialogue on the suite of issues stirred by globalisation.

As illustrated in the case of Yellowstone and Diversa, even the best intentions, in this case to ensure that the park would benefit from future commercial product collections, can backfire. A substantial effort of public consultation and transparency at each step in the process is necessary in order to ensure that new frameworks for research and commercialisation reflect current standards of best practice and fit with locally–defined priorities for protected areas.

6 Recommendations

Protected area managers and policy makers can best address ABS issues by drafting protected area ABS policies and collaborating on national ABS consultations, strategies and drafting of measures. In order to do this, administrative and institutional capacity must be built within protected areas, and support provided by national and international policymakers.

Recommendations to achieve this include:

- As a practical first step in dealing with ABS issues the protected area managers should make contact with the relevant ABS National Focal Point and the relevant Competent National Authorities for the Convention on Biological Diversity.

- The Bonn Guidelines (see Annex 3) provide a practical starting point for all providers and users. As such, protected area managers should familiarise themselves with these Guidelines, copies of which are available on the CBD website in English, Russian, Arabic, French, Spanish and Chinese.

- Protected area managers should consider developing an ABS policy for their protected areas. The national policy framework and the Bonn Guidelines provide useful guidance for such policies. Experience has shown that particular attention needs to be paid to:
  - distinctions between academic and commercial research;
  - the role of local communities;
  - the relationship between the protected area and national ABS measures; and
  - the highly politicised and controversial nature of bioprospecting.

- Developing endogenous capacities is the single most important step to capturing a greater share of the benefits. Know–how needs to be built within protected area and government staff relating to equitable research relationships and ABS issues under the CBD. An investment needs to be made in an ongoing process of capacity development, and policy and institutional review and development, in order to educate, empower and mobilise protected area managers (e.g. document UNEP/CBD/AHTEG–PA/1/3, p. 56) to better capture benefits for protected areas from biodiversity research and prospecting.

- New or expanded protected area institutional structures need to be established to address these issues. For example, a multi–stakeholder scientific council, or comparable body, can set research priorities, draft and implement research policies, monitor research relationships and oversee sharing of benefits. The composition of this body might include protected area managers, representatives from government ministries, active institutional collaborators and researchers, local communities, and NGOs.

- Protected area managers should participate in national ABS consultations, joining stakeholder committees set up to consider ABS issues.

- Protected area managers should actively seek the return of benefits to sites from which collections were made, including building partnerships involving intermediate benefits like training, equipment, and research results. Protected areas, as the sites of original collections, should also be explicitly represented as beneficiaries in any ABS commercial agreements.

- Protected area managers should include ABS issues in negotiations and management plans developed for transboundary conservation areas. Community conservation areas, private protected areas, and others should also integrate ABS issues into their management plans.

- Protected area managers should ensure openness and transparency with stakeholders when considering access applications from companies and academic researchers.

- National permitting procedures for research in protected areas should be streamlined to ensure it is efficient and transparent, and integrates the range of relevant governmental regulations (e.g. ABS, Protected Area), protected area and local community requirements and regulations. This will help to ensure that ABS procedures are more effectively implemented, and not side–lined altogether.

- Mechanisms should be established to manage any financial benefits resulting from bioprospecting (e.g. conservation trust funds).

- ABS issues should be incorporated into NBSAPS and other protected area policies, and also into the management plans of individual parks.

- Capacities within local and indigenous communities should be developed to promote their ability to participate in ABS strategies and to develop ABS arrangements.

Annex 1
Yellowstone National Park and the Diversa Corporation Agreement for Biodiversity Prospecting

In 1997, the United States Park Service entered into an agreement with the Diversa Corporation for bioprospecting in Yellowstone National Park (YNP). The partnership was shaped by the discovery in 1966 of the thermophile *Thermus aquaticus*, which yielded the enzyme taq polymerase. Taq polymerase is used in a wide range of biotechnological applications with annual sales of more than US$200 million. Because YNP received no direct benefits from these collections, YNP managers decided that future research agreements must provide for benefit–sharing with the park (ten Kate et al, 2002; Madigan and Marrs, 1997; Wolf, 1994).

The agreement between YNP and Diversa, called a Cooperative Research and Development Agreement (CRADA), provides Diversa with non–exclusive access to microbial genetic resources in the park, assistance from Park scientists and provision of Park data. In return, Diversa agreed to pay YNP an upfront fee of US$100,000 in five annual instalments, offset by any potential receipt of royalties derived from net sales of commercialised products. Royalty rates varied depending on the nature of the final commercial product, ranging between 0.5 per cent of net sales of industrial or pharmaceutical products to 10 per cent of net revenues realised by Diversa from the licensing, assignment or sale of copyright work such as books, journals, articles or genetic codes. Should any product generate net sales of between $50–200 million, YNP will receive a royalty of more than 10 per cent. Non–monetary benefits provided by Diversa to the YNP were agreed to total $75,000 per year, and include provision of equipment and training in the latest molecular biology techniques for park projects (ten Kate et al, 2002; Smith, 1999; Seedling, 1999).

While YNP will retain all up front annual payments from Diversa, pursuant to the law governing CRADAs, YNP must share royalties received from Diversa with the National Park Service, thus providing for benefit–sharing with Yellowstone's sister parks (Paragraph (a)(1)(B), 15 USC 3710c 'Distribution of Royalties Received by Federal Agencies'; available at <http://www.dtic.mil/techtransit/refroom/laws/15usc3710c.html>).

Controversy Surrounding the Agreement

The YNP–Diversa agreement met with opposition from a number of NGOs. Their main concerns centred around: the failure to disclose the terms of the CRADA; requests that the National Park Service (NPS) perform an environmental impact study and provide the public with notice of the proposed change in policy prior to entering into the CRADA; the statutory authority of the NPS to enter into such an agreement; and the conformity of bioprospecting with the NPS purpose of conservation

In July 1997, the Edmonds Institute filed Freedom of Information Act requests with the Office of the Secretary of the Interior and with the National Park Service to gain access to the CRADA. On 15 August 1997, the Edmonds Institute and the International Center for Technology Assessment filed a petition with the Secretary of the Interior and with the National Parks Service, requesting the proposed CRADA be dropped and information concerning the agreement be made publicly available. Despite these requests and petitions, the CRADA was signed on 17 August 1997 at the commemoration of the YNP's 125th anniversary.

In January 1998, the NPS Director rejected the petition to drop the YNP–Diversa Agreement, and in February 1998 the Department of Interior settled the Freedom of Information Act lawsuit out of court, paying the Edmonds Institute USD 8,000 in legal fees and disclosing most of the CRADA's terms. The Department did not, however, disclose Appendix B of the CRADA, containing the agreement's financial details. In response, the Edmonds Institute filed a further Freedom of Information Act lawsuit for not disclosing Appendix B (ten Kate et al, 2002).

In March 1998, the Edmonds Institute, the International Center for Technology Assessment, the Alliance for the Wild Rockies and Phil Knights, filed a complaint against the Department of the Interior and the NPS to stop implementing the CRADA. The complaint questioned the authority of the NPS to enter into such an agreement, the conformity of the CRADA with the National Park Service's purposes, and its conformity with the National Environmental Policy Act, according to which CRADAs have to be "subjected to the public scrutiny to analyse its environmental or socioeconomic impacts" (ten Kate et al, 2002).

In April 2000, the District Court for the District of Columbia ruled that the NPS was required to complete an environmental assessment under the National Environmental Policy Act (Wood, 2003), thus suspending the CRADA until completion of the assessment (YNP 2003, 135). It further decided that the NPS does have the authority to enter into such an agreement and that the CRADA does not violate the Yellowstone National Park Organic Act nor the National Park Service Organic Act (Wood, 2003), both of which require the NPS to maintain the Park environment "unspoiled and prohibit the sale or commercial use of natural products from the national parks".

Impact of Controversy on Agreement and Wider YNP Policy

As a result of concerns voiced in the first few years of the negotiation and agreement, elements of the benefit–sharing package were expanded. These include raising the non–monetary benefits (equipment and training) from the original value of US$75,000 during the 5–year duration of the CRADA, to a value of this sum each year. Royalty rates were also raised in the event that product sales reached in the range of US$ 50 – $200 million (ten Kate et al, 2002). An environmental impact statement is currently underway to ensure the proposed bioprospecting does not damage park resources. The agreement remains suspended pending the environmental impact study with public input.

The YNP conducted what they considered sufficient public consultations regarding the agreement, including the September 1995 "Old Faithful Symposium", where it announced its intention to solicit feedback from the public and affected parties. Park staff estimate they shared information with the public on its partnership policy with companies "at well over 100 venues, through meetings, television programmes and newspaper articles" (ten Kate et al, 2002). However, watchdog groups remained concerned that the public consultation was not sufficient, the details of the agreement remained confidential, and the potential environmental impacts of collections were not known (Smith, 1999).

This case amply demonstrates the difficulties that park managers face under changing paradigms of both commercial use of biodiversity and protected area management. 'Use' of park resources lies far outside the traditional paradigm of park management, however most first–round bioprospecting collections involve minimal or no damage to species (Chester, 1999). Yellowstone park managers were seeking to gain from new forms of commercial research, and to employ new models of protected area management that link sustainable use and conservation. However, wider consultation and greater transparency will be necessary in order to ensure a level of comfort with the rapidly evolving role of protected areas, and the increasingly politicised nature of genetic resource commercialisation (Laird and Lisinge, 2002).

Annex 2
South African Experiences of Access and Benefit–Sharing in Protected Areas

Rachel Wynberg

South Africa has an extremely well–developed system of protected areas, first established in the late nineteenth century, and currently undergoing an unprecedented expansion. More than 400 formally protected areas constitute about 6 per cent of the land surface, and nearly 5 per cent of the country's coastline (DEAT, 2001). Although these do not form part of a rational and systematic plan, and do not adequately represent biodiversity patterns and processes, they nonetheless include a high proportion of South Africa's biodiversity (Wynberg, 2002).

South Africa's engagement in bioprospecting is also well developed. Not only is the country exceptionally rich in biodiversity, but its levels of endemism are also extremely high. These attributes, combined with the country's advanced institutional and research capacity, provide an extremely favourable environment for bioprospecting (Laird and Wynberg, 1997). The launch of a major bioprospecting initiative by the CSIR, a South African parastatal organisation, has given further impetus to the commercialisation of indigenous biological resources.

Many international and national companies and research institutions are engaged in utilizing South African genetic resources for commercial purposes, and protected areas are often the sites in which collections occur. In theory, the benefits realised from such activities should assist conservation activities in protected areas, especially in the face of dwindling government funding for biodiversity management. But to what extent are these opportunities realised, and how well integrated are the respective policy frameworks for protected area management and access and benefit–sharing (ABS)?

At the national level, ABS legislation has been long in the making. Although a broad national ABS policy was adopted in 1997 as part of the Biodiversity White Paper (DEAT, 1997), this has proved insufficient to guide ABS activities and agreements. Opportunities and benefits that could arise from use of the country's rich and unique biodiversity have been significantly curtailed by the absence of legal and administrative mechanisms (Wynberg, 2003), a deficiency well recognised and presently the focus of new legislation being drafted as part of a National Biodiversity Act.

Serious problems attend ABS provisions of the draft legislation, among them its overly bureaucratic requirements, its exclusion of stakeholder participation, and its failure to provide clarity as to the permitting and procedural arrangements for ABS, including the role of provincial authorities (Wynberg and Burgener, 2003). In addition to these concerns, there are also no linkages between ABS, conservation, and the management of protected areas. New national legislation for protected areas is being developed in parallel to the Biodiversity Act, but this too omits any reference to ABS.

A lack of integration is also evident within the thirteen different provincial and national agencies responsible for protected area management in South Africa, and an extremely diverse set of approaches to ABS has evolved amongst these bodies. In the Western Cape Province, for example, a moratorium currently exists on bioprospecting, both within and outside of protected areas, although permits have historically been given for collections to take place. In the Northern Cape Province, a prohibition on destructive collecting within protected areas effectively precludes any biological collections from taking place, whether for commercial purposes or not. Within National Parks, proposals are generally assessed on an *ad hoc* basis, and may be referred to expert groups for opinion. In Gauteng Province, ABS applications are turned down because of a lack of administrative capacity within the department, and insufficient support from national government. Often, uneven understanding and capacity within different conservation agencies lead to inconsistent responses to the same bioprospecting application (Wynberg, 2003). Difficulties faced in distinguishing between applications for academic and commercial research further complicate and confuse the situation, although officials are often familiar with applicants and the nature of the research being conducted, making this distinction less fuzzy.

Different agencies are also at different stages of policy development on the matter, reflecting to a large extent the virtually absent role played by national government in providing policy guidance and advice on ABS, and also extreme fragmentation amongst conservation bodies in the country: thirteen different agencies control over 400 protected areas, which fall under eleven national and nine provincial laws (DEAT, 2001). As noted above, the South African National Parks and Ezemvelo KwaZulu–Natal Wildlife have drafted bioprospecting policies (Boxes 1 and 2). Most of the nine provinces, however, rely on an interim ABS policy and an MOU, developed jointly through a working group on the matter. The MOU, designed for the collection of biological material for research, prohibits use of the material for commercial purposes and prevents its transfer to third parties. If commercialisation is intended, the applicant is required to develop a separate agreement with the provider of biological material. Neither the policy nor the MOU deal explicitly with the collection of

material *in* protected areas, but instead cover broadly all biological resources under the jurisdiction of the province. In most cases, this includes state land both within and outside of protected areas.

For most protected area agencies in South Africa, ABS issues fall low on the priority list, and a reduction in applications for bioprospecting has also reduced the urgency with which protected area agencies view the matter. Resources allocated for conservation have declined across the board, and frustration and disillusionment have caused a mass exodus of highly trained managers and scientists from conservation departments. Capacity constraints dictate that management is often based on reactive responses, rather than through the proactive planning required to develop ABS policies and procedures. Nature conservation agencies lack the capacity to deliver on *existing* policies, let alone to develop and implement *new* policies on issue such as ABS that may not appear to be an immediate priority. Having said this, it is interesting to note that in the absence of national oversight, many conservation agencies have built up expertise and capacity rapidly to deal with ABS issues, often through self–initiative.

The continued financing of protected areas is a key issue, given steadily declining state funding for conservation, and subsequent pressures to commercialise protected areas so conservation can 'pay its way'. Although bioprospecting is considered a potential mechanism to bring financial and other benefits to protected areas, many agencies are wary of the administrative burdens it brings, and of the difficulties within government of earmarking funding for specific protected areas or conservation projects. The proposed Biodiversity Act provides for a Bioprospecting Fund, but this too has raised concerns because of its centralised nature, and likely tendency to have high transaction costs.

What is the way forward? Certainly there is scope to better integrate ABS and protected areas and to build ABS management capacity among protected area agencies. Such efforts, however, also need to extend more broadly to other national and provincial government bodies, to research institutions and to the community level. Clear, simple, streamlined and standardised administrative procedures are a prerequisite, requiring strong coordination mechanisms to be developed with and between protected area agencies, including the establishment of a central database. The development of a standardised process for permit applications is an essential part of this process. Bioprospecting clearly forms only one of a range of activities that can be pursued by protected area agencies wishing to exploit strategies to sustain reserves. Tailoring efforts towards specific needs, and tempering costs against the benefits which bioprospecting can realistically deliver remains the most crucial exercise of all.

Annex 3
Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization

I General Provisions

A Key Features

1. These Guidelines may serve as inputs when developing and drafting legislative, administrative or policy measures on access and benefit–sharing with particular reference to provisions under Articles 8(j), 10 (c), 15, 16 and 19; and contracts and other arrangements under mutually agreed terms for access and benefit–sharing.
2. Nothing in these Guidelines shall be construed as changing the rights and obligations of Parties under the Convention on Biological Diversity.
3. Nothing in these Guidelines is intended to substitute for relevant national legislation.
4. Nothing in these Guidelines should be interpreted to affect the sovereign rights of States over their natural resources;
5. Nothing in these Guidelines, including the use of terms such as "provider", "user", and "stakeholder", should be interpreted to assign any rights over genetic resources beyond those provided in accordance with the Convention;
6. Nothing in these Guidelines should be interpreted as affecting the rights and obligations relating to genetic resources arising out of the mutually agreed terms under which the resources were obtained from the country of origin.
7. The present Guidelines are voluntary and were prepared with a view to ensuring their:
   a. Voluntary nature: they are intended to guide both users and providers of genetic resources on a voluntary basis;
   b. Ease of use: to maximize their utility and to accommodate a range of applications, the Guidelines are simple;
   c. Practicality: the elements contained in the guidelines are practical and are aimed at reducing transaction costs;
   d. Acceptability: the Guidelines are intended to gain the support of users and providers;
   e. Complementarity: the Guidelines and other international instruments are mutually supportive;
   f. Evolutionary approach: the Guidelines are intended to be reviewed and accordingly revised and improved as experience is gained in access and benefit–sharing;
   g. Flexibility: to be useful across a range of sectors, users and national circumstances and jurisdictions, guidelines should be flexible;
   h. Transparency: they are intended to promote transparency in the negotiation and implementation of access and benefit–sharing arrangements.

B Use of Terms

8. The terms as defined in Article 2 of the Convention shall apply to these Guidelines. These include: biological diversity, biological resources, biotechnology, country of origin of genetic resources, country providing genetic resources, *ex situ* conservation, in situ conservation, genetic material, genetic resources, and in situ conditions.

C Scope

9. All genetic resources and associated traditional knowledge, innovations and practices covered by the Convention on Biological Diversity and benefits arising from the commercial and other utilization of such resources should be covered by the guidelines, with the exclusion of human genetic resources.

D Relationship with Relevant International Regimes

10. The guidelines should be applied in a manner that is coherent and mutually supportive of the work of relevant international agreements and institutions. The guidelines are without prejudice to the access and benefit–sharing provisions of the FAO International Treaty for Plant Genetic Resources for Food and Agriculture. Furthermore, the work of the World Intellectual Property Organization (WIPO) on issues of relevance to access and benefit–sharing should be taken into account. The application of the guidelines should also take into account existing regional legislation and agreements on access and benefit–sharing.

E 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 cooperation 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.

II Roles and Responsibilities in Access and Benefit–Sharing Pursuant to Article 15 of the Convention on Biological Diversity

A National Focal Point

13. Each Party should designate one national focal point for access and benefit–sharing and make such information available through the clearing–house mechanism. The national focal point should inform applicants for access to genetic resources on procedures for acquiring prior informed consent and mutually agreed terms, including benefit–sharing, and on competent national authorities, relevant indigenous and local communities and relevant stakeholders, through the clearing–house mechanism.

B Competent National Authority(ies)

14. Competent national authorities, where they are established, may, in accordance with applicable national legislative, administrative or policy measures, be responsible for granting access and be responsible for advising on:

a. The negotiating process;

b. Requirements for obtaining prior informed consent and entering into mutually agreed terms;

c. Monitoring and evaluation of access and benefit–sharing agreements;

d. Implementation/enforcement of access and benefit–sharing agreements;

e. Processing of applications and approval of agreements;

f. The conservation and sustainable use of the genetic resources accessed;

g. Mechanisms for the effective participation of different stakeholders, as appropriate for the different steps in the process of access and benefit–sharing, in particular, indigenous and local communities;

h. Mechanisms for the effective participation of indigenous and local communities while promoting the objective of having decisions and processes available in a language understandable to relevant indigenous and local communities.

15. The competent national authority(ies) that have the legal power to grant prior informed consent may delegate this power to other entities, as appropriate.

C Responsibilities

16. Recognizing that Parties and stakeholders may be both users and providers, the following balanced list of roles and responsibilities provides key elements to be acted upon:
    a. Contracting Parties which are countries of origin of genetic resources, or other Parties which have acquired the genetic resources in accordance with the Convention, should:
        i. Be encouraged to review their policy, administrative and legislative measures to ensure they are fully complying with Article 15 of the Convention;
        ii. Be encouraged to report on access applica-tions through the clearing–house mechanism and other reporting channels of the Convention;
        iii. Seek to ensure that the commercialization and any other use of genetic resources should not prevent traditional use of genetic resources;
        iv. Ensure that they fulfill their roles and responsibilities in a clear, objective and transparent manner;
        v. Ensure that all stakeholders take into consideration the environmental consequences of the access activities;
        vi. Establish mechanisms to ensure that their decisions are made available to relevant indigenous and local communities and relevant stakeholders, particularly indigenous and local communities;
        vii. Support measures, as appropriate, to enhance indigenous and local communities' capacity to represent their interests fully at negotiations;
    b. In the implementation of mutually agreed terms, users should:
        i. Seek informed consent prior to access to genetic resources, in conformity with Article 15, paragraph 5, of the Convention;
        ii. Respect customs, traditions, values and customary practices of indigenous and local communities,
        iii. Respond to requests for information from indigenous and local communities;
        iv. Only use genetic resources for purposes consistent with the terms and conditions under which they were acquired;
        v. Ensure that uses of genetic resources for purposes other than those for which they were acquired, only take place after new prior informed consent and mutually agreed terms are given;
        vi. Maintain all relevant data regarding the genetic resources, especially documentary evidence of the prior informed consent and information concerning the origin and the use of genetic resources and the benefits arising from such use;
        vii. As much as possible endeavor to carry out their use of the genetic resources in, and with the participation of, the providing country;
        viii. When supplying genetic resources to third parties, honor any terms and conditions regarding the acquired material. They should provide this third party with relevant data on their acquisition, including prior informed consent and conditions of use and record and maintain data on their supply to third parties. Special terms and conditions should be established under mutually agreed terms to facilitate taxonomic research for non–commercial purposes;
        ix. Ensure the fair and equitable sharing of benefits, including technology transfer to providing countries, pursuant to Article 16 of the Convention arising from the commercialization or other use of genetic resources, in conformity with the mutually agreed terms they established with the indigenous and local communities or stakeholders involved;
    c. Providers should:
        i. Only supply genetic resources and/or traditional knowledge when they are entitled to do so;
        ii. Strive to avoid imposition of arbitrary restrictions on access to genetic resources.
    d. Contracting Parties with users of genetic resources under their jurisdiction should take appropriate legal, administrative, or policy measures, as appropriate, to support compliance with prior informed consent of the Contracting Party providing such resources and mutually agreed terms on which access was granted. These countries could consider, *inter alia*, the following measures:
        i. Mechanisms to provide information to potential users on their obligations regarding access to genetic resources;
        ii. Measures to encourage the disclosure of the country of origin of the genetic resources and of the origin of traditional knowledge, innovations and practices of indigenous and local communities in applications for intellectual property rights;
        iii. Measures aimed at preventing the use of genetic resources obtained without the prior informed consent of the Contracting Party providing such resources;
        iv. Cooperation between Contracting Parties to address alleged infringements of access and benefit–sharing agreements;
        v. Voluntary certification schemes for institutions abiding by rules on access and benefit–sharing;
        vi. Measures discouraging unfair trade practices;

vii. Other measures that encourage users to comply with provisions under subparagraph ?16 (b) above.

III Participation of Stakeholders

17. Involvement of relevant stakeholders is essential to ensure the adequate development and implementation of access and benefit–sharing arrangements. However, due to the diversity of stakeholders and their diverging interests, their appropriate involvement can only be determined on a case–by–case basis.
18. Relevant stakeholders should be consulted and their views taken into consideration in each step of the process, including:
    a. When determining access, negotiating and implementing mutually agreed terms, and in the sharing of benefits;
    b. In the development of a national strategy, policies or regimes on access and benefit–sharing.
19. To facilitate the involvement of relevant stakeholders, including indigenous and local communities, appropriate consultative arrangements, such as national consultative committees, comprising relevant stakeholder representatives, should be made.
20. The involvement of relevant stakeholders should be promoted by:
    a. Providing information, especially regarding scientific and legal advice, in order for them to be able to participate effectively;
    b. Providing support for capacity–building, in order for them to be actively engaged in various stages of access and benefit–sharing arrangements, such as in the development and implementation of mutually agreed terms and contractual arrangements.
21. The stakeholders involved in access to genetic resources and benefit–sharing may wish to seek the support of a mediator or facilitator when negotiating mutually agreed terms.

IV Steps in the Access and Benefit–Sharing Process

A Overall Strategy

22. Access and benefit–sharing systems should be based on an overall access and benefit–sharing strategy at the country or regional level. This access and benefit–sharing strategy should aim at the conservation and sustainable use of biological diversity, and may be part of a national biodiversity strategy and action plan and promote the equitable sharing of benefits.

B Identification of Steps

23. The steps involved in the process of obtaining access to genetic resources and sharing of benefits may include activities prior to access, research and development conducted on the genetic resources, as well as their commercialization and other uses, including benefit–sharing.

C Prior Informed Consent

24. As provided for in Article 15 of the Convention on Biological Diversity, which recognizes the sovereign rights of States over their natural resources, each Contracting Party to the Convention shall endeavor to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and fair and equitable sharing of benefits arising from such uses. In accordance with Article 15, paragraph 5, of the Convention on Biological Diversity, access to genetic resources shall be subject to prior informed consent of the contracting Party providing such resources, unless otherwise determined by that Party.
25. Against this background, the Guidelines are intended to assist Parties in the establishment of a system of prior informed consent, in accordance with Article 15, paragraph 5, of the Convention.

1 Basic Principles of a Prior Informed Consent System

26. The basic principles of a prior informed consent system should include:
    a. Legal certainty and clarity;
    b. Access to genetic resources should be facilitated at minimum cost;
    c. Restrictions on access to genetic resources should be transparent, based on legal grounds, and not run counter to the objectives of the Convention;
    d. Consent of the relevant competent national authority(ies) in the provider country. The consent of relevant stakeholders, such as indigenous and local communities, as appropriate to the circumstances and subject to domestic law, should also be obtained.

2 Elements of a Prior Informed Consent System

27. Elements of a prior informed consent system may include:
    a. Competent authority(ies) granting or providing for evidence of prior informed consent;
    b. Timing and deadlines;
    c. Specification of use;
    d. Procedures for obtaining prior informed consent;
    e. Mechanism for consultation of relevant stakeholders;
    f. Process.

Competent Authority(ies) Granting Prior Informed Consent

28. Prior informed consent for access to *in situ* genetic resources shall be obtained from the Contracting Party providing such resources, through its competent national authority(ies), unless otherwise determined by that Party.
29. In accordance with national legislation, prior informed consent may be required from different levels of Government. Requirements for obtaining prior informed consent (national/provincial/local) in the provider country should therefore be specified.
30. National procedures should facilitate the involvement of all relevant stakeholders from the community to the government level, aiming at simplicity and clarity.
31. Respecting established legal rights of indigenous and local communities associated with the genetic resources being accessed or where traditional knowledge associated with these genetic resources is being accessed, the prior informed consent of indigenous and local communities and the approval and involvement of the holders of traditional knowledge, innovations and practices should be obtained, in accordance with their traditional practices, national access policies and subject to domestic laws.
32. For *ex situ* collections, prior informed consent should be obtained from the competent national authority(ies) and/or the body governing the *ex situ* collection concerned as appropriate.

Timing and Deadlines

33. Prior informed consent is to be sought adequately in advance to be meaningful both for those seeking and for those granting access. Decisions on applications for access to genetic resources should also be taken within a reasonable period of time.

Specification of Use

34. Prior informed consent should be based on the specific uses for which consent has been granted. While prior informed consent may be granted initially for specific use(s), any change of use including transfer to third parties may require a new application for prior informed consent. Permitted uses should be clearly stipulated and further prior informed consent for changes or unforeseen uses should be required. Specific needs of taxonomic and systematic research as specified by the Global Taxonomy Initiative should be taken into consideration.
35. Prior informed consent is linked to the requirement of mutually agreed terms.

Procedures for Obtaining Prior Informed Consent

36. An application for access could require the following information to be provided, in order for the competent authority to determine whether or not access to a genetic resource should be granted. This list is indicative and should be adapted to national circumstances:
    a. Legal entity and affiliation of the applicant and/or collector and contact person when the applicant is an institution;
    b. Type and quantity of genetic resources to which access is sought;
    c. Starting date and duration of the activity;
    d. Geographical prospecting area;
    e. Evaluation of how the access activity may impact on conservation and sustainable use of biodiversity, to determine the relative costs and benefits of granting access;
    f. Accurate information regarding intended use (e.g.: taxonomy, collection, research, commercialization);
    g. Identification of where the research and development will take place;
    h. Information on how the research and development is to be carried out;
    i. Identification of local bodies for collaboration in research and development;
    j. Possible third party involvement;
    k. Purpose of the collection, research and expected results;
    l. Kinds/types of benefits that could come from obtaining access to the resource, including benefits from derivatives and products arising from the commercial and other utilization of the genetic resource;
    m. Indication of benefit–sharing arrangements;
    n. Budget;
    o. Treatment of confidential information.
37. Permission to access genetic resources does not necessarily imply permission to use associated knowledge and vice versa.

Process

38. Applications for access to genetic resources through prior informed consent and decisions by the competent authority(ies) to grant access to genetic resources or not shall be documented in written form.
39. The competent authority could grant access by issuing a permit or licence or following other appropriate procedures. A national registration system could be used to record the issuance of all permits or licences, on the basis of duly completed application forms.
40. The procedures for obtaining an access permit/licence should be transparent and accessible by any interested party.

D Mutually Agreed Terms

41. In accordance with Article 15, paragraph 7, of the Convention on Biological Diversity, 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". Thus, guidelines should assist Parties and stakeholders in the development of mutually agreed terms to ensure the fair and equitable sharing of benefits.

1 Basic Requirements for Mutually Agreed Terms

42. The following principles or basic requirements could be considered for the development of mutually agreed terms:
    a. Legal certainty and clarity;
    b. Minimization of transaction costs, by, for example:
        i. Establishing and promoting awareness of the Government's and relevant stakeholders' requirements for prior informed consent and contractual arrangements;
        ii. Ensuring awareness of existing mechanisms for applying for access, entering into arrangements and ensuring the sharing of benefits;
        iii. Developing framework agreements, under which repeat access under expedited arrangements can be made;
        iv. Developing standardized material transfer agreements and benefit–sharing arrangements for similar resources and similar uses (see appendix I for suggested elements of such an agreement);
    c. Inclusion of provisions on user and provider obligations;
    d. Development of different contractual arrangements for different resources and for different uses and development of model agreements;
    e. Different uses may include, *inter alia*, taxonomy, collection, research, commercialization;
    f. Mutually agreed terms should be negotiated efficiently and within a reasonable period of time;
    g. Mutually agreed terms should be set out in a written agreement.
43. The following elements could be considered as guiding parameters in contractual agreements. These elements could also be considered as basic requirements for mutually agreed terms:
    a. Regulating the use of resources in order to take into account ethical concerns of the particular Parties and stakeholders, in particular indigenous and local communities concerned;
    b. Making provision to ensure the continued customary use of genetic resources and related knowledge;
    c. Provision for the use of intellectual property rights include joint research, obligation to implement rights on inventions obtained and to provide licences by common consent;
    d. The possibility of joint ownership of intellectual property rights according to the degree of contribution.

2 Indicative List of Typical Mutually Agreed Terms

44. The following provides an indicative list of typical mutually agreed terms:
    a. Type and quantity of genetic resources, and the geographical/ecological area of activity;
    b. Any limitations on the possible use of the material;
    c. Recognition of the sovereign rights of the country of origin;
    d. Capacity–building in various areas to be identified in the agreement;
    e. A clause on whether the terms of the agreement in certain circumstances (e.g. change of use) can be renegotiated;
    f. Whether the genetic resources can be transferred to third parties and conditions to be imposed in such cases, e.g. whether or not to pass genetic resources to third parties without ensuring that the third parties enter into similar agreements except for taxonomic and systematic research that is not related to commercialization;
    g. Whether the knowledge, innovations and practices of indigenous and local communities have been respected, preserved and maintained, and whether the customary use of biological resources in accordance with traditional practices has been protected and encouraged;
    h. Treatment of confidential information;
    i. Provisions regarding the sharing of benefits arising from the commercial and other utilization of genetic resources and their derivatives and products .

3 Benefit–Sharing

45. Mutually agreed terms could cover the conditions, obligations, procedures, types, timing, distribution and mechanisms of benefits to be shared. These will vary depending on what is regarded as fair and equitable in light of the circumstances.

Types of Benefits

46. Examples of monetary and non–monetary benefits are provided in appendix II to these Guidelines.

Timing of Benefits

47. Near–term, medium–term and long–term benefits should be considered, including up–front payments, milestone payments and royalties. The time–frame of benefit–sharing should be definitely stipulated. Furthermore, the balance among near–term, medium–term and long–term benefit should be considered on a case–by–case basis.

Distribution of Benefits

48. Pursuant to mutually agreed terms established following prior informed consent, benefits should be shared fairly and equitably with all those who have been identified as having contributed to the resource management, scientific and/or commercial process. The latter may include governmental, non–governmental or academic institutions and indigenous and local communities. Benefits should be directed in such a way as to promote conservation and sustainable use of biological diversity.

Mechanisms for Benefit–Sharing

49. Mechanisms for benefit–sharing may vary depending upon the type of benefits, the specific conditions in the country and the stakeholders involved. The benefit–sharing mechanism should be flexible as it should be determined by the partners involved in benefit–sharing and will vary on a case–by–case basis.
50. Mechanisms for sharing benefits should include full cooperation in scientific research and technology development, as well as those that derive from commercial products including trust funds, joint ventures and licences with preferential terms.

V Other Provisions

A Incentives

51. The following incentive measures exemplify measures which could be used in the implementation of the guidelines:
    a. The identification and mitigation or removal of perverse incentives, that may act as obstacles for conservation and sustainable use of biological diversity through access and benefit–sharing, should be considered;
    b. The use of well–designed economic and regulatory instruments, directly or indirectly related to access and benefit–sharing, should be considered to foster equitable and efficient allocation of benefits;
    c. The use of valuation methods should be considered as a tool to inform users and providers involved in access and benefit–sharing;
    d. The creation and use of markets should be considered as a way of efficiently achieving conservation and sustainable use of biological diversity.

B Accountability in Implementing Access and Benefit–Sharing Arrangements

52. Parties should endeavor to establish mechanisms to promote accountability by all stakeholders involved in access and benefit–sharing arrangements.
53. To promote accountability, Parties may consider establishing requirements regarding:
    a. Reporting; and
    b. Disclosure of information.
54. The individual collector or institution on whose behalf the collector is operating should, where appropriate, be responsible and accountable for the compliance of the collector.

C National Monitoring and Reporting

55. Depending on the terms of access and benefit–sharing, national monitoring may include:
    a. Whether the use of genetic resources is in compliance with the terms of access and benefit–sharing;
    b. Research and development process;
    c. Applications for intellectual property rights relating to the material supplied.
56. The involvement of relevant stakeholders, in particular, indigenous and local communities, in the various stages of development and implementation of access and benefit–sharing arrangements can play an important role in facilitating the monitoring of compliance.

D Means for Verification

57. Voluntary verification mechanisms could be developed at the national level to ensure compliance with the access and benefit–sharing provisions of the Convention on Biological Diversity and national legal instruments of the country of origin providing the genetic resources.
58. A system of voluntary certification could serve as a means to verify the transparency of the process of access and benefit–sharing. Such a system could certify that the access and benefit–sharing provisions of the Convention on Biological Diversity have been complied with.

E Settlement of Disputes

59. As most obligations arising under mutually agreed arrangements will be between providers and users, disputes arising in these arrangements should be solved in accordance with the relevant contractual arrangements on access and benefit–sharing and the applicable law and practices.

60. In cases where the access and benefit–sharing agreements consistent with the Convention on Biological Diversity and national legal instruments of the country of origin of genetic resources have not been complied with, the use of sanctions could be considered, such as penalty fees set out in contractual agreements.

F Remedies

61. Parties may take appropriate effective and proportionate measures for violations of national legislative, administrative or policy measures implementing the access and benefit–sharing provisions of the Convention on Biological Diversity, including requirements related to prior informed consent and mutually agreed terms.

Appendix I

Suggested Elements for Material Transfer Agreements

Material transfer agreements may contain wording on the following elements:

A Introductory Provisions

1. Preambular reference to the Convention on Biological Diversity
2. Legal status of the provider and user of genetic resources
3. Mandate and/or general objectives of provider and, where appropriate, user of genetic resources

B Access and Benefit–Sharing Provisions

1. Description of genetic resources covered by the material transfer agreements, including accompanying information
2. Permitted uses, bearing in mind the potential uses, of the genetic resources, their products or derivatives under the material transfer agreement (e.g. research, breeding, commercialization)
3. Statement that any change of use would require new prior informed consent and material transfer agreement
4. Whether intellectual property rights may be sought and if so under what conditions
5. Terms of benefit–sharing arrangements, including commitment to share monetary and non–monetary benefits
6. No warranties guaranteed by provider on identity and/or quality of the provided material
7. Whether the genetic resources and/or accompanying information may be transferred to third parties and if so conditions that should apply
8. Definitions
9. Duty to minimize environmental impacts of collecting activities

C Legal Provisions

1. Obligation to comply with the material transfer agreement
2. Duration of agreement
3. Notice to terminate the agreement
4. Fact that the obligations in certain clauses survive the termination of the agreement
5. Independent enforceability of individual clauses in the agreement
6. Events limiting the liability of either party (such as act of God, fire, flood, etc.)
7. Dispute settlement arrangements
8. Assignment or transfer of rights
9. Assignment, transfer or exclusion of the right to claim any property rights, including intellectual property rights, over the genetic resources received through the material transfer agreement
10. Choice of law
11. Confidentiality clause
12. Guarantee

Appendix II

Monetary and Non–Monetary Benefits

1. Monetary benefits may include, but not be limited to:
   a. Access fees/fee per sample collected or otherwise acquired;
   b. Up–front payments;
   c. Milestone payments;
   d. Payment of royalties;
   e. Licence fees in case of commercialization;
   f. Special fees to be paid to trust funds supporting conservation and sustainable use of biodiversity;
   g. Salaries and preferential terms where mutually agreed;
   h. Research funding;
   i. Joint ventures;
   j. Joint ownership of relevant intellectual property rights.
2. Non–monetary benefits may include, but not be limited to:
   a. Sharing of research and development results;
   b. Collaboration, cooperation and contribution in scientific research and development programmes, particularly biotechnological research activities, where possible in the provider country;
   c. Participation in product development;
   d. Collaboration, cooperation and contribution in education and training;

e. Admittance to *ex situ* facilities of genetic resources and to databases;
f. Transfer to the provider of the genetic resources of knowledge and technology under fair and most favourable terms, including on concessional and preferential terms where agreed, in particular, knowledge and technology that make use of genetic resources, including biotechnology, or that are relevant to the conservation and sustainable utilization of biological diversity;
g. Strengthening capacities for technology transfer to user developing country Parties and to Parties that are countries with economies in transition and technology development in the country of origin that provides genetic resources. Also to facilitate abilities of indigenous and local communities to conserve and sustainably use their genetic resources;
h. Institutional capacity–building;
i. Human and material resources to strengthen the capacities for the administration and enforcement of access regulations;
j. Training related to genetic resources with the full participation of providing Parties, and where possible, in such Parties;
k. Access to scientific information relevant to conservation and sustainable use of biological diversity, including biological inventories and taxonomic studies;
l. Contributions to the local economy;
m. Research directed towards priority needs, such as health and food security, taking into account domestic uses of genetic resources in provider countries;
n. Institutional and professional relationships that can arise from an access and benefit–sharing agreement and subsequent collaborative activities;
o. Food and livelihood security benefits;
p. Social recognition;
q. Joint ownership of relevant intellectual property rights.

Endnotes

1 ten Kate, K & S A Laird (eds). 1999.*The Commercial Use of Biodiversity*. 1999. Earthscan, London.
2 For example, 11 of the 25 best–selling blockbuster drugs in 1997, representing 42 per cent of industry–wide sales and with a total value of $17.5 billion, are biologicals, natural products or entities derived from natural products (Newman & Laird, 1999). Of the 87 cancer drugs approved by the US Food and Drug Administration between 1985–1995, 62 per cent are of natural origin or are modelled on natural product parents (Cragg et al, 1997).
3 *Beyond Borders: Ernst & Young's Global Biotechnology Report 2003* (Ernst & Young, 2003)
4 *Ibid* at 4.
5 James, C. 2002. *Global Status of Commercialized Transgenic Crops: 2002*. ISAAA Briefs No. 26. ISAAA: Ithaca, NY. ISBN: 1–892456–31–1
6 *Ibid* at 4.
7 MedAd News. 2001. Top 500 prescription drugs by worldwide sales, 2000. pp 70–75.
8 Svarstad, H, S Dhillion, and HC Bugge. 2002. Novartis' Golden Eggs from a Norwegian Goose. *In* Laird, SA (ed). B*iodiversity and Traditional Knowledge: Equitable Partnerships in Practice.* Earthscan, London.
9 ten Kate, K, L Touche, A Collis and A Wells. 2002. 'Access to genetic resources and benefit–sharing in a protected area: an agreement between Yellowstone National Park and the Diversa Corporation'. In Laird, SA (ed). *Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice.* Earthscan, London.
10 Also see UNEP/SCBD, *Report of the Ad Hoc Technical Expert group on Protected Areas*, document UNEP/CBD/AHTEG/PA/1/3, (SCDB, 14 June 2003) ("document UNEP/CBD/AHTEG–PA/1/3, June 2003").
11 Stolton, S and N Dudley (eds). 1999, *Partnerships for Protection*, Earthscan, London.
12 Document UNEP/CBD/AHTEG–PA/1/3, June 2003.
13 James, AN, M Green and J Paine. 1999. *A Global Review of Protected Area Budgets and Staffing. World Conservation Monitoring Centre*, Cambridge, UK.
14 Janzen, DH, W. Hallwachs, R. Gamez, A. Sittenfeld, and J. Jimenez (1993), 'Research Management Policies: Permits for Collecting and Research in the Tropics'. In. Reid, WV, SA Laird, CA Meyer, R. Gamez, A. Sittenfeld, DH Janzen, MA Gollin, C. Juma. 1993. *Biological Prospecting: Using Genetic Resources for Sustainable Development*. Washington, DC: The World Resources Institute.
15 For example, Australia receives over $AUD2 billion from 8 national parks, which cost the government some $AUD60 million to run. Costa Rica spends around $US 12 million to maintain its national parks, but foreign exchange generated by parks in 1991 was more than $US 330 million, with park–generated tourism the second largest industry in the country (IUCN, 1998).
16 Document UNEP/CBD/AHTEG–PA/1/3, June 2003.
IUCN, 2000. *Financing Protected Areas: Guidelines for Protected Area Managers*. No. 5. Financing Protected Areas Task Force of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Unit of IUCN.
IUCN, 1998. Economic Values of Protected Areas: Guidelines for Protected Area Managers. No. 2. Task Force on Economic Benefits of Protected Areas of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Service Unit of IUCN.
17 The Ad Hoc Technical Expert Group on Protected Areas (AHTEG) to the CBD discussed innovative strategies and instruments for financing protected areas at its meeting in June 2003. These included debt for nature swaps, conservation trust funds, and user fees, taxes and other charges. Bioprospecting fees were included in the latter category, along with fees for PA entry, concessions, royalties for resource extraction, payment for ecosystem services, fuel and property taxes, and fines for illegal logging, hunting, fishing, and pollution damage (document UNEP/CBD/AHTEG–PA/1/3, p 56).
18 Instituto Nactional de Biodiversida (INBio). 2002. 'Bioprospecting: An Essential Component in the Conservation Strategy'. San Jose Costa Rica: INBio.
19 *Ibid* at 15.
20 Mugabe, J, C Barber, G Henne, L Glowka, and A La Vina. 1997. *Access to Genetic Resources: Strategies for Sharing Benefits*. ACTS Press, Nairobi. Glowka, L. 1998. *A Guide to Designing Legal Frameworks to Determine Access to Genetic Resources.* Environmental Policy and Law Paper No.34, Bonn: IUCN Environmental Law Centre.
21 For example, see the Philippines' 1997 Indigenous Peoples Rights Act (IPRA) and Peru's Law No 27811 Law Introducing a Protection Regime for the Collective Knowledge of Indigenous Peoples Derived from Biological Resources (approved by Congress in August 2000).
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27 Alexiades, M. N., and S. A. Laird. 2002. 'Laying the Foundation: Equitable Biodiversity Research Relationships.' In S. A. Laird, ed., *Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice.* London: Earthscan.
28 *Ibid* at 2.
29 Articles 15 to 21 deal respectively with: access to genetic resources; access to and transfer of technology; exchange of information; technical and scientific co–operation; handling of biotechnology and distribution of benefits; financial resources; and financial mechanism.
30 Article 16(5), CBD.
31 Human genetic resources and ex–situ genetic resources collected before the entry into force of the CBD are excluded from the scope of the CBD.
32 Paragraph 24, Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of their Utilization (Annex to Decision VI/24 'Access and benefit–sharing as related to genetic resources', UNEP/CBD/COP/6/20). Hereafter referred to as 'Bonn Guidelines'.
33 Paragraphs 51–61, Bonn Guidelines.
34 See paragraphs (a), (b), (c) and (e) of Article 8.
35 See http://www.biodiv.org/.
36 (Glowka, 1998; Barber et al, 2002)
37 Key capacities that have been identified in the CBD process include: legislative capacities of countries; administrative capacity of key institutions (e.g. national focal points and competent national authorities); taxonomic information and capacities on biological resources; indigenous and local communities' ability to participate in all steps of the process; commercial skills of relevant public institutions (e.g. herbarium, universities and research institutes); development and management of intellectual property systems; and contract negotiation skills. See decision VI/24/B of the Conference of the Parties available at http://www.biodi.org/cop/6/decisions. Also

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61 This Annex draws significantly upon the piece by ten Kate et al (2002).

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