Preparing a national strategy on access to genetic resources and benefit-sharing

A pilot study by

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INTRODUCTION

This manual presents some ideas on how to develop a national strategy on access to genetic resources and benefit-sharing (ABS). It offers initial suggestions for a participatory strategy process, tools for the formulation of strategy in the face of complexity and uncertainty, as well as some information on experience to date. We hope that it will contribute to the current debate on these issues and be useful to planners in government, communities, research organisations and the private sector. The manual itself is divided into 5 parts, described below, a Tool Kit (pages 41 to 55) and an appendix of supplementary information (pages 57 to 70).

Part 1 'Thinking strategically about ABS' (pages 5 – 10) introduces the issues discussed in this document. It describes some of the benefits of strategic thinking on access and benefit-sharing (ABS). These include the development of informed and realistic policy that meets the needs identified as priorities by stakeholders and helps a country to remain competitive in the face of uncertainty and change. Part 1 also explores the nature of strategy and outlines a strategy process, comprising the four key phases of assessment, strategy formulation, action planning and implementation. This manual focuses on assessment and strategy formulation.

Part 2 'Getting started' (pages 11 – 18) looks at how to get started with an ABS strategy and how to define the scope of the exercise. Part 2 discusses the importance of 'mainstreaming' (i.e. integrating ABS into environmental, economic and social policy) and identifies key links between ABS and different sectors of the economy, government departments and stakeholder groups. It also identifies legal and policy initiatives into which an ABS strategy could be integrated, e.g. consultative processes for the development of ABS legislation, National Biodiversity Strategies and Action Plans, technology foresight initiatives, as well as sectoral plans in related fields such as health. Part 2 also describes the necessity and challenges of stakeholder participation, and lists other pre-conditions for a successful strategy process, e.g. an interagency body to oversee the strategy's development and implementation, as well as adequate finance and capacity.

Part 3 'Assessment' (pages 19 – 24) outlines the information needed to create an ABS strategy, namely a good awareness of the 'resources' available within a country, the needs and priorities of stakeholders (including government departments, local communities, research institutions and the private sector), the legal and institutional framework, and the opportunities available through ABS partnerships. Resources include not only genetic resources and associated information, but the capacities of people and organisations. Stakeholders' needs include demand for access to genetic resources as well as priorities for benefit-sharing and capacity building.

Part 4 'Formulating an ABS strategy' (pages 25 – 36) explores a number of techniques used by environmental and corporate strategists to manage change and uncertainty, both key considerations in the complex and fast-moving field of ABS. Part 4 of the manual outlines the three stages of formulating a strategy. First, creating a shared vision of future direction. Second, framing the country's core strategy for success, by articulating its distinctive competencies and competitive advantage, identifying requirements for a conducive legal and policy framework and matching domestic needs and priorities with available benefits. Third, completing the strategy by identifying and selecting options to achieve each element of the core strategy, evaluating these and choosing and articulating the best ones. Part 4 also describes the importance of 'fit and alignment' between the various components, so that the whole strategy is internally consistent and self-reinforcing.

Part 5 'Implementation' (pages 37 – 39) outlines a few issues and techniques related to ABS for the stages of the planning cycle that follow the development of the strategy. These include formulating an action plan, and monitoring and evaluating its implementation. As this manual focuses on the strategy development stage, part 5 is brief.

CONCLUSIONS

1. The need for strategy on access and benefit-sharing (ABS)

See Part 1.1, 1.2, 1.3

ABS partnerships can be a source of sustainable economic development, providing a country and its stakeholders with benefits such as improved capacity for conservation, new products and income to meet basic needs such as healthcare and food security, as well as support for value-added scientific research. However, ABS embraces a complex, varied and unpredictable set of issues, linked to policy-making in many areas of government, as well as to domestic and global markets. The uses of genetic resources are diverse and the stakeholders involved range from multinational companies to indigenous communities, each with different priorities. In addition, demand for access to genetic resources fluctuates significantly and can be difficult to predict in the medium- to long-term. There are no simple ways to put a finite price on the value of genetic resources and associated knowledge, nor to weigh up the benefits that could arise from access to a country's genetic resources. Nor are there simple ways to judge whether individual partnerships involving access are fair and equitable, nor to assess how ABS policy can contribute to national sustainable development.

Without an informed strategy to address this complexity, ABS law and policy can miss opportunities to contribute to conservation and sustainable development, inadvertently stifle equitable and beneficial partnerships and alienate stakeholders. The most beneficial ABS partnerships are likely to be achieved with the guidance and support of a mixture of policy measures, including simple and flexible legislation (with indicative rather than prescriptive benefits) and a suite of complementary measures. Complementary measures might include: an ABS strategy; indicators and guidelines tailored to the different uses and users of genetic resources; model agreements; case studies illustrating best practice, successes and failures in ABS partnerships; and public education and capacity building measures. An ABS strategy provides the basis for workable and needs-based laws, policies and partnerships. It can help a country and its stakeholders cope with change, uncertainty and the need for competitiveness in local and global markets for genetic resources. If developed as a participatory process, an ABS strategy can help stakeholders to articulate and understand each others' needs and interests, and to find workable trade-offs between them. It can also build the stakeholder 'ownership' necessary for fair and successful implementation of ABS regulations and partnerships.

2. The scope and scale of the strategy

See Part 2.3, 2.4, 2.5

An ABS strategy could either stand alone or form a component of an existing initiative, e.g. a National Biodiversity Strategy and Action Plan (NBSAP), National Sustainable Development Strategy (NSDS), biotechnology strategy or technology foresight initiative. But in either case, an ABS strategy will need to be integrated with a wide range of existing law and policy. An ABS strategy could be developed as a small-scale initial strategy, e.g. resulting from a one-week workshop, or as a full-scale strategy based on nation-wide participation over many months. This will depend on the resources available, existing institutional commitments and on whether ABS is a national priority. Starting on a modest scale and learning by doing (e.g. through pilot projects on ABS) is preferable to no strategy at all, or to developing a strategy that is too ambitious to implement. Interim measures such as ABS guidelines could help protect the rights of a country and its stakeholders while an ABS strategy and access legislation is under development.

3. Prerequisites for a successful strategy exercise

See Part 2.1, 2.2, 2.6, 2.7

Many strategies and plans remain paper exercises. Key stakeholders may lack the resources, motivation and awareness to participate. When developing an ABS strategy, politically powerful champions may be required to secure the involvement of key ministries, as well as cooperation between federal/national and state governments. One solution might be an interagency body to lead the strategy process and to share responsibility for co-ordinating its design and implementation across a variety of government departments, NGOs and other stakeholders. High-level, cross-sectoral support is essential to the technical team mandated with facilitating an ABS

strategy. Relevant stakeholders need to be involved from the start and throughout the process. In addition, the strategy team will require the skills to: assess the resource base available; identify linkages with existing strategies and activities; facilitate dialogue between stakeholders; and to create strategy out of the ideas that emerge. However, planning exercises are often challenged by a mismatch between expectations and available resources. Before starting, the strategy team must ensure it has sufficient time, human resources, money, public awareness and stakeholder commitment. A small-scale strategy designed within the human and financial resources available to a country stands a greater chance of implementation than an overambitious one that might not achieve its goals. If successful, a small-scale strategy can always be revised and expanded.

4. Assessment before strategy

See Part 3.1, 3.2, 3.3

Some ABS measures have not achieved their conservation and development objectives because they do not reflect the needs and capacities of domestic and foreign stakeholders. To avoid this, an ABS strategy should be guided by: (i) the best available information on a country's genetic resources and associated knowledge and its human and institutional capacities; (ii) the legal framework governing the conservation and sustainable use of these resources, and, in particular access and benefit-sharing; and (iii) the needs of stakeholders, including their demand for access to genetic resources and priorities for benefits that can be obtained through ABS partnerships. An ABS strategy should reflect best practice in the benefits available under different types of ABS partnership, e.g. for academic research or commercial development. It should also reflect a good understanding both of markets for products derived from genetic resources within a variety of industry sectors, e.g. pharmaceuticals or botanical medicines, as well as the way that scientific institutions use genetic resources.

5. Developing a strategy

See Part 4.1, 4.2, 4.3, 4.4, 4.5

Strategy is neither an exhaustive wish-list of possible goals, nor piecemeal improvement of the *status quo*. It involves the development of a coherent vision of future direction and new ways of doing things. Dialogue with the providers and users of genetic resources, both within the country and abroad, can elicit insights and lessons learned about the trends, risks and opportunities that will form the basis of the strategy. The strategy team and stakeholders should start by developing a shared vision. They should then use the wide range of tools available to develop and evaluate options to achieve this. The strategy should explore ways to cope with stakeholders' concerns as well as the uncertainty and change involved in ABS. It should identify policies and partnerships that can support national competitiveness, as well as conservation and development priorities. The strategy can set out priorities for strengthening and changing the country's knowledge-base, technologies, institutions and laws. Above all, the strategy must be selective. It is better to pick a handful of priority goals, successfully implement these and return to others in future strategies rather than to be overoptimistic.

6. Translating strategy into action

See Part 5.1, 5.2

Translating a strategy into action requires the participation of institutions with the capacity and resources to design and implement an action plan. The plan should reflect the financial, technical and human resources available and identify where further investment is needed. Individual actions must be budgeted and, where necessary, proposals prepared for donors. To avoid the action plan developing into a 'wish list', it must reflect core elements of the ABS strategy. It should be selective and prioritised and include targets and identified actors. Each action will need to be measurable. Where capacity is limited, it may be useful in the short to medium term for the action plan to comprise a small number of actions to be implemented through budgeted pilot projects. Monitoring and assessment of the impact of implementation is essential. This requires a choice of suitable indicators as well as the participation of those directly affected. Indicators need to be verifiable in as cost-effective a manner as possible. Stakeholder task forces, responsible for measuring, compiling and assessing progress and impact might be a suitable solution.

PART 1: THINKING STRATEGICALLY ABOUT ACCESS TO GENETIC RESOURCES AND BENEFIT-SHARING

1.1 Why think strategically about access and benefit-sharing?

1.1.1 The significance of access and benefit-sharing

Genetic resources can be defined as biological materials of actual or potential value, containing functional units of heredity (Article 2, Convention on Biological Diversity (CBD)). Access to genetic resources is vital for food security, health and sustainable development. Genetic resources provide the basis for the improvement of crops, for at least a quarter of new pharmaceuticals, for traditional medicines for 75% of the world's population and, increasingly, for biotechnology products that treat waste and support clean industrial development. Annual global sales of products derived from genetic resources in the pharmaceuticals, botanical medicines, major crops, horticulture, crop protection, biotechnology (in fields other than healthcare and agriculture), and cosmetics and personal care sectors lie between US$500 and $800bn annually (ten Kate and Laird, 1999). See also Appendix 1.1.

Despite the value of genetic resources in economic terms (not to mention the cultural, religious and aesthetic values of biodiversity), many experts agree that biodiversity is declining rapidly (ibid). 179 governments and the European Community have responded by ratifying the CBD, whose objectives are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources (CBD Article 1). The commitment by governments both to facilitate access to genetic resources and to share the benefits that arise fairly and equitably (CBD Article 15) reflects the hope that genetic resources can provide the basis for a competitive and sustainable economy and an economic incentive for conservation.

Some 50 countries (Appendix 1.2) have adopted or are developing laws to regulate access to their genetic resources in exchange for benefits such as participation in research, capacity building, technology transfer and a share in royalties on sales of final products. In many cases, these laws also regulate access to associated knowledge and to derivatives of genetic resources. Will these laws promote fair partnerships that will support economic development and conservation? Only if they are properly informed, and reflect commitment and capacity for implementation. We believe that the preparation of a national strategy on ABS – even if this is a modest exercise – will help countries achieve these goals.

1.1.2 The scope, complexity and uncertainty of access and benefit-sharing

A variety of domestic and foreign actors conserve, exchange and use genetic resources. Stakeholders include national, regional and local governments, local and indigenous communities, as well as national and foreign scientific organisations. Private sector involvement ranges from the family selling garden produce and the individual entrepreneur, to the multinational company. National treasuries, bilateral and multilateral donors, as well as capital markets, all invest in the exchange and use of genetic resources. ABS therefore encompasses agriculture, health, energy, education, science and technology, trade and industry, law, indigenous affairs, finance, economic development and foreign relations.

Given the range of actors and activities involved, it is no surprise that the benefits generated are equally diverse. Reciprocal access to other genetic resources, opportunities for *in situ* and *ex situ* conservation, access to information and research results, participation in research, technology transfer, and training and capacity building can all arise within access partnerships. Where partnerships result in commercial products, financial benefits can include milestone payments and royalties.

Biodiversity planners also face significant uncertainty. How much biodiversity and associated knowledge is there and how important is it? How quickly is it disappearing and what impact will this have on the health and prospects of the nation? Who are the key stakeholders influencing and affected by the conservation or loss of biodiversity? How effective are different methods to conserve and use biodiversity sustainably? What is the value of genetic resources? How can access to genetic resources be regulated to provide stakeholders with an equitable share of the benefits and thus an economic incentive to conserve biodiversity? How much demand for access to genetic resources is there, and is this demand likely to grow or dwindle in the short, medium and long term? How can a country gain a competitive advantage through access and benefit-sharing? These questions pose a major challenge for governments designing and implementing access and benefit-sharing measures.

Scientists, communities and companies within the countries that already have access legislation, as well as their potential partners from abroad, report that some of the laws introduced to date with the goal of promoting equitable ABS partnerships have often unwittingly hindered domestic research and partnerships with foreign organisations, thus blocking the very capacity building that such laws may specify as an important objective (see ten Kate and Laird, 1999). For example, since Philippines Executive Order 247 came into force in 1995, 2 out of only 11 research applications for access have been approved (Swiderska, Dubois and Daño, 2001). Policy-makers in the Philippines and some countries of the Andean Pact are reviewing the implementation of their vanguard access regulations to address these problems. This manual is based on the premise that a national strategy on ABS might provide a better basis for designing ABS law and policy than following regulatory precedents set in other countries, and can help countries that already have ABS laws in place determine how to implement them.

1.1.3 Strategic planning as a solution

Since the mid-1990s, when a handful of countries first introduced regulations on access, commentators have pointed out the benefits of a strategic approach to access and benefit-sharing (ten Kate, 1995; Glowka, 1995; ten Kate and Laird, 1999). At its first meeting in 1999, the CBD Panel of Experts on ABS 'strongly endorsed the importance of preparing national strategies on access and benefit-sharing as part of national biodiversity strategies, prior to developing legislative, policy or administrative measures on the same, in conformity with the needs of the country' (UNEP/CBD/COP/5/8).[1] The Panel re-emphasised this point at its second meeting in 2001.[2] A package of measures, both at national and international levels, is probably the most effective way to make progress on ABS. As the Expert Panel recommended, this package should include and be guided by a national strategy on ABS (other components of such a package might include guidelines, indicators, model agreements, information exchange mechanisms and capacity-building activities) (UNEP/CBD/WG-ABS/1/2).

An ABS strategy can help establish an integrated framework to deal with the overlapping economic, social and environmental aspects of access and benefit-sharing. It can identify synergies and trade-offs between the widely differing needs, priorities and concerns of stakeholders, as well as ways to address these through flexible policy measures (such as access legislation) and equitable partnerships. Another advantage of an ABS strategy is that it might support the implementation of existing related strategies, such as strategies on botanical medicines or on science and technology (see Section 2.5 and Appendix 2.4).

[1] Para. 92; see also paras. 61, 93, 148, 149 and 152.

[2] Para. 51 'Legislative, administrative or policy measures on access and benefit-sharing should be based on a clear national strategy on access and benefit-sharing, coordinated with a national biodiversity strategy and action plan or other relevant planning process related to biological diversity. The strategy should consider how different approaches to the regulation of access may affect the strategy's objectives' (UNEP/CBD/WG-ABS/1/2).

A strategic approach can help policy-makers and institutions anticipate and deal with the change and uncertainty[3] inherent in the use of genetic resources. It can help them adapt to shifts in demand for access to genetic resources, which are hard to predict and likely to fluctuate, just as they have done over the last four decades (Appendix 1.1). Demand for access is highly susceptible to changes in science and technology, law and policy. Furthermore, supply of genetic resources generally outstrips demand. However, a strategy on ABS, is not just about responding to demand for access. A strategy is also necessary to help channel the incentives and capacity generated by ABS partnerships into the conservation and sustainable use of genetic resources, e.g. ensuring that partnerships address the capacity building priorities of *ex situ* collections.

In the face of uncertain demand, strategic planning can help countries identify what is necessary to gain 'competitive edge'.[4] This may include:

- investment in unique and valuable capabilities, as a basis for future partnerships, e.g. strengthening national capacity for value-added research; and,
- elimination of factors preventing the development of partnerships, e.g. illegal access to genetic resources, lack of clarity on the regulation of access and bureaucratic and complex access regulations.

Undertaken as a cyclical process of consultation, analysis, action and feedback, an ABS strategy can build flexibility into legal and institutional frameworks for access and benefit-sharing. Flexibility will enable countries to adapt to changes in stakeholders' priorities and different circumstances, thus gaining the most from available opportunities and avoiding some of the major pitfalls.

Which countries should consider preparing an ABS strategy? Since the world's biological diversity is distributed largely in inverse proportion to scientific and technological capacity, developing countries are often characterised as 'providers' of genetic resources, and developed countries as 'users' or 'importers'. More accurately, countries are interdependent on each others' genetic resources for food security and other uses. All countries are consequently both 'providers' and 'users' of genetic resources. A country will need to address each of these functions when reviewing activities and policies as part of its ABS strategy. Indeed, New Zealand's NBSAP and South Africa's Biodiversity White Paper[5] each acknowledge the need to develop policy measures governing access both at home and abroad.

The responsibilities of countries in their role as importers and users of genetic resources was stressed by the second meeting of the CBD Panel of Experts on ABS (UNEP/CBD/WG-ABS/1/2). Issues related to countries' roles as users and importers of genetic resources are flagged in Appendix 1.3 , and include:

- assessment of demand for and use of genetic resources from other countries, and the current practice of national stakeholders in obtaining prior informed consent and in sharing benefits with foreign providers of genetic resources;
- options for legislative and voluntary measures (such as Guidelines and Codes of Conduct) to encourage national stakeholders to obtain prior informed consent, share benefits and respect the CBD and access laws around the world;
- review of intellectual property arrangements to support ABS partnerships;

[3] Recent literature on National Strategies for Sustainable Development also recognises the need to account for future change and uncertainty, and to allow space for contingency planning. See, for example, a dicussion paper by DfID/IIED/ODI, '*Can country-level strategic planning frameworks achieve sustainability and eliminate poverty*?' on www.nssd.net/index.html

[4] See also: Porter, 1996.

[5] Objective 3.2 of South Africa's Biodiversity White Paper states that, '[w]hile embracing a consistent approach to control access to indigenous genetic resources, Government recognises the mutual interdependence of nations on the global genepool of biodiversity….The development of specific strategies to ensure continued access to genetic resources for food, agriculture and forestry is considered to be of paramount importance' (Department of Environmental Affairs and Tourism (DEAT), South Africa, 1997).

- grants and funding mechanisms to support the establishment and publicising of fair and equitable access and benefit-sharing partnerships; and
- actions to increase awareness of ABS issues within domestic scientific and commercial circles.

All countries, therefore, would benefit from an ABS strategy. Those for whom it is a priority include:

- Those preparing or thinking of developing access laws and other policy measures
- Those with high , particularly endemic, biological diversity
- Countries which are significant users and importers of genetic resources

To date, however, the majority of countries which have taken legislative and policy measures on ABS, and have addressed ABS in their NBSAPs, are developing countries whose responses have been predominantly to protect their position as providers. For this reason, the majority of illustrations in this manual are drawn from these countries and may, therefore, appear to offer lessons mainly for other countries intending to regulate access to their genetic resources. Nevertheless, we recommend that all countries should still evaluate these experiences when developing policy responses that fulfil their responsibilities as users.

Perhaps ideal timing for an ABS strategy is prior to the development of national law and policy on ABS. However, there may be circumstances in which an ABS strategy may follow the development of legislative and policy measures, e.g. Bolivia, which, in common with other countries in the Andean Pact, already has ABS regulations, is now developing an ABS strategy to guide its implementation. To give another example, the development of a Biodiversity White Paper in South Africa raised awareness and understanding amongst stakeholders of ABS issues, placing them in a strong position to contribute to the development of an ABS component for their NBSAP.

1.2 What is strategy?

Strategy is about understanding and continuously adapting to an evolving environment. According to the corporate strategist Michael E. Porter (1996), strategies are based on the assumption that there is no single, ideal position for an organisation. Changes in the business environment constantly open up new opportunities. To retain a 'competitive edge', an organisation needs to identify and capture these opportunities as they emerge. But to do so, it must be ready to transform itself from the inside out, depending on its relative strengths and weaknesses (Porter, 1996).

A strategy is not the same as a plan. Plans are about analysis. They state a destination and set out the steps that must be taken to get there. By contrast, strategic thinking is about synthesis, intuition, creativity and the articulation of a vision of future direction for a country or organisation. It is not just a matter of extrapolating past trends or rearranging established ideas, but of identifying new trends and ways of doing things (Mintzberg, 1994; Porter,1996). A strategy sets the vision, and a plan makes it operational. Both are needed to help countries or organisations face the future.

Strategy works best as a continuous process, capturing what is learned from all sources, within the country and abroad, about trends, risks and opportunities and integrating the insights generated into a coherent vision of future direction. There are few sources of ideas better than the people and organisations directly involved. Stakeholder dialogue is essential to draw together ideas and insights from providers and users of a country's genetic resources in order to:

(i) identify partnership opportunities that support national conservation and development priorities, as well as stakeholders' concerns relating to these; and,

(ii) take advantage of these opportunities in ways that support national priorities.

For references on strategy, see the bibliography of this Manual, business school journals (e.g. Harvard Business Review); BPSP websites http://www.undp.org/bpsp/ '*Biodiversity Guidelines and Models*'; and documents on National Strategies for Sustainable Development: www.nssd.net.

1.3 The cycle of designing and implementing an ABS strategy

The factors that determine the successes and failures of an ABS strategy will change. For example, the number, roles and skills of stakeholders will evolve over time, and the demand for genetic resources will fluctuate. To maintain 'competitive edge', the strategy will need to adapt to reflect these changes, and so is best viewed as a cycle. There are four phases to the cycle of designing and implementing an ABS strategy: **assessment**, **strategy setting**, **planning** and **implementation**. Feedback from each stage can be reflected in the next phase.

ASSESSMENT: (Part 3, below)

Sometimes referred to as the 'diagnostic' stage, the assessment phase allows the strategy team to know where the country stands. It involves working with a broad range of stakeholders to take stock of the country's **resources, needs** and **opportunities**.

- **Resources: genetic** resources (diversity, endemism, conservation status, sustainable use, etc), **human** resources (associated traditional knowledge and scientific capacities), **legal and institutional** resources (legal status of genetic resources and associated knowledge; technology; capacities of relevant scientific, technical, social and legal institutions); and **financial** resources (for actions and programmes to implement the strategy and plan).
- **Needs:** national priorities for conservation, sustainable use,development, benefit-sharing
- **Opportunities:** environmental, economic and social benefits that can arise from access to genetic resources, including domestic and foreign markets for products derived from genetic resources.

STRATEGY SETTING: (Part 4, below)

This phase involves defining where the country wants to be in the future. There are three phases: creation of a shared **vision**, identification of the **core strategy**, and development of the **elements** of the strategy by identifying and selecting options to achieve them, and ensuring 'fit'.

- **Shared vision:** Work with stakeholders to identify a shared vision for the strategy
- **Core strategy:** Identify priority issues to tackle in the ABS strategy, such as: key areas of competitive advantage, value addition, capacity-building priorities, information gaps and coordination needed between different levels and agencies of government and civil society. Each of these will constitute an element of the core strategy.
- **Options to achieve each element of the core strategy:** Identify and evaluate a number of options to achieve each element of the core strategy, and select the best ones. This includes identifying opportunities and mechanisms for synergies with other strategies and plans, as well as ensuring that the different elements of the strategy combine to form a coherent whole.

PLANNING: (Part 5, below)

This phase describes how to get there. It involves the preparation of an action plan defining **steps**, **actors** and **prioritised targets** that enabling implementation of the strategy.

- **Steps:** Describe actions to achieve each element of the strategy, identify projects and prepare budgets to implement them.
- **Actors:** Identification of those whose action is required to achieve the targets (e.g. different government agencies, communities, NGOs, professional groups, business sectors, etc.) and who bear responsibility for seeing that this happens. Preferably, the action plan will be developed and agreed with these actors.
- **Prioritised targets:** Description of a specific target (preferably quantifiable) for each action, including indicators that will enable stakeholders to determine whether it has been reached, timelines (short, medium and long, preferably defined in terms of years) and prioritisation (high, medium, low priority).
- **Costs and sources of funding:** Spell out the cost and source of funding of each action.

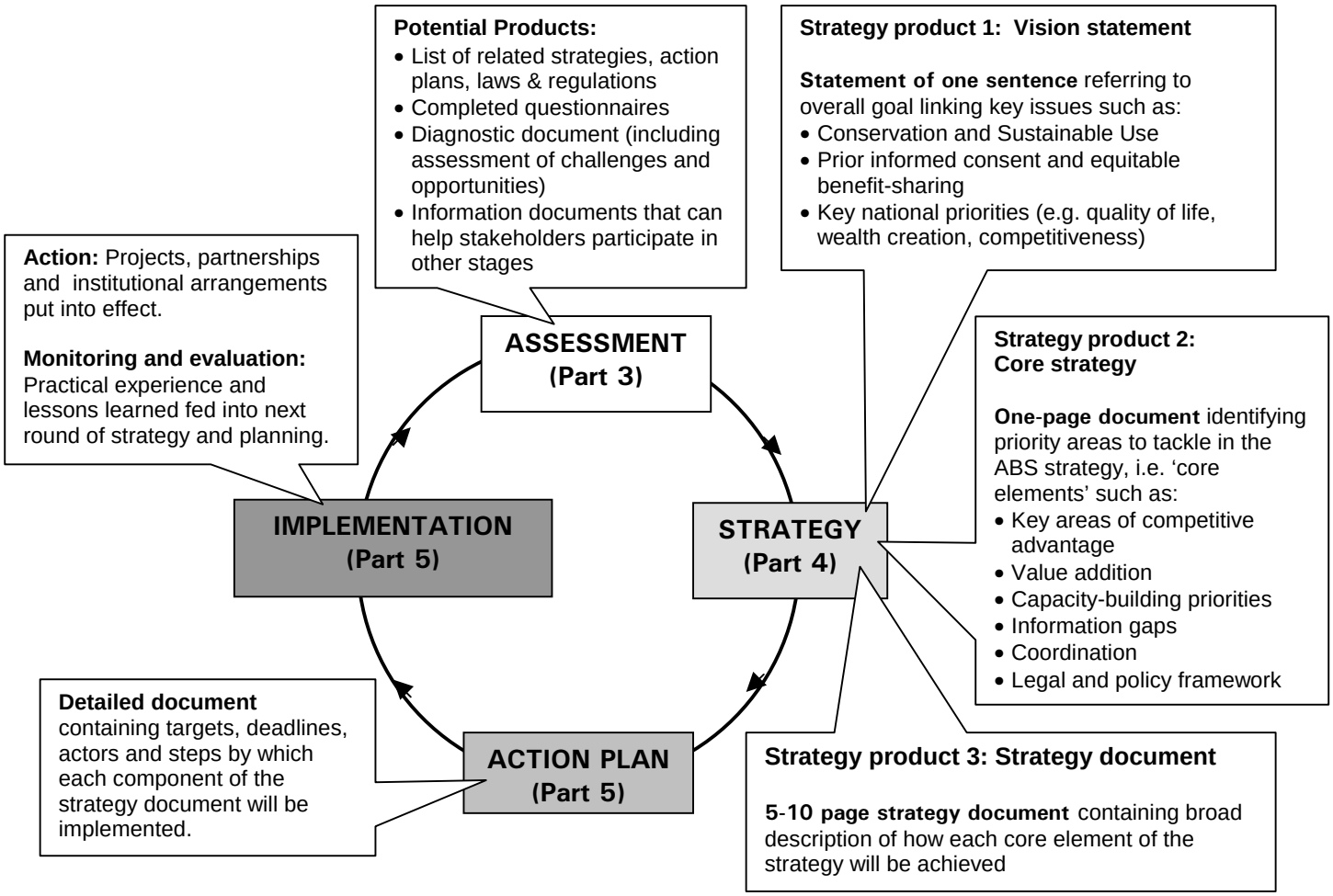
IMPLEMENTATION (MONITORING AND EVALUATION): (Part 5)

This phase involves **implementing** the strategy by carrying out the actions defined in the Action Plan.

- **Monitoring and evaluation:** using **verifiable indicators** identified in the action plan, the progress and impact of implementation is assessed, preferably by those directly affected.
- **Feedback:** based on the successes and failures of implementation, information generated through monitoring and evaluation is used to adjust the action taken and/or the overall strategy.

Figure 1 below represents an idealised process, but the phases of a strategy cycle are not set in stone and the boundaries between them may be blurred. The reality is more of a continuum than clearly defined stages. Activities carried out in one phase may not be tied up neatly before the next phase begins. For instance, the assessment phase may not gather all the information needed to finalise the strategy. As elements of the strategy are developed, the need for more information may emerge, necessitating more research and fact-finding. Also, experience in implementation may help with the evaluation of options for a strategy.

Fig. 1 The cycle of designing and implementing an ABS strategy and the results that might be produced at each stage



PART 2 – GETTING STARTED

2.1 A body to co-ordinate the ABS strategy process

Which government agency should take the lead in co-ordinating the development and implementation of an ABS strategy requires careful thought. This agency - which may come under one of several departments, such as Environment, Agriculture or Science & Technology - may not necessarily be the same one as is responsible for drafting the NBSAP or coordinating ABS legislation. However, given the cross-cutting scope of an ABS strategy, this lead agency will need to work closely with decision-makers across across government, as well as other sectors of society. The success of the strategy will rely upon their active support.

Many countries have attempted to improve cross-sectoral 'buy in' in policy and planning processes by establishing 'steering', 'reference' or 'advisory' committees, with representation from various government agencies, NGOs, the private sector and institutions such as universities. In some cases, these provide purely technical guidance. For example, Australia established an Expert Reference Group to advise a Commonwealth Public Enquiry into ABS, consisting of environmental and IPR lawyers, scientific researchers, and indigenous and private-sector representatives (Voumard, 2000). In other cases, governments have established interagency committees, where lead agencies devolve a share of responsibility for planning to a variety of other government departments and NGOs. Appendix 2.1 provides examples of developing countries that have made use of interagency committees in the design and implementation of ABS law and policy.

Selecting the membership of a co-ordinatory body will have a major bearing on the outcome and implementation of the strategy and is a particularly sensitive and important issue. Appendix 2.1 describes how this was done for the development of South Africa's Biodiversity White Paper (which includes provisions on ABS). A co-ordinated response by key programmes, ministries, departments, NGOs and individuals can, however, be hard to achieve, requiring protracted negotiation. Differing institutional priorities, terms of reference and project timetables can hamper co-ordination, and can result in duplication, inefficient resource use and inconsistent outcomes (GEF, 2000; WRI/IUCN/UNEP, 1995).

The life-span of a co-ordinatory body is also critical, and will need to last beyond the planning phase to oversee implementation. South Africa's National Research and Technology Foresight Project highlighted the division of biodiversity-related issues among government departments as a 'major impediment to implementation' of recommended actions. It therefore identified the need to establish a standing Reference Group for the biodiversity sector (DACST, 1999).

2.2 A technical team to facilitate the strategy process

The technical team responsible for facilitating and drawing up an ABS strategy will require skills at a variety of levels, amongst others:

- to build stakeholder awareness of the potential synergies between ABS and their respective needs and priorities (without raising unrealistic expectations);
- to conduct diagnostic assessments of the available resource base (genetic resources and associated knowledge), as well as the capacities and needs of stakeholders and their institutions;
- to explore linkages between ABS and variety of themes including economics, health, agriculture, forestry, intellectual property rights and others; this would include a review of existing laws, policies, plans and activities;
- to facilitate dialogue amongst stakeholder groups, including communication, negotiation and resolution of potential conflicts (consensus-building); and,

- to capture stakeholder ideas and integrate them into the development of a a strategy, action plan and mechanisms for monitoring and evaluation of implementation.

Based on NBSAP experience, the most crucial role in the strategy team is that of project manager (BPSP - Hagan), responsible for: preparing terms of reference for commissioned studies; organising workshops and other stakeholder consultations; integrating consultants' reports and the results of public consultations; and drafting strategy documents.

A strategy team might also consist of a range of consultants to address specific thematic areas. 13 consultants were appointed to Bolivia NBSAP team to work on 7 thematic areas including genetic resources, ecosystems, protected areas, law, economics, social (indigenous peoples) and wildlife. Under India's NBSAP process, consultants were appointed to co-ordinate 14 thematic working groups, covering themes including ABS and IPRs (Kothari, 2000).

2.3 Deciding on a realistic scale for the strategy

Countries have many existing obligations to develop and implement NBSAPs, NSDSs and other strategies, plans and programmes. They also face shortfalls in the financial, technical and institutional capacity needed to develop strategies and their stakeholders may have limited experience of access and benefit-sharing partnerships. With this in mind, a full-scale national strategy on ABS may be unrealistic in the short term.

As a first step, it may be more realistic for planners to set their sights on developing and implementing a small-scale, initial strategy for ABS. This could target selected stakeholder representatives from groups such as national networks of scientists, NGOs and indigenous peoples' coalitions, industry associations and councils for sustainable development, who can most effectively represent a broader constituency.[6] This would allow these stakeholders to explore each others' needs and priorities, as well as ways of working together. If developed alongside closely-monitored pilot projects[7] on ABS (e.g. ABS partnerships), such a relatively quick and inexpensive approach would also build up hands-on experience of ABS issues, i.e. 'learning by doing'. This might leave a country in a far stronger position to develop more ambitious and inclusive strategies in the longer term. Naturally, any initial activities of this kind would need to respect existing ABS and related laws, or to follow best practice on prior informed consent and benefit-sharing if no such laws are in place.

Another question to address is at what level an ABS strategy should be developed. In some countries it may be appropriate to deal with ABS at the national level, for example as part of an NBSAP. However, several countries that already have NBSAPs intend to further develop and implement them through regional and local action plans. An ABS strategy could therefore form part of these decentralised initiatives.

[6] Pers. comm. Krystyna Swiderska, IIED, 9 Feb. 2001.

[7] The use of pilot projects to inform the strategy process requires effective mechanisms for monitoring and evaluation to feed lessons learned back into the planning cycle. Pers. comm., Rachel Wynberg (2001).

2.4 Identifying the sectoral scope of the strategy

ABS is a cross-sectoral issue, and so an ABS strategy will need to be integrated with a wide range of existing law and policy on, amongst others, biodiversity, science and technology, enterprise development, healthcare and agriculture. This reflects Article 6(b) of the CBD, which requires Parties to 'integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies'. Box 1 provides an indicative list of the sectors an ABS strategy might have to address. Section 4.4.4 explores the linkages between these sectors and ABS.

Box 1 The sectoral scope of an ABS strategy

1. **'Bioenterprise' and markets**
2. **R&D:**
   - Health
   - Biotechnology
   - Agriculture, forests and fisheries
3. **Conservation**
4. **Trade, foreign affairs and development cooperation**
5. **Law**
6. **Indigenous and cultural affairs**

To 'mainstream' ABS into these various sectors, an ABS strategy team will need to identify:

(i) current activities, and components of existing strategies and plans, implementation of which might be enhanced by the development of ABS partnerships. Examples include technology transfer programmes within scientific research institutions, or plant breeding programmes within the private sector; and,

(ii) needs and priorities that ABS partnerships could potentially target, both those identified by stakeholders and those highlighted by existing strategies and plans. Examples might include improved capacity to maintain *ex situ* collections and post-graduate training in molecular biology.

This will help integrate ABS into the national policy agenda, and to identify gaps in that agenda that an ABS strategy will need to address. Gaps may include the lack of competitive research funds to support R&D on natural products, or the lack of clear procedures for obtaining the PIC of local communities for access.[8]

Elements of Bolivia's NBSAP component on ABS were addressed by a range of thematic workshops on agriculture, peasant and indigenous affairs, health, municipalities, science and technology, forests and the private sector (VMARNDF, 2001). India's NBSAP component on ABS also cuts across a range of thematic areas, including economics, livelihoods, culture, microbial diversity and intellectual property rights (India NBSAP matrix, 2001).

2.4.1 Challenges with mainstreaming

The GEF identifies a range of obstacles to cross-sectoral integration in biodiversity planning (GEF 2000). A particular problem facing the integration of ABS into national decision-making processes is lack of awareness, especially amongst agencies in key areas such as economic planning. This is partly due to inadequate information. For example, countries generally lack reliable economic

[8] Prescott, Gauthier and Mbongu Sodi, (2000), 'Guide to Developing a Biodiversity Strategy from a Sustainable Development Perspective', provides useful guidance on accounting for sectoral overlap in biodiversity, available on www.undp.org/bpsp/nbsap_guidelines/

statistics on ABS activities. Where experience and concrete information is lacking, pilot projects may be crucial to enabling cross-sectoral integration of ABS.

Furthermore, key programmes, ministries, departments, and individuals may be unwilling to co-ordinate their activities, given differing institutional priorities, terms of reference and project timetables. In the past, lack of institutional co-ordination has stood in the way of effective strategy by allowing duplication, inefficient resource use, and inconsistent outcomes. By diluting government leadership, failure to co-ordinate can allow a strategy process to lose momentum, especially over implementation. An appropriate institutional framework is therefore fundamental to an ABS strategy process (GEF, 2000; WRI/IUCN/UNEP, 1995).

While an interagency committee (as described in Section 2.1), may provide a partial solution, mainstreaming ABS into parallel policies and programmes requires sustained efforts at awareness-raising, negotiation and consensus building amongst stakeholder groups, well beyond the scope of a 1 or 2 year planning process.

2.5 Choosing a suitable framework for the strategy

Having identified the scale and scope of the ABS strategy, it is important to choose the most appropriate framework for the strategy process. The alternatives are either to:

- create a self-contained ABS strategy, bridging a range of laws, policies and programmes;
- or to develop an ABS component within an existing sectoral or cross-sectoral strategy or plan.

There are a variety of legal and policy initiatives that have the potential to accommodate an ABS strategy as an integral component, or which a self-contained ABS strategy would need to draw on.

(i) *Legal initiatives*

The most obvious legal initiatives relevant to an ABS strategy are processes to develop ABS and/or biodiversity laws, in particular where these involve stakeholder consultations. Such processes could be expanded to cover the issues discussed in this manual. Other legal initiatives relevant to ABS include those addressing wildlife, intellectual property rights (including laws governing plant variety rights, and the protection and use of indigenous knowledge), access to information, rights to participate in decision-making, decentralisation and land reform. Appendix 2.3 provides examples of consultative processes to develop ABS and biodiversity laws, as well as of IPR regimes with provisions on access.

(ii) *Policy initiatives:*

- **Biodiversity:** National Biodiversity Strategies and Action Plans (NBSAPs) (Several CBD COP Decisions call for the inclusion of biodiversity strategies within NBSAPs, and GEF Enabling Activity funding is currently available to address ABS capacity building within the scope of NBSAPs).
- **Sustainable development:** National Sustainable Development Strategies (NSDSs) (see www.nssd.net), National Environmental Action Plans (NEAPs), National Conservation Strategies (NCSs), National Agenda 21s, Local Agenda 21s, Local Environmental Action Plans (LEAPs), Desertification Action Programmes, National Forest Programmes and protected area management plans.
- **Economic development:** five-year plans; structural adjustment plans (World Bank Comprehensive Development Framework, IMF); policies on enterprise development, development cooperation, competitivity, export promotion, employment, etc..

- **Science and technology:** technology foresight initiatives, biotechnology strategies, national and institutional policies on technology transfer and management.
- **Healthcare:** national health strategies, primary healthcare programmes, integrated healthcare initiatives.
- **Agriculture and fisheries:** sustainable agriculture and fisheries plans, plant breeding and biotechnology strategies and plans.
- **Indigenous affairs**: strategies for protection and use of local and indigenous knowledge, e.g. as is currently being developed in Peru (Swiderska, 2001).

Appendix 2.4 provides examples of national policy initiatives that have accounted for ABS, specifically: National Biodiversity Strategies and Action Plans; technology foresight programmes; and biotechnology strategies.

Irrespective of whether an ABS strategy is developed as a component of an existing initiative, or as a self-contained strategy, it will need to address an equally broad range of sectors, as described in Section 2.4. For example, although Bolivia incorporated ABS into its National Biodiveristy Strategy and Action Plan (NBSAP), the strategy team looked to a variety of other policies and laws when developing this component, as illustrated in Figure 2:

Figure 2: Policies and laws addressed during the development of Bolivia's NBSAP component on ABS

Policies and laws	Responsible Institutions
Regulation implementing Andean Pact Decision 391 on access to genetic resources and benefit-sharing	Biodiversity Directorate General (DGB) under the Ministry for Sustainable Development
Protected Areas: - Master Plan and Development Strategy for Protected Areas.	National Protected Areas Service (SERNAP)
Agriculture: - National Policy on Agricultural and Rural Development. - System for the Conservation of Genetic Resources for Food and Agriculture (proposed). - Bolvian System for Agricultural Technology.	Ministry of Agriculture and Rural Development
Scientific and Technology (including biotechnology) - Strategy for the Transformation of Plant Resources; - Proposed Law on the Promotion of Science, Technology and Innovation - National Strategy on Biosafety - Regulation on Biosafety	National Council for Science and Technology (CONACYT) and National Academy of Sciences Biodiversity Directorate General (DGB) under the Ministry for Sustainable Development
Health (natural products): - Strategic Plan on Health; - Regulation on Natural-Traditional Medicinal Practices; - National Programme on Essential Medicines; - Draft Norms for Natural, Traditional and Homeopathic Medicines.	Ministry of Heath and Social Provision

2.6 Managed participation

Actors involved in ABS have widely differing needs and priorities. Stakeholder participation is therefore essential to the entire process of designing and implementing ABS laws and policies including appropriate benefit-sharing mechanisms. A participatory strategy process helps to communicate and mediate these differing priorities. It captures stakeholder insights into obstacles, solutions and future direction (Glowka, 1998; UNEP/CBD/COP/4/23; Swiderska, 2000). It provides a means to tap into institutions and networks that can support implementation. And by building stakeholder confidence, it might have the long-term effect of reducing the transaction costs (protracted legal negotiations) so often associated with applications for access (WRI/IUCN/UNEP, 1995; Carew-Reid, 1994). Box 2 below illustrates the range of stakeholders that should be involved in the development and implementation of an ABS strategy. This spans

both stakeholders who will be affected by the outcome, as well as those whose involvement will be necessary to implement a strategy.

Box 2: Potential stakeholders in access to genetic resources and benefit-sharing

- ***Ministries and government agencies (national, provincial, municipal)***: economic and sustainable development planning, environment, agriculture, health, science and technology, protected areas, wildlife, forestry, fisheries, IPRs, customs and justice - *set law and policy affecting conservation, access to and use of genetic resources and associated knowledge*;
- ***Foreign and domestic industries***: biotechnology, pharmaceuticals, crop breeding, horticulture, botanical medicines, cosmetics and fragrances, and food processing - *seek access for discovery and development of products based on genetic resources and traditional knowledge* [see footnote at bottom of box and Appendix 1.1];
- ***Industry representatives and chambers of commerce*** - *sources of information on markets for products derived from genetic resources and, and contacts for industry representatives to participate in the design and implementation of access law and policy*;
- ***Foreign and domestic scientific research institutions***: crop development, taxonomy, biochemistry and pharmacology - *seek access for taxonomic and other academic research; some act as intermediaries in the commercial discovery and development process* [see footnote at bottom of box];
- ***Ex situ conservation centres***: botanic gardens, zoos, museums, germplasm banks (crop, agroforestry and forestry), and microbial collections - *inventory, characterise, conserve and may provide genetic resources and associated knowledge*;
- ***In situ conservation initiatives***: protected areas and community-based conservation projects for agricultural and wild biodiversity - *conserve and provide access to genetic resources and associated knowledge*;
- ***Indigenous and local communities*** - their representative organisations, and individuals within them - *conserve and provide access to genetic resources and associated knowledge; they are also users of these resources for local subsistence (e.g. nutrition, health) and trade*;
- ***Traditional healers' associations*** - *sources of information on uses of and local markets for medicinal plants and associated ethnobotanical knowledge, and contacts for organising community participation in the design and implementation of access law and policy.*
- ***Producers' associations*** - e.g. farmers' and foresters' associations - *sources of information on uses of and local markets for genetic resource and associated knowledge used in agriculture, forestry etc.*; *and contacts for organising community participation in the design and implementation of access law and policy.*
- ***NGOs and community-based organisations***: health care, community-based conservation, microenterprise initiatives and agricultural development - *work with local communities to conserve and use genetic resources and associated knowledge*; *and to advise on ABS policy and partnerships.*
- ***Donors and environmental investment funds***. - *mechanisms to fund the ABS strategy process, as well as to support sustainable use and benefit-sharing initiatives, e.g. micro-enterprise ventures developing products based on genetic resources and local knowledge.*

Source: adapted from UNEP/CBD/COP/4/23 (paragraph 22), and UNEP/CBD/WG-ABS/1/2 (paragraph 84).
Note: To some it may seem strange to include foreign scientists and companies as stakeholders in a country's ABS strategy. Naturally, the government over each country has sovereignty over its natural resources and will determine access to genetic resources. However, many governments hope that scientists and companies within the country will be able to establish beneficial international partnerships with counterparts around the world. One of the objectives of access regulations is to regulate and enable this, and one of the groups affected by the regulations are scientists and companies overseas. For this reason, it may be helpful for countries to seek their views as part of the strategy process. The national strategy can either accommodate or ignore these, but would at least be informed.

Participation plays a role in all phases of an ABS strategy process: assessment, strategy formulation, action planning and implementation (including monitoring, evaluation and feedback). This requires long-term commitment on the part of stakeholders. So with each group of stakeholders consulted, it may be important to:

- clarify who wants to be involved;
- clarify their expectations of the process and what each wants to contribute;
- agree on the methods and responsibilities for information collection and analysis;
- agree on priorities and indicators for monitoring and evaluation of implementation;
- agree on how findings are used and by whom; and,
- clarify how the process will be sustained (IDS, 1998).

To enhance stakeholder 'ownership', an ABS strategy will also have to look beyond more passive forms of participation (e.g. information distribution and gathering), to processes whereby stakeholders are actively involved in agenda-setting, consensus-building and decision-making.

Box 3: Forms of participation in a strategy process

1. ***Information distribution***: one-way information flow where participants listen, e.g. to a government PR campaign;
2. ***Information gatherring***: participants answer questions posed by extractive researchers using questionnaire surveys;
3. ***Consultation***: a two-way information flow, where participants listen and give their views, e.g. through public enquiries.
4. ***Analysis and agenda-setting***, e.g. through multi-stakeholder groups, round tables and commissions.
5. ***Consensus-building on the main strategy elements (negotiation)***: e.g. through national roundtables, participatory committees and conflict mediation.
6. ***Decision-making on the strategy or its components***.

Adapted from Pretty (1995), Swiderska (2001), and Laird & Noejovitch (2001).

ABS is, however, a highly technical area and some stakeholder groups, in particular local and indigenous communities, may not at first comprehend the issues at stake in relation to their own interests. Furthermore, building consensus amongst providers and users of genetic resources, and developing trade-offs between their widely differing priorities, can be difficult and highly politicised. The controversy surrounding two International Co-operative Biodiversity Group projects in Mexico (ICBG Maya) and Peru (Appendix 4.1) illustrates the sensitivities involved. In both cases, the concerns of indigenous communities proved very hard to reconcile with the interests of researchers and business, not least because of difficulties in defining the relevant communities and in identifying their representatives.[9]

Building awareness and mutual confidence amongst stakeholders, and working towards consensus and political 'buy-in', may therefore require lengthy dialogue and negotiation, especially where the diversity and number of stakeholders is high. If the process is not carefully managed, stakeholders may begin to suffer 'participation fatigue'. The key is not to be over-ambitious. As recommended in Section 2.1, a strategy team could initially develop an initial strategy, involving a select through representative group of stakeholders. Experimentation is a good alternative to bogging a process down in endless dialogue (Meyers and Bass, 1999). If a small-scale, initial strategy were developed and implemented alongside closely-monitored ABS partnerships, stakeholders would have the opportunity to explore each others' concerns, as well as ways of working together, i.e. 'learning by doing'. The experience gained might leave a country in a stronger position to develop a comprehensive national strategy in the future. An experimental approach must, however, not compromise the rights of stakeholders such as local and indigenous communities.

Took Kit 1 outlines a range of tools to support stakeholder participation in the strategy process.

[9] Pers. comm. Sarah Laird, 2 April 2001.

2.7 Adequate finance and capacity to manage the strategy process

2.7.1 Financing the strategy process

Adequate financing for the strategy process is essential, not least because sustained participation of stakeholders can be costly. Argentina used most of its NBSAP budget on stakeholder consultation processes. On the other hand, costs need not escalate. For example, South Africa's Biodiversity White Paper (which includes provisions on ABS) was developed with a budget of US$90,000, and the process was well managed and thorough. (Wynberg & Swiderska, 2001). Governments will also need to explore options for long-term financing of implementation, monitoring, feedback and adaptive management. In the past, lack of funding has prevented full implementation of ABS measures in both the Philippines and Bolivia. The GEF recognises that nearly all countries now face an equivalent problem with their NBSAPs (GEF 2000). Appendix 2.5 outlines possible funding solutions.

2.7.2 Capacity to manage the strategy process

Initiating and managing an ABS strategy may require substantial capacity-building at several levels and at various stages of the process, including individual lead agencies, interagency committees, provincial and local steering committees, the strategy team itself, and stakeholder groups involved in participatory monitoring and evaluation of implementation. Institutions may require administrative capacity to cope with 'nuts and bolts' issues such as communications, decisions flows, memoranda and document-tracking for the strategy process (Brinkerhoff, 1995). Individuals may not understand the synergies between ABS and their own institutional mandates, and will require training in access issues, including international policy, information on markets and demand, the various sectors involved, and case studies of individual partnerships, national regulations and NBSAP components.

PART 3 - ASSESSMENT

As outlined in Section 1.3 and illustrated in Figure 1, the strategy process can be broadly divided into an assessment phase (knowing were you stand) the formulation of a strategy (defining where you want to be), action planning (laying out how you will get there) and implementation, including monitoring and evaluation (carrying the action plan through and assessing its successes and failures). Part 3 addresses the assessment phase, including assessments of genetic resources and associated information, the legal framework, and people and their organisations (their capacities).

An ABS strategy is created from the raw materials of biodiversity, people and knowledge. The first step is an assessment of these resources and how they interrelate. This need not be exhaustive, but sufficient to help identify the partnership opportunities available to the country and ensure that the ABS strategy is realistic, addresses the needs identified by stakeholders, and is properly mainstreamed into all relevant strategies and plans within the country.

The strategy will need sufficient information to be able to determine:

- whether the country's biological diversity and human and institutional resources are likely to be able to contribute to meeting national priority needs in terms of food security, primary healthcare and sustainable livelihoods;
- whether the genetic resources comprise sufficient diversity and/or uniqueness to be attractive to researchers from academia or industry to seek access to them and thus offer benefits in return;
- what might be the 'unique selling points' to attract value-added partnerships;
- whether the providers of genetic resources and associated knowledge wish to embark on such partnerships, based on domestic and international experience of ABS partnerships.
- whether the biodiversity is sufficiently protected that it will be available to meet future needs and the common requirement by bioenterprise for reliable resupply of original material;
- whether traditional knowledge on genetic resources and their uses is thriving or dying out with the oldest citizens; whether it has been or is being recorded with the involvement of individuals and communities; and whether this knowledge is in the public domain or still known to very few;
- the nature of information generated in the formal research sector from research on biodiversity, how it is recorded and whether this knowledge is in the public domain or still known to very few;
- what are the major gaps in information that will need to be filled by more detailed surveys and inventories in the future; and,
- national technical and technological capacities needed to enagage in beneficial ABS partnerships.

Working directly with stakeholders can help the strategy team assess available resources, current demand for and use of genetic resources and associated information, priorities for domestic stakeholders, what foreign partners are looking for and opportunities. This section addresses the issues to explore with stakeholders, summarised in Box 4.

Box 4 Issues to be addressed during the during the assessment phase

1. ***Genetic resources and associated information*** (section 3.1)
2. ***Legal and policy regimes related to access and benefit-sharing*** (section 3.2)
3. ***People and organisations – their needs and capacities*** (section 3.3)
   - Domestic stakeholders (section 3.3.1)
   - Foreign stakeholders (section 3.3.2)

Questions to ask stakeholders on each of these issues are listed in Tool Kit 2.2 – 2.4 These questions can be addressed in a number of ways, ranging from questionnaires for completion, to open discussion in a workshop. See Tool Kit 1 for tools to work with stakeholders.

In addition, useful information on all these points may be found in a range of literature within the related sectors (e.g. health, agriculture, forests, indigenous affairs, markets, etc) and in a growing, specialist literature that focuses on ABS. Tool Kit 2.1 offers useful references.

3.1 Genetic resources & associated information

An ABS strategy may be able to draw on a range of existing assessments of the level and status of biodiversity in a country for an assessment of genetic resources and associated information.

A country may have contributed information to a variety of global biodiversity assessments. Some of these are listed in Appendix 3.1. Countries could therefore access data from resulting publications and databases maintained by institutions such as FAO (e.g. the database FISHBASE) and the World Conservation Monitoring Centre.

Countries may also have prepared national biodiversity assessments for a range of initiatives, which an ABS strategy processes could both draw on and to feed into. These include:

- NBSAP processes;
- National Reports to the CBD (in line with Art. 26 of the Convention). Many countries have now completed their first National Reports and have been requested to submit their second by 15 May 2001 for consideration at COP6. In addition, countries have been requested to submit thematic reports on benefit-sharing, alien species and forest ecosystems.
- National reports to other Conventions such as Ramsar, CITES, CMS and World Heritage.
- UNEP Country Studies.
- The CBD Programme of Work on Agricultural Biodiversity, specifically Programme Element 1 – an assessment of the status and trends of the world's agricultural biodiversity and their underlying causes, underpinned by country-driven assessments of agricultural genetic resources.[10]
- Forest assessments for Tropical Forest Action Plans (TFAPs) and national forest programmes (nfps).

Some countries, such as Australia,[11] Costa Rica (Appendix 3.2) and Namibia,[12] are developing consolidated national biodiversity inventories. In most cases, however, national inventories consist of a patchwork of databases and publications on specific aspects of biodiversity – for instance floras and checklists of a country's higher plants, or surveys for particular ecosystems and protected areas (e.g. as conducted by Conservation International's Rapid Assessment Programme in countries such as Bolivia, Madagascar and Indonesia[13]).

It would also be useful for an ABS assessment to identify which institutions outside the country hold *ex situ* collections of its genetic resources, and the scale and nature of these collections. From the point of view of countries acting in their capacity as providers of genetic resources, the answer may have a bearing on whether potential users seek access to genetic resources in the country itself, or from collections held elsewhere). A provider country may also be able to identify how much traditional knowledge associated with biodiversity already exists in the public domain. Traditional knowledge may, for example, be available on international databases, in individual publications (e.g. reports of ethbotanical surveys and information associated with herbarium specimens), as well as in community 'biodiversity registers' (see Appendix 3.3).

[10] www.biodiv.org/agro/Assessment.html.

[11] Pers. communication Dr Martin Jenkins, WCMC, 18 January 2001.

[12] The National Biodiversity Inventory Programme - www.natmus.cul.na

[13] See Conservation International Rapid Assessment Programme - www.conservation.org

Countries acting in their capacity as users of genetic resources should consider assessing the collections they already hold from outside the country. How they choose to handle access to these collections and the sharing of benefits arising from their use may have a bearing on their ability to access genetic resources in the future.

Data concerning the origin and potential uses of genetic resources can add considerable value to them. Indeed, specimens without the minimum 'passport' data are often valueless to scientists. Biodiversity registers and integrated biodiversity databases are likely to attract partners, to support value-addition, to help protect intellectual property rights and thus to support a country's competitiveness.

Although most countries have conducted biodiversity assessments of some kind, there will inevitably be taxonomic groups, geographical areas and groups of people whose knowledge of biodiversity are poorly documented. Many techniques exist for conducting surveys and inventories, ranging from relatively speedy methods of assessment such as participatory rural appraisal, to lengthy inventories such as monographs and floras which can take several decades to complete. Tool Kit 2.5 highlights publications that provide guidance on conducting biodiversity assessments, and on managing the information gathered.

3.2 The legal and policy framework

Before access can be granted and benefits shared appropriately, the legal rights over genetic resources must be clear. From which government department(s) must permission for access be sought, if any? From which individuals and groups in civil society – landowners, local and indigenous communities, protected area management boards, etc. – must prior informed consent be sought? It is rare for countries to be able to answer this unambiguously, yet it is essential for legal access and benefit-sharing arrangements. A review of the current legal situation and identification of areas that require clarification is thus an important part of the assessment phase of an ABS strategy.

Countries have chosen to exercise their national sovereignty over genetic resources and require prior informed consent (or not, as the case may be) in many different ways. In most countries, access to genetic resources is governed by a patchwork of different national and state laws concerning access to protected areas, collection of specimens in various other geographical locations, scientific research, export, CITES, phytosanitary provisions, biosafety, the laws of private property, and the rights of local and indigenous communities. These laws often overlap, but also often reveal important 'gaps' - such as no regulation of access to microorganisms or to marine resources (ten Kate, 1999).

In practice, identifying the appropriate organ or organs of government from whom consent must be sought is often extremely difficult. In China, for example, at least 7 different government departments have some jurisdiction over access to genetic resources. In Australia, there are some 40 different legal regimes governing collecting permits in different states and territories and at the Commonwealth level. While some 50 countries are exploring potential measures, the majority of countries have yet to take legal, policy or administrative steps to clarify access to genetic resources in the light of the CBD.

In addition to prior informed consent from government, national law often requires the consent of other individuals and organisations such as local and indigenous communities, private landowners, protected area management boards and *ex situ* collections. It can be quite a challenge – particularly for foreigners who are neither anthropological experts nor conversant in local languages or customs – to identify who owns particular land or from which communities (and the individuals within them) consent should be sought. Traditional communities may not

have the capacity or the experience to negotiate ABS agreements, and frequently require time to conduct their own internal consultations.[14] Furthermore, such communities may lack the necessary land and resource rights for effective PIC and benefit-sharing. Appendix 4.1 provides examples on the complexities of obtaining PIC from local communities. Useful source material on working with local communities to negotiate terms and conditions for access and benefit-sharing is available in Laird, S. A. and F. Noejovich, *Building Equitable Research Relationships with Indigenous Peoples and Local Communities: Prior Informed Consent and Research Agreements*, in Laird, S. A. (2001), Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice, Earthscan, London.

Clarifying from whom prior consent is required might help with the preparation of the strategy itself. First, it can help to secure participation in the strategy process, and ensure that the need to obtain consent and to share benefits is reflected in the strategy. Second, it can help identify any gaps in the legal framework that need to be plugged, including the property rights of local and indigenous communities. The strategy may therefore be able to inform the preparation of access legislation or regulations, whose purpose is not regulation for its own sake, but rather to promote benefit-sharing and ensure rights are respected. An ABS strategy might also consider how the government could help to guide applicants through procedures for obtaining prior informed consent. This help may be needed on a case by case basis, particularly where communities' rights are involved.

Tool Kit 2.2 lists questions to assist in the assessment of legal regimes related to ABS. The questions should be posed both to describe the *status quo* and to identify any needs for additional laws or interpretative statements to clarify the rights and responsibilities of the state and other stakeholders with respect to access.

An assessment will also need to review the relevant policy framework. Several areas of policy affecting ABS are described in section 2.5(ii) and Appendix 2.4.

3.3 People and organisations: their capacities and needs

Having identified the genetic resources, associated information, and the status of rights over these, the missing element of the resource base for an ABS strategy is an understanding of how people and organisations – both within the country and externally – are currently using genetic resources and associated information, and how they can contribute to conservation and sustainable use.[15] When it is formulated, the strategy will match these capacities with the needs of the same stakeholders in terms of both their demand for access to genetic resources and associated information, and their priorities for benefits that could be shared in exchange for access (see section 4.4.5 below). Since the same people and organisations are involved, the interviews, questionnaires and workshops used to conduct the assessment of institutional capacity can also cover the assessment of needs.

3.3.1 Domestic stakeholders

There are three main target groups within the country:
(1) communities: local and indigenous communities, farmers, traditional healers and their associations and representatives;
(2) the public sector: including central, regional and local government departments and agencies, and public research institutions.

[14] Pers. comm. Anna-Maria Hernandez, Instituto Von Humbolt.

(3) the private sector: including for-profit enterprises, research institutions and foundations.

These categories are chosen for simplicity and convenience and sometimes overlap. For example, there are entrepreneurs and microenterprises within communities, and the public sector can be involved in commercialising genetic resources. The strategy team can therefore work with mixed groups (e.g. those involved in the commercial use of genetic resources, including representatives from all three target groups), or can work with each target group separately, being sure to ask questions that cover work on livelihoods, formal and informal research and commercialisation with each group. Logistically, it may be easier to consult the target groups separately at this stage. Consulted in a group of peers, common capacities and experiences may become clear, and the groups may be able to articulate their needs without fear of contradiction by other kinds of organisation that may see ABS in a very different way. The different groups of stakeholders can be brought together later in the strategy process.

Another important aspect of the assessment is to establish stakeholders' priority needs that might be met through ABS partnerships. This can be revisited in more detail at the strategy-setting stage. Tool Kit 2.3 lists questions to assist in the assessment of domestic stakeholder – specifically capacities, needs, current demand for access and benefits obtained in return.

3.3.2 Foreign stakeholders[16]

There are two sides to an ABS partnership: demand for access and the ability to provide it. To date, countries have tended to formulate access regulations based on a number of assumptions, particularly about the demand for access by foreign stakeholders such as universities, botanic gardens and companies for access to genetic resources, how they use genetic resources and associated knowledge and the kind of benefits that are likely to arise and be available for sharing. Assessing likely future demand for access is tricky at the best of times. See Sections 1.1.2, Box 5 below (from ten Kate and Laird, 1999) and Appendix 1.1

A good start is to ask some of the country's existing and potential overseas partners what they are looking for and what would attract them to collaborate with stakeholders within the country. These foreign stakeholders include:

- universities, botanic gardens, herbaria, genebanks, zoos, museums and research institutes working with domestic counterparts on a range of conservation, research and development work involving access to genetic resources
- companies obtaining genetic resources, associated information and derivatives from communities, public and private organisations for research and development.

[16] To some, it may seem strange to include foreign scientists and companies as stakeholders in a country's ABS strategy. Naturally, the government over each country has sovereignty over its natural resources and will determine access to genetic resources. However, many governments hope that scientists and companies within the country will be able to establish beneficial international partnerships with counterparts around the world. One of the objectives of access regulations is to regulate and enable this, and one of the groups affected by the regulations are scientists and companies overseas. For this reason, it may be helpful for countries to seek their views as part of the strategy process. The national strategy can either accommodate or ignore these, but would at least be informed.

Box 5 Demand for access amongst foreign commercial stakeholders
Evidence from a survey of 300 interviewees from 7 industry sectors.

There is great variety - both within and between industry sectors and the research community - in the nature and demand for access to genetic resources, the kind of research conducted, and potential benefits. Thus demand for access is not uniform. Broadly speaking however, two main areas are likely to determine whether commercial demand for access will increase or decrease in the future: developments in science and technology, and trends in law and policy.

Science and technology:

There are two schools of thought here:

1. **DECREASING DEMAND:** Some companies feel demand for access will **decrease** due to the following:
- **Alternative approaches:** Developments in science and technology favour alternative approaches to product discovery and development such as combinatorial and synthetic chemistry, and biotechnology involving human genes rather than 'natural products' which rely on access to plants and microorganisms.
- **Fewer samples are sought:** Companies in the pharmaceutical, biotechnology, botanical medicine and personal care and cosmetics sectors now generally seek a focused and targeted selection of a relatively small number of samples, based on specific chemotaxonomic or biorational leads, in order to fill gaps in existing collections, rather than large-scale, random collections common in the 1980s.
- **Samples taken from existing collections:** Demand for access to genetic resources may decline because of the increasing use of materials from existing, *ex situ* collections (whether in-house corporate collections or from external institutions such as botanic gardens or culture collections).

2. **INCREASING DEMAND:** However, some companies feel demand for access will **increase** because:
- **New tools:** developments such as genomics and bioinformatics facilitate the exploration and use genetic resources and will inevitably lead to higher demand for access.
- **Consumer demand for 'natural' products:** in fields as diverse as cosmetics, medicine, crop protection and waste treatment, the growing attraction of 'natural' alternatives to synthetic chemicals is spurring the investigation of unexplored organisms which may increase demand for access.

Legal and policy environment

A large majority of the companies and other organisations interviewed report that law and policy on access is currently deterring partnerships with industry. If future developments continue along the same vein as recent laws, the demand for access to genetic resources is likely to decrease.
- **Lack of clarity, legal uncertainty, and excessive bureaucracy:** Lack of clear procedure or authority for providing access creates considerable uncertainty and risk, not only for companies and intermediaries, but for governments and institutions in provider countries. Such uncertainty, and the cost and time currently required to secure access will be sufficient to deter most companies that would be prepared to negotiate in good faith. This problem is presented by companies as the fundamental reason why demand for access to genetic resources is likely to decrease in the future.

CONCLUSION: On balance, there was broad agreement that developments in science and technology will change the nature of demand for genetic resources, and that private sector demand is likely to continue at current levels, and in some sectors, may even increase. At the same time, however, many companies believe that the legal and policy climate could decrease demand.

Existing and potential overseas partners can be identified by 'co-nomination', see above, as well as by questionnaires and literature surveys. Much can be learned about demand for access and current practice in benefit-sharing from domestic stakeholders, so it may be helpful to conduct the in-country assessment before contacting the foreign stakeholders.

Tool Kit 2.4 lists questions to assist in the assessment of foreign stakeholders.

PART 4 – FORMULATING AN ABS STRATEGY

The key stages in formulating a strategy are:

- creating a shared vision
- identifying the country's 'business idea' or 'core strategy for success'; and
- formulating elements of the strategy.

Part 4 will deal with each in turn. First, it will discuss managing in the face of uncertainty (Section 4.1) – one of the main challenges for formulating strategy in the area of ABS. Then it will introduce some techniques to help with each stage of formulating an ABS strategy (Section 4.2).

4.1 Managing in the face of uncertainty

If the future were predictable and linear, it would be easy to create an ABS strategy. The challenge comes from figuring out where to go in a very complex, rapidly changing and unpredictable world. Much literature on business strategies involves coping with uncertainty. Several methods used for managing uncertainty may be relevant for ABS, where it is difficult to predict future demand for access, to identifying beneficiaries and prioritise benefits. How much demand for access to genetic resources is there, and is this demand likely to grow or dwindle in the short, medium and long term? (Some evidence on this question is described in Box 5, page 24). How can all those stakeholders whose PIC is required and with whom benefits should be shared be accurately and exhaustively identified, so that benefits are shared with them? Which benefits will underpin a country's long term competitiveness?

Despite the uncertainties involved, a response to the likely range of future **demand for access** is important for the ABS strategy, because upon it depends the significance of ABS partnerships as a tool for sustainable development and the most appropriate means of regulating access. Without a rough idea of the magnitude of the benefits likely to arise from ABS agreements (including benefits from the opportunity to participate in value-adding research as well as the chance of windfall payments from royalties), it would be difficult for strategists and planners to decide on a number of questions. For example, how elaborate a system of access regulation should be introduced (and how much should be invested in its administration and enforcement) and whether to operate a simpler process with more modest benefit-sharing expectations from academic access applications compared with commercial ones. How wide should the training programme for people both to negotiate and participate in ABS arrangements be? (For example, should an outreach programme ensure that each indigenous community has the opportunity to be trained in negotiating ABS agreements, or is the demand for access to traditional knowledge so modest that it would make more sense to train a group of independent indigenous 'negotiators' who could work with all communities.)

4.2 Techniques to help strategic thinking

Box 6 introduces a number of different methods used in the corporate sector to support strategic thinking, including techniques for handling uncertainty and managing change and illustrates the different phases in the strategic process at which these methodologies could be most helpful. What these techniques involve and how they could be applied to ABS strategy are explained in Tool kit 3.1 – 3.8.

Box 6 Techniques to help strategic thinking

METHODOLOGY	Creating a vision and setting your objectives	Formulating strategies		
		Strategy formulation	Modelling uncertainty	Evaluation and selection of strategies
Balance scorecard	x	x		x
Visioning	x	x		
SWOT		x		x
STEEP		x		x
Five forces		x		
Scenario planning		x	X	x
Cognitive mapping	x	x	X	
DELPHI				

The key stages in formulating a strategy are:

- creating a shared vision
- identifying the country's 'business idea' or 'core strategy for success'; and
- formulating elements of the strategy

4.3 Creating a shared vision

The first step in creating an ABS strategy is to formulate a shared vision. Once all the stakeholders have discussed what they wish to achieve by preparing an ABS strategy, their shared vision can be captured in a succinct mission statement of the strategy's purpose. This is the goal to which all stakeholders subscribe and which describes the situation everyone wants to find themselves in, once the strategy has been implemented. Reaching agreement among stakeholders is always difficult, but the shared vision is intended to be inclusive, and does not delve into the means to achieve it. Not all stakeholders will necessarily come to the process convinced that the country should promote ABS partnerships. Some may have concerns about their fairness and whether they are truly in the national interest. Such concerns should be discussed thoroughly and an inclusive vision formulated. This might, for example, promote only such partnerships that guarantee the protection of rights and integrate equity considerations.

Defining the vision limits the range of strategic choices that will need to be evaluated and therefore helps to simplify the development of the strategy. The best mission statements are detailed and focused and give long-term, directional stability without pushing the country into seeking unrealistic goals, (Campbell and Alexander, 1997). The challenge is get a good mixture of stakeholders to craft a mission statement that is at once succinct, yet sufficiently precise to give a clear picture of the desired future and the key elements of the strategy. A mission statement that states 'the objective of this strategy is to regulate access and obtain a fair share of benefits' offers very little information and could frankly be substituted by the phrase 'the objective of this strategy is to achieve the objectives of the CBD'. By contrast, a more helpful mission statement may be 'to ensure prior informed consent, empower the country's communities and scientists to conserve and use biodiversity sustainably and promote partnerships that obtain benefits identified as priorities for the country, supported by the simplest possible system for regulation of access'.

A range of techniques lend themselves to gathering and analysing the information and different perspectives needed to create a statement of mission or purpose. These include tools for group discussion with stakeholders, e.g. matrix scoring, nominal group technique and guided imagery (see Tool Kit 1.3), as well as tools to create strategy, e.g. visioning and cognitive mapping (Tool Kit 3.2 and 3.6). These techniques can help groups to tease out the priority issues for the country

and its stakeholders and thus to formulate an inclusive vision. Each aspect will need to be examined further in the next stage, which is to formulate the country's 'business idea', or 'strategy for success'.

4.4 Business idea/ core strategy for success

What will enable a country to achieve its vision for the ABS strategy and be successful in the future? The answer to this question is the core of the strategy itself and will involve:

- establishing a **balance between competition and cooperation** (section 4.4.1).
- building the country's **competitive advantage & distinctive competencies** (explored in section 4.4.2); and

This section considers some factors can help achieve this under the following headings:

- creating a conducive legal and policy framework (sections 4.4.3 and 4.4.4)
- matching domestic needs and priorities with the benefits available (section 4.4.5)

4.4.1 Competition and cooperation

Corporate strategists tend to formulate the 'business idea' in competitive terms, namely 'what are the unique factors that allow this company to exploit this competitive advantage, and why are others unable to emulate it?' (van der Heijden, 1996) In many ways, a national strategy on ABS does not need to be ruthlessly competitive. Just as with business, there may be good reasons to cooperate with other countries, particularly those with a shared resource base, common borders, or similar levels of economic development. Some commentators have discussed the possibility of 'gene co-ops' or 'cartels' to avoid undercutting and maximise on opportunities of cooperation such as economies of scale and pooled technology, human resources and information. (Reid, 1995, ten Kate 1995, and Vogel 1996). There are several examples where governments have discussed the benefits of cooperation on access regionally or multilaterally (see Appendix 4.2)

The strategy team should consider the benefits of cooperating with other countries, particularly neighbours, during the formulation of the ABS strategy, particularly if any of the following are applicable:

- shared genetic resources;
- free trade areas (free movement of people, goods and services);
- trans-boundary protected areas;
- possibility of lowering transaction costs by harmonising access regimes; and,
- preventing 'undercutting' of the 'price' for genetic resources and value-added products by neighbouring suppliers.

Discussions with neighbouring countries could lead to measures that could be included in the strategy, including regional regulation of access to genetic resources (e.g. Andean Commission; ASEAN) and regional capacity building (e.g. shared technology, costs of market research, training for stakeholders on prior informed consent, shared costs of market research).

Naturally, however, a strategy will need to consider competitiveness at the national level. Cooperation will sometimes but not always support this. Genetic resources and their derived products are bought and sold in markets, and the potential supply of genetic resources for product discovery and development currently outstrips demand. Competition among suppliers is needed to survive in any market place, particularly in the case of genetic resources where supply generally outstrips demand. If part of the shared vision for the ABS strategy is to supply genetic resources and derived products to domestic and foreign markets, the strategy will need to address competitivity, or domestic users will buy cheaper or better quality foreign products, and foreign users will turn to other countries to obtain genetic resources and derived products. To do

this, the strategy should examine the need of both commercial and non-commercial users of genetic resources.

Requirements for competitiveness by industry. A recent survey of users of genetic resources from 7 industry sectors shows that users of genetic resources choose to work in countries which can meet a fairly consistent list of criteria. (ten Kate and Laird, 1999) These include:

- Quality & biological diversity of samples
- Scientific calibre of partners
- Competitive cost per sample
- Ease of obtaining necessary permits/agreements
- Confidence in ability of provider to resupply further samples

Requirements for competitiveness for non-commercial uses (including research for conservation, systematics and education by universities, museums and botanic gardens). To be able to work within available budgets and project cycles, scientists conducting non-commercial research need:

- Clarity on whether it is they, as collectors, who must obtain permits, or whether counterpart in-country partner institutions can or must do this on their behalf
- Simple and unbureaucratic systems for obtaining permits or access and benefit-sharing agreements that can be accomplished in minimal time
- Acknowledgement of the kind of benefits that academic and conservation institutions habitually generate and which can be shared (with more emphasis on the generation and sharing of information, skills, collections and capacity, rather than monetary benefits)
- Counterpart, in-country partner institutions which possess the scientific and technical skills and the manpower to prepare joint project proposals and to work collaboratively in the field and on subsequent research and publications.

4.4.2 Identification of 'Distinctive Competencies'

An important stage leading to the formulation of an ABS strategy is thus identification of the country's distinctive competencies. A country's competitive advantage in ABS may comprise a very diverse range of factors. As we have seen from the list of criteria which commercial and academic users consistently stress, core aspects of competitive advantage for countries providing access to genetic resources to users both from home and abroad are likely to be:

- High biological diversity (including ecosystem diversity, e.g. extreme environments), with a high endemic component.
- A good system of *in situ* and *ex situ* conservation that guarantees the survival and resupply of specimens.
- Scientific excellence and competent collaborators to work with in the country.
- Technological and institutional capacity in collaborating institutions to add value to genetic resources.
- Incentives for R&D and grassroots innovation, e.g. grants, support in securing IPRs.
- Incentives for local 'bioenterprise' development, e.g. soft loans and technical assistance.
- Legal certainty through unambiguous rights over genetic resources to lower the risk of users discovering that they do not have clear legal title to use genetic resources once they have already invested in research.
- Unbureaucratic and simple procedures for applying for access and obtaining permits or agreements to keep down transaction costs.
- Adequate infrastructure, including transport, energy and communication.
- Political stability and commitment in all departments to design and implement the strategy through collaboration.

In addition, many other factors can support competitive advantage. For example, knowledge of and responsiveness to the value systems and needs of users of genetic resources can be very influential in attracting partnerships. Those seeking access to genetic resources will be drawn to

countries where the government authorities and stakeholders involved in collecting and transferring genetic resources are familiar with and accommodating towards their priorities and needs. Companies, in particular, like to work with the partners with whom they can quickly 'talk business' without the need to explain background information on the nature of research and development and the *modus operandi* of the private sector.

Another factor supporting competitiveness is the influence that a given country can have on setting the 'level international playing field' through its contribution to international law, policy and strategy. Countries that engage in the international debate to shape the forthcoming intergovernmental guidelines on ABS[17] to meet their national circumstances are likely to have a competitive advantage in the international exchange of genetic resources in the future. Several NBSAPs highlight the strategic advantage for the governments concerned to influence developments on ABS under the CBD and the FAO. While more nebulous, reputation and image also undoubtedly influence a country's bargaining power in the negotiation of ABS partnerships (see Appendix 4.3).

The perception by potential partners of the reliability and trustworthiness of stakeholders and authorities in a country in terms of delivering scientific results and watertight ABS agreements can play an important part in securing partnerships. This is sometimes as much a question of image and good PR as the ability of the country genuinely to provide a better service than its competitors. Appendix 4.3 outlines how National Institute of Biodiversity (INBio) in Costa Rica has succeeded in projecting a highly successful image abroad as a reliable and experienced in-country partner, as well as meeting other criteria described in this section.

Investing in technological and institutional capacity building in the hope of increasing competitiveness can, however, be a high-risk strategy without secure domestic markets for products derived from genetic resources. Foreign markets for these products are unpredictable, and may demand both quality and quantity, which can be difficult targets for countries whose research, development and manufacturing capacities are constrained. The strategy team should bear in mind that investment in technological and institutional capacity is unlikely to improve competitiveness without also addressing other factors, such as legal certainty, unbureaucratic consent procedures, and incentives for 'bioenterprise' development (see Appendix 4.4).

A number of techniques can help a strategy team evaluate options for building competitive edge, including: balance scorecard, visioning, SWOT, five forces, scenario planning and cognitive mapping (Tool Kit 3.1 – 3.8).

4.4.3 Conducive legal framework

Following the current level of uncertainty in legal regimes on access described in section 3.2 and the emphasis placed by users on legal certainty, unbureaucratic regimes for access and adequate protection of property and other rights, it will be apparent that reviewing the current legal framework and addressing any perceived weaknesses is a very important element of an ABS strategy. An ABS strategy may thus contain elements that refer to introducing, amending and simplifying or strengthening a number of different kinds of law, such as:

- Access legislation
- Laws on land tenure and private property
- Laws on conservation and sustainable use
- Laws on biotechnology
- IPRs and *sui generis* regimes

[17] A Working Group established by the 5th meeting of the CBD Conference of the Parties to the CBD will meet in October 2001 to develop "Guidelines and other approaches . . .to assist Parties and stakeholders in addressing . . . elements . . . relevant to access and benefit-sharing" (See Decision V/26, paragraph 11 in UNEP/CBD/EP-ABS/2/2).

The first meeting of the Expert Panel on Access to Genetic Resources and Benefit-Sharing had much to say on the subject of effective legal regimes on access. The Panel called for flexibility, legal certainty and clarity (UNEP/CBD/COP/5/8 para. 151 & 152).

Box 7: The need for flexibility, legal certainty and simplicity: common complaints amongst access applicants:

- problems identifying government officials empowered to negotiate and grant access to genetic resources;
- the large number of officials from different departments and different levels of government with authority to determine access and thus involved in each access negotiation;
- the lack of clear guidance on whose consent is needed to ensure that 'mutually agreed' activities have satisfied all legal agreements exhaustively;
- difficulty in reaching a level of confidence that, once an agreement has been successfully negotiated with the appropriate institutions and authorities, the need to obtain consent from others will not arise in the future; and
- the time needed to negotiate and reach agreement with all the officials concerned, as well as other stakeholders such as local and indigenous communities.

Setting in place legal and institutional mechanisms that both regulate and enable access and benefit-sharing partnerships may require considerable internal changes within, for example:

- government and regional administrations, as well as the decision-making structures of communities, protected areas and other 'providers' responsible for granting PIC, in terms of capacity to negotiate benefit-sharing agreements effectively and expeditiously; and,
- scientific institutions and local enterprises seeking to develop and take part in access and benefit-sharing partnerships, in terms of financial and technical capacity to collaborate in value-added research and development.

When producing elements of a strategy to address laws related to access, the strategy team should focus on clarity on which bodies are authorised to determine access and the distinction between different users and uses of genetic resources.

Clear access authorities and the possibility of decentralisation: The first step in ensuring a workable access system is to nominate a focal point to provide information on legal regimes related to access in the country, and, if appropriate (typically when government does play a role in regulating access to genetic resources), one or more competent national authorities responsible for regulating access. The burden of administering applications for every single transaction involving access to genetic resources of whatever kind for whatever purpose is a heavy one for any government department or interdepartmental committee. The strategy team could consider some alternatives, such as decentralisation, self-regulation (with possible inspection) by institutions and even a system of registered or certified institutions.

- **Decentralisation:** In some countries, regional government may have a role in administering ABS. This may help with consultation of local stakeholders and in sharing the load of administering applications for access. However, national consistency and streamlining of regional ABS processes are desirable. This may be a challenge, particularly in countries with federal systems, where state governments have jurisdiction over ABS issues. In Australia, for example, there are currently 40 separate permit systems and national legislation is limited to Commonwealth areas. In Malaysia, both Sabah and Sarawak have taken steps to regulating ABS at the state level. The strategy team should consider how any decentralisation of ABS controls can be harmonised and well coordinated to avoid the emergence of a complex patchwork of multiple standards.
- **Self-regulation (with options for government oversight):** Domestic universities and *ex situ* collections could be invited to adopt Codes of Conduct or institutional policies setting standards agreed with government access authorities on prior informed consent, maintenance of records of the acquisition, use and supply of specimens, and fair and

equitable benefit-sharing arising from academic use of genetic resources. Once the government access authorities were confident that the institutions concerned understood and had the capacity to abide by these standards and to be responsible for compliance by their employees and students, the institutions could administer their own access and benefit-sharing activities. Compliance could be inspected periodically by the government authorities. In the Philippines, the access authorities have developed a model Code of Conduct for academic research to which institutions can subscribe. Some botanical gardens have also developed guidelines for the development of institutional policies along similar lines (see http://www.rbgkew.org.uk/conservation/agrbs-policy.html). Appendix 4.6 provides an overview of the range guidelines and codes of conduct currently in use for ABS.

- **Registration/Certification:** One stage further from the adoption by institutions of Codes of Conduct would be a national or international system for registration of institutions that commit to abiding by common standards on ABS. For institutions involved in a large number of exchanges of genetic resources, such an approach could reduce transaction costs considerably, as well as harmonising ABS standards, thus facilitating the exchange of materials. This approach merits further consideration and is discussed in a forthcoming publication (Glowka, 2001 – in press).

Distinction between commercial and non-commercial use: Users of genetic resources can be as varied as a local student seeking access to a couple of herbarium specimens to a multinational company seeking access to many thousands of specimens for high-throughput screening for the development of a pharmaceutical. The division between 'commercial' and 'non-commercial' use of genetic resources is difficult to draw and can become blurred. However, benefits of a different nature and magnitude are involved in academic research and commercial development and some 'scientific' users such as students and botanic gardens cannot afford the transaction costs involved in complex ABS negotiations better suited to commercialisation agreements. Also, the risk of strategic and commercially significant loss to a country is less in the case of access by a herbarium to prepare specimens than by a company to prepare extracts for screening. While some activities are close to the boundary, the majority can be clearly categorised as commercial or non-commercial, so it is probably more pragmatic to draw this distinction and thus keep transaction costs and administration to a minimum. Any 'fast-track' system of ABS for scientific use could rest on ensuring that 'scientific' recipients are legally bound only to use the genetic resources for non-commercial purposes and not to pass them on to third parties for any other (commercial) purposes.

4.4.4 Conducive policy framework

Sections 2.4 and 2.5 showed the range of economic, sustainable development and sectoral policies and programmes that involve cross-cutting issues related to ABS. In the assessment phase of an ABS strategy, the strategy team should research existing sectoral and cross-sectoral strategy documents and coordinate with other, ongoing strategy processes. That way, during the strategy phase, the ABS strategy team and stakeholders can build on strategies formulated in related fields and create 'synergies' between strategy processes. This can help streamline implementation. They can also work with teams developing policy in other areas to encourage them to 'mainstream' ABS issues by reflecting key elements of the ABS strategy within their own policies and strategies. A strategy team could therefore build the priorities identified in an ABS strategy into policies on education, science and technology, using the results of the assessment of strategies and policies in related areas. Interviews with members of strategy teams from the related policy areas could help clarify their recommendations and establish how the ABS strategy can contribute to achieving their goals. Experts in these other areas could be involved in the strategy formulation exercise by participating in workshops or helping to develop scenarios. Similarly, members of the ABS team can meet other strategy teams to make presentations of the ABS strategy process and to seek collaboration, so that the results are mutually supportive and strategies in other sectors promote the key recommendations of the ABS strategy.

The team could explore with policy-makers throughout government the priorities for the ABS strategy. They could address ways to build political commitment within different government departments for implementation of the ABS strategy, mechanisms for improving coordination on related issues within government and identify policy options in areas including:

- **Bioenterprise:** creating and providing access to markets for products derived from genetic resources. Issues to consider may include: venture capital, soft loans, micro-credit and tax breaks; stabilisation schemes to overcome risk; publicity and export promotion; capacity building for product approval and certification; and infrastructure (e.g. energy, transport and telecommunications). Appendix 4.4 provides further information on incentive measures to boost domestic capacity in bioenterprise.
- **R&D:** supporting science and technology in areas such as:
  - **Health:** building capacity for discovery, development and production of safe botanical medicines and pharmaceuticals from genetic resources, and for research into standardisation of traditional medicines, to meet local health needs in terms of primary healthcare and priority diseases;
  - **Biotechnology:** building capacity for discovery, development and production of biotechnology with applications in agriculture, health, clean industrial processes, waste treatment, biomaterials and energy and for risk assessment and management of GMOs;
  - **Agriculture, Forests and Fisheries:** agricultural, fisheries and forestry research programmes for discovery, development and production of food, forage and timber crops, ornamental horticultural varieties, pulp and paper, and non-timber forest products; development of community and national gene banks, nurseries. Appendix 4.5 provides further information on measures to support R&D.
- **Conservation:** strengthening conservation, by developing access regulations and ABS partnerships that minimise environmental impact and dedicate some benefits to conservation. Also, by strengthening the capacities of the stakeholders in protected areas and of *ex situ* collections.
- **Trade, Foreign Affairs and Development Cooperation:** work with other governments to ensure trade and IPR law and policy support fair trade in value-added products derived from genetic resources and related knowledge; and to encourage law and policy in other countries related to ABS concerning both the provision and use and import of genetic resources to be workable and complementary;
- **Law:** clear, simple, unbureaucratic access laws; laws and economic incentives on taxation, property rights, foreign direct investment and trade in products derived from genetic resources; and assistance negotiating fair ABS agreements and strengthening bargaining position;
- **Indigenous and cultural affairs:** clarity on rights (including collective rights) of communities over genetic resources and associated information, knowledge, innovations and practices; clarity on procedures for PIC (who may consent on behalf of a community, how); registers, 'digital libraries' and forms of *sui generis* property right to protect collective traditional knowledge in the public domain against patents and other IPR claims; capacity-building for ABS negotiations; and appropriate benefit-sharing mechanisms.

4.4.5 Matching domestic needs and priorities with the benefits available

Perhaps the most important reason for developing an ABS strategy is to understand what a country could most usefully – and realistically – achieve by regulating access. Consequently, identifying the priority domestic needs that could be met through ABS partnerships is arguably the most important stage in preparing an ABS strategy. This section will deal first with the kind of benefits typically available from partnerships, and then with prioritisation of needs within a country that can be met by benefit-sharing.

Box 8: 'Benefit-sharing' in the CBD	CBD
Benefit	**Article**
• desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components	Preamble
• the objectives of this Convention are ... the fair and equitable sharing of the benefits arising out of the utilization of genetic resources	Art.1
• respect, preserve and maintain the knowledge, innovations and practices of indigenous and local communities ... promote their wider application with their holders' approval and involvement ... and encourage the equitable sharing of the benefits arising from their utilization	Art. 8.j
• full participation of provider in scientific research based on genetic resources provided	Art.15.6
• measures with the aim of sharing fairly and equitably the results of research and development	Art.15.7
• ... and benefits arising from the commercial or other utilization of genetic resources	Art.15.7
• access to and transfer of technology using genetic resources to countries providing them	Art.16.3
• effective participation by providers in biotechnological research on the genetic resources	Art.19.1
• priority access to the results & benefits from biotechnologies based on genetic resources provided	Art 19.2

(i) Demand side: establishing priority benefits to negotiate into ABS partnerships.

Priorities for benefit-sharing can be established in two main ways:

- by working with domestic stakeholders, building on the assessment of institutional infrastructure referred to in section 3.3.1; and
- by drawing on priorities established in related areas of policy-making and mainstreaming ABS priorities into other, ongoing strategy initiatives (synergies and mainstreaming: see sections 2.4 and 2.5).

The tools used to establish these priorities can range from simple interviews and questionnaires, to the use of SWOT and STEEP analyses, and several other techniques described in Part 2.

The priorities that emerge from such an exercise may lie in a number of areas in conservation and sustainable development. For example, conservation priorities may include investment in protected areas and strengthening *ex situ* collections. Sustainable development priorities may include creating sustainable livelihoods linked to the use of genetic resources or building capacity in academic and research organisations in disciplines identified as key for competitiveness (e.g. information technology and biotechnology) for scientific research and product development. This assessment can be linked to technology foresight programmes to create a vision of the value-added economy of the future and decide in which disciplines to train people so they can add value by working on genetic resources. (Scenario planning may be particularly helpful here.)

Priorities can be identified not only at a national level, but at a provincial or even local level. If access permits are granted by provincial or municipal branches of government, benefits can be prioritised to meet the needs of that locality. Communities' needs can be established through locally based assessments and trust funds, so that monetary benefits can be directed to locally-determined priority needs.

(ii) Supply side: identifying benefits available from ABS partnerships

Benefits can be as varied as the imaginations of the parties to an agreement allow. Experience is growing with ABS partnerships between different users and providers of genetic resources, and benefit-sharing practices are now increasingly well-documented (see, for example, UNEP/CBD/COP/3/20; UNEP/CBD/COP/4/22, and the benefit-sharing case studies listed in Appendix 4.7). Awareness of precedents, and the opportunity to discuss what works and what is impossible for each stakeholder group, will help to ground benefit-sharing expectations in fact. However, as the CBD Expert Panel on ABS has noted, there are still significant gaps in the information available.

Partnerships involving access to genetic resources can offer benefits of three main kinds: improved conservation; training and capacity building; and sustainable economic development. Box 9 provides examples of both monetary and non-monetary benefit-sharing.

Box 9: Common benefits shared in ABS partnerships

Monetary benefits:

- up-front fees, either for access to genetic resources, or to cover the costs of any preparation of samples, research conducted on them, and handling and shipping costs;
- milestone payments when various stages in discovery and development are reached (either independent payments, or set-off against any royalties that may be incurred in the future); and,
- royalties - it is important to clarify the basis of royalty payments, for example whether they are calculated on gross or net sales.

Non-monetary benefits:

- participation of source-country scientists (who may be third parties) in research;
- transfer of equipment, software and know-how;
- exchange of staff and training;
- in-kind support for conservation (*in situ* and *ex situ*);
- acknowledgement of providers in research publications, patents and other forms of IPR;
- joint patent rights or other IPRs;
- sharing of research results, including notification of discoveries and ensuring that copies of publications concerning research on the genetic resources are sent to the source country;
- voucher specimens to be left in national institutions; and
- rights to license technologies developed from research on the genetic resources (at discounted rates).

Non-monetary benefits are an increasingly important component of ABS agreements. First, many uses of genetic resources are non-commercial and only give rise to non-monetary benefits. Second, many forms of commercial discovery and development only lead to a successful product (and thus monetary benefits) in a small proportion of cases, and often after many years. Finally, non-monetary benefits often boost competitiveness by building long-term capacity in source countries, e.g. increased scientific capacity through joint research.

The type and magnitude of the benefits that arise from access to genetic resources will vary from case to case, not only in terms of whether use is for academic or commercial purposes, but also in terms of the particular use that is being made of the genetic resources (see Appendix 4.7 for a comparative list of case studies.) In addition, ten Kate and Laird (1999) provide an overview of benefit-sharing practices in different industry sectors and identify factors (such as market size and the contribution of the original genetic resource to the final product) which influence benefit-sharing opportunities. Laird (2000) compares benefit-sharing in the pharmaceutical and botanical medicines sectors.

Benefits negotiated as part of access agreements are usually associated with the use of the genetic resources for which access is permitted, e.g. participation in biochemical research, or access to the technology used to conduct research on the genetic resources being accessed. Sometimes, however, benefits can be negotiated which are related more to the provider country's own priorities than to a user's activities. For example, a provider-country institution working with an access applicant can seek screens and training in therapeutic areas of priority to the country, e.g. malaria or river blindness, in exchange for samples that the applicant company will screen against its own therapeutic priorities, such as cancer and HIV. Some benefits, particularly for use at the community level, can be quite unrelated to the intended use of the genetic resources, and are really an 'in kind' equivalents of monetary benefits. Examples from earlier benefit-sharing partnerships include funds for communities to revitalise local health traditions, buy cows or create an airstrip.

However, while accounts of ABS partnerships provide information on non-monetary benefits such as joint research, and on monetary benefits such as royalties, there are fewer examples of how

ABS partnerships support conservation. Nevertheless, ABS strategies and the partnerships that follow them offer several opportunities to enhance conservation capacity. Access regulations often contain provisions requiring applicants to minimise the environmental impact of their activities, and, in cases where there is a clear risk of environmental damage, to conduct environmental impact assessments of the proposed activities. They also typically facilitate access only for sustainable uses of genetic resources. Indeed, ABS legislation is often framed within broader laws on the conservation and sustainable use of biodiversity. An ABS strategy could strengthen laws governing biodiversity, e.g. by streamlining administration of access to genetic resources with that of CITES and 'red lists', to ensure access applications are properly vetted for their conservation implications. In addition, an ABS strategy could enhance the delivery of benefits arising from access to specific conservation activities. The following examples illustrate how ABS agreements can support conservation priorities.

In December 1993, the Western Australian Department of Conservation and Land Management (CALM) entered into an agreement with an Australian pharmaceutical company, AMRAD, to access and commercialise a species of smokebush (genus *Conospermum*) which had shown promising activity against cancer. In return, AMRAD agreed to provide CALM Aus$1.15m, a share in royalties, rights to conduct research on the active compound, and Aus$ 500 000 for further research on some 8 smokebush patents lodged by CALM. CALM used funds generated by the agreement to support Western Australia's conservation infrastructure. Aus$ 300 000 was allocated for the conservation of rare and endangered flora and fauna, and a further Aus$ 300 000 for other conservation activities, including geographical information systems and other information technology.

The work of Costa Rica's National Biodiversity Institute (INBio) is based on a cooperative research agreement with the Ministry of Environment and Energy (MINAE). This sets the terms and conditions for INBio's biodiversity inventory and bioprospecting activities. According to this agreement, INBio will donate 10% of all bioprospecting budgets, and 50% of all income from royalties, to conservation efforts by MINAE.

An ABS strategy could target a range of conservation priorities, such as: know-how and technology in micropropagation; strengthening *ex situ* collections; establishing trust funds with conservation purposes into which monetary benefits and grant monies can be paid; and studentships in related disciplines such as ecology and taxonomy. Such benefits can later be negotiated on a case-by-case basis in exchange for access.

4.4.6 Drawing up the core strategy

Following discussion, analysis and strategising, the strategy team and the stakeholders it has worked with should have identified key goals they believe important to the ABS strategy on issues such as competition and cooperation, identification of distinct competencies, necessary elements of a conducive legal and policy framework, articulation of priority domestic needs, and identification of benefits that are likely to be available through partnerships to meet them. These goals constitute the key elements of the ABS strategy.

However, a strategy cannot be exhaustive. A major part of strategic thinking is to identify the highest priorities for action that are realistic and capable of leveraging the greatest benefits over the planning period. It would defeat the purpose to list every possible goal for ABS and a large number of potential means of achieving each one. No strategy is forever: once the initial goals are accomplished, a new strategy can be prepared. Rather than clouding the issue with large numbers of unattainable goals, it is better to identify relatively few elements of the strategy and achieve them.

For example, the Colombian NBSAP component on fair and equitable benefit-sharing identifies five priority areas: (i) decision-making mechanisms; (ii) stakeholder capacity to negotiate benefit-sharing arrangements; (iii) national capacity to negotiate at the international level and with foreign

investors; (iv) elimination of market distortions and obstacles to fair and equitable benefit-sharing; and (v) capacity-building for value addition. The biodiversity sector report for South Africa's Biodiversity Foresight project sets out 11 recommendations for a focused R&D programme on biodiversity. It states that these are neither detailed nor comprehensive, but encapsulate 'the most important areas where R&D can contribute to wealth creation and quality of life by promoting development and use of biodiversity-based activities and products'. They range from improving the biodiversity knowledge-base, to value-addition and economic development of specific business sectors (e.g. tourism and biotechnology) (Appendix 2.4.2).

Once the key elements of the strategy have been identified, they can be put together in a short document setting out the essential requirements for achieving the shared vision. This constitutes the core strategy. However, this does not go into the detail of how each of its elements will be achieved. That stage comes next.

4.5 Developing elements of the core strategy

4.5.1 Exploring and selecting options

Once the elements of the core strategy have been identified, the strategy team can work with stakeholders to identify options for achieving them, then select and refine the most promising ones. Techniques such as SWOT analysis and scenario planning (Tool Kit 3.4 & 3.7) may help to test – at least in exercises of the imagination – different strategic options for their robustness. Since ABS is an experimental and fast-moving field, it may be useful to draw on practical experience (e.g. by establishing close-monitored ABS partnerships prior to formulation of the strategy), when exploring and selecting these options. It may also help to consider the individual steps that would need to be taken to implement these options, though this is strictly part of the action plan process. However, both these points illustrates the fact that the different stages of strategy, action plan and implementation are, in reality, part of a continuum and serve to inform each other (see also Part 1.3).

4.5.2 'Strategic fit'

When examining options to achieve elements of the core strategy, it is important that each of the these elements complement:

- each other (to be mutually reinforcing, and to retain coherence within the core strategy);
- the common vision;
- the subsequent action plan (which may hence be developed in parallel); and,
- policies and laws in sectors affected by ABS (see Parts 2.4, 2.5 and 4.4.4).

This will prevent components of the strategy undermining each other, help to reduce redundancy and wasted effort in relation to parallel laws and policies, and so increase the chances and efficiency of implementation. Corporate strategists refer to this 'strategic fit', and regard it as important, since competitive advantage grows out of the entire system of activities a strategy sets in place (Porter 1996). Among the tools for strategic thinking set out in Section 4.2, the balance scorecard approach is particularly useful to improving 'strategic fit' (Tool Kit 3.1). It helps to ensure that measures to improve performance from one perspective do not compromise performance from another.

PART 5: IMPLEMENTATION

Once the strategy has been spelled out, the next step is to prepare an action plan that sets out the steps needed to achieve each element of the strategy. This manual is primarily concerned with preparing an ABS strategy. However, as stated in section 4.5.1, it may only be possible to select preferred options for the strategy when these individual steps are identified. The strategy and action plan stages could therefore be done iteratively, and in parallel. Given the close links between strategy, action plan, implementation and feedback, this part of the document shifts to a brief consideration of how to prepare an action plan.

5.1 Formulating and implementing an action plan

Action plans operationalise strategies. While strategies set policy direction, action plans break them down into individual steps that can be implemented automatically. The emphasis is therefore on specifying the steps that need to be taken, and, for each of these, designating time frames, parties responsible and budgets. Action plans can be prepared at both national and sub-national levels. For example, India is developing national, eco-regional, state and local biodiversity action plans.

The success of an action plan rests on participation in its design by institutions with the capacity and/or motivation to take responsibility for implementing it, e.g. government agencies, provincial and local governments, universities and scientific institutions, conservation NGOs, communities and businesses. But when designating responsibilities for implementation, an action plan must realistically reflect the financial, technical and human resources that individual institutions are able to commit. It may be necessary both to highlight those activities for which financial and donor assistance is required, and to incorporate capacity-building measures (e.g. training of personnel) to support designated institutions.

Furthermore, there is little point in delegating responsibility for implementation without a mechanism to ensure that the institutions in question respect their action plan commitments. For example, shifts of key personnel (e.g. due to changes in government) may impair an institution's ability to act. It is therefore essential to monitoring their implementation efforts (see section 5.2). In may also be possible for the instrument used by government to formally adopt an ABS strategy to specify the government agencies responsible (García Fernández, 1998).

To avoid duplication of efforts, an action plan must also account for existing activities, both at the grassroots (e.g.. within scientific institutions or businesses), and under parallel government strategies, plans and programmes. There may be scope for joint implementation and co-funding of projects where an ABS action plan complements existing activities.

If, however, an action plan is not clearly linked to elements of the core strategy, and is not adequately prioritised (e.g.. as short-, medium- and long-term, actions), it risks becoming an extensive 'wish-list' which donors and finance officials will be reluctant to invest in. It may also be easier to allocate financial and institutional resources if actions plans are designed as a series of budgeted projects. This approach has been taken by a number of NBSAPs, e.g. Guyana's, as well by as other sustainable development initiatives, e.g. South Africa's Cape Action Plan for the Environment (CAPE).[18]

Depending on the core elements of an ABS strategy, action plan projects could, for example, train up a team of skilled negotiators for ABS partnerships, build a 'research platform' (databases and extraction facilities) for bioprospecting in protected areas, establish community-based micro-

[18] Pers. comm. Dr Maureen Wolfson, NBI, South Africa, 9 February 2001.

enterprises to derive greater local benefits from genetic resources and associated knowledge, or explore incentives for R&D partnerships between national universities and the private sector.

If designing an action plan as a series of projects, it may be useful to define:[19]

- Title of each project;
- Objective;
- Context – linkage between the project and the strategy, as well as other plans and policies.
- Description of the project;
- Description of the geographic area covered (if appropriate);
- Implementing institutions: the roles and responsibilities of each, and the types of the partnerships that need to be developed;
- Target starting date and length of the project; and,
- Budget.

Logical frameworks (logframes) are a particularly useful tool for thinking through these various aspects of an individual project. Furthermore, logframes place great emphasis on monitoring and evaluation of implementation. Tool Kit 4.1 provides an introduction to logical framework analysis.

5.2 Monitoring and evaluation

Maintaining the momentum of a policy process is essential for achieving implementation.[20] An ABS strategy is not therefore an end in itself. It is a continuous process of setting policy direction, taking action to implement this and, based on successes and failures, readjustment of policy direction. Cyclical strategy processes are essential in a demand-driven sector such as access to genetic resources, where the opportunities to generate benefits are unpredictable and difficult to capture.

Monitoring and evaluating implementation of an action plan provides the basis on which to modify actions if they prove ineffective, and to revisit and adjust the core strategy. A permanent interagency committee to oversee the strategy process (as recommended in Section 2.1) may help co-ordinate monitoring and evaluation, and ensure that key institutions with responsibilities for implementation remain engaged.

However, successful monitoring and evaluation also requires the participation of those directly affected by an a strategy, not just in providing information but in actually designing and taking joint responsibility for the monitoring and evaluation process. Participatory monitoring and evaluation is now commonly used to assess the success of development projects or initiatives such as local Agenda 21s. By involving stakeholders in the design of indicators against which to assess implementation, it can provide a clearer picture of developments on the ground than external assessments using pre-set indicators (IDS, 1998).

Who should be the primary focus of a participatory monitoring and evaluation system? For an ABS action plan this is likely to be a range of stakeholder 'constituencies', e.g. local communities, NGOs, scientific researchers, the private sector, local and provincial governments, lower-level staff in central government agencies, and even foreign access applicants. Within each of these stakeholder 'constituencies', it will be necessary to identify who should be and who wishes to be involved.

It will also be necessary to identify a mechanism for stakeholder involvement in monitoring and evaluation. One solution might be the formation of permanent stakeholder task forces. Each one will need to agree:

[19] Adapted from Hagan (BPSP).
[20] Wolfson (2001).

- the priorities for monitoring and evaluation;
- the indicators that provide the information needed;
- the methods, responsibilities and timing for information gathering;
- how information will be used and by whom; and,
- how the process will be sustained (IDS, 1998).

But task forces require the resources to act effectively, and will need to be built into an action plan, including budgets and training.

The key to effective monitoring and evaluation is the correct choice of indicators. Tool Kit 4.1 on logical framework analysis outlines criteria for selecting objectively verifiable indicators. Given the potential scope of an ABS strategy, it is hard to anticipate what suitable indicators might be. They might range from measures of improved demand for access (such as the number of applications received), to measures of the level to which ABS partnerships are supporting primary health care (e.g. number of prescriptions made out for specific natural product-based medicines). The success of an ABS strategy might also be reflected in whether subsequent ABS partnerships are fair and equitable. Tool Kit 4.2 contains a list of possible qualitative indicators for assessing this. These indicators examine both the negotiation process that establishes a partnership and the content of the ABS agreement.

TOOL KIT

1 TOOLS FOR PARTICIPATION

There are numerous methodologies for participatory assessment and planning. Among the most popular is Participatory Rural Appraisal. Others include Rapid Assessment Techniques, Participatory Action Research and Agroecosystems Analysis to name but a few. Most of these approaches share the same common principles: (i) cumulative learning by all participants; (ii) accommodation of multiple stakeholder perspectives; (iii) group analysis and interaction; (iv) adaptation to specific conditions and actors; (v) stakeholder capacity-building to carry out their own studies; and (vi) defining and bringing about change, e.g. local institution-building (Pretty, et. al., 1995).

A wide range of tools also exists to facilitate participatory processes. An indicative list is provided below, roughly grouped into: (i) tools to facilitate stakeholder consultation and analysis, and (ii) tools to facilitate stakeholder negotiation and decision-making. Some, however, are applicable to both.

1.1 Tools to facilitate stakeholder consultation and analyses

The following tools may be useful when working with stakeholders to assess their interests and patterns of resource use, especially if used in conjunction with a participatory assessment methodology such as the '4Rs' framework - an analysis of stakeholders' Rights, Responsibilities, Revenues, and Relationships (see Dubois, 1998).

Distributed questionnaires - semi-structured or fully-structured (e.g. multiple choice)	For large-scale gathering of qualitative and quantitative information.
Interviews, e.g. with key informants	Capturing stakeholder-specific views that may not otherwise be expressed in open fora. Questions can be defined up-front (structured) or modified as the exercise proceeds, and as facts and opinions come to light (semi-structured).
Public hearings	To raise awareness, identify stakeholders and record their concerns.
Commissioned studies	Expert information on a theme or sector, e.g. markets, as a basis for stakeholder review and discussion.
Seasonal calendars, diaries	To describe changes in the environment, resources and land use.
Photographs	To depict changes through a sequence of images.
Maps, including GIS technology	To map land and resources used by a community
Historical mapping	To portray changes to particular resources over time – separate maps are developed for different points in time.
Trend Analysis	To describe change over time - depicted graphically with time on one axis and abundance or another indicator on the other.
Matrix scoring/ ranking exercises	To elicit stakeholder preferences.
Network diagrams	To show the type and degree of contact between people and services.
Venn diagrams	To show relationships between groups, institutions and individuals

1.2 Tools to facilitate stakeholder negotiation and decision-making

The following tools may be useful when working with stakeholders to set an agenda, build consensus and reach decisions:

Workshops, public meetings, stakeholder committees	Consensus-building, identifying priorities and assessing progress with implementation.
Group brainstorming e.g.. within focus groups (citizen groups) and task forces (groups of experts or peers)	Brainstorming amongst selected stakeholders to explore solutions to a specific problem, or to examine a specific theme or sector.
Nominal group technique	To collect individual ideas and reach a consensus on key courses of action (ideas are written on cards which are then clustered).
Guided imagery	To depict a 'trip into the future'.
Problem/ solution mapping or problem 'trees'	To map an area of interest, indicate where areas exist and propose solutions.
Matrix scoring/ ranking exercises	To compare people's preferences for a set of options or outcomes
Flow diagrams	To show direct and indirect impacts of change.
Network diagrams	To show the type and degree of contact between people and services.
Venn diagrams	To show relationships between groups, institutions and individuals

Presenting the results of a participatory process in formats that different stakeholder groups can understand presents a major challenge.[21] For example, visual formats such as network diagrams and venn diagrams may be suitable for community-based stakeholders, whereas information newsletters and websites to present the results of taskforce conclusions or commissioned studies may be more suitable for national decision makers.

1.5 Key references on participatory techniques

- Abbot J. and I. Guijt (1998) Changing views on change: participatory approaches to monitoring the environment, IIED, London.
- Borrini-Feyerabend, G., (1997), Beyond Fences – Seeking Social Sustainability in Conservation, IUCN.
- Chambers, R. (1992) Rural Appraisal: Rapid, Relaxed and Participatory. IDS Discussion Paper 311, IDS, Brighton, UK.
- Dubois O. (1998) Capacity to Manage Role Changes in Forestry: Introducing the '4Rs' Framework, IIED, London.
- Estrella M. (2000) (ed) Learning from Change: issues and experiences in participatory monitoring and evaluation, IT Publications.
- Hagan, R. A Guide for Countries Preparing National Biodiversity Strategies and Action Plans, BPSP-UNDP www.undp.org/bpsp/
- Lawrence, A. & B. Ambrose-Oji, Participatory Evaluation of Biodiversity – a literature review, In preparation, DfID Project R7112.
- Pretty, J. N., I. Guijt, J. Thompson, I. Scoones (1995), Participatory Learning and Action, A Trainers' Guide, IIED, London.
- The World Bank Group, The World Bank Participation Source Book, http://www.worldbank.org/wbi/sourcebook/sbhome.htm

[21] Pers. Comm. Kate Schrekenburg, ODI, 18 April 2001.

TOOL KIT

2 TOOLS FOR CONDUCTING AN ASSESSMENT

2.1 Sources of literature on ABS

A literature search in the assessment phase could include:

- **Case studies of ABS partnerships**: see Appendix 4.7; and the bibliographies in this Manual – in particular Laird (2001), and ten Kate and Laird (1999);
- **Demand for access to genetic resources:** trade and industry journals, financial and investment analysts, financial newspapers and magazines (e.g. Financial Times, Economist), and the often excellent information available on the websites of industry associations (e.g. the Pharmaceutical Research and Manufacturers of America, at http://www.phrma.org/) – see bibliography in ten Kate and Laird (1999) for more detail.
- **Legislation and policy:** laws and policies related to access to genetic resources and benefit-sharing within the country and in other countries (CBD National Reports, CBD Clearing-House Mechanisms – global http://www.biodiv.org/chm/ and national).
- **Scientific publications and databases**; e.g. species checklists and databases of associated traditional knowledge maintained by *ex situ* collections and universities.

2.2 Questions to assist in assessment of legal regimes related to access and benefit-sharing

- Which department(s) of government have authority to grant prior informed consent?
- What levels of government (federal/national, state, regional/departmental, local/municipal) have authority to determine access?
- Does the state regulate access on private as well as public land?
- Are all important categories of genetic resources (e.g. microorganisms) and of geographical areas (e.g. marine territory) covered?
- What laws currently in force in the country regulate or influence access to genetic resources and benefit-sharing? These might include: access legislation; CITES and its national implementation, endangered species laws; biodiversity and protected area laws; phytosanitary laws; biosafety laws; private property law, including land tenure; public law related to property, technology transfer; law related to indigenous communities; and intellectual property law (including *sui generis* regimes).
- What laws and/or guidelines and codes of conduct on access and benefit- sharing in use within the country would help enforce access measures taken by other countries and access and benefit-sharing agreements?
- Are there any legal or policy requirements or reasons to cooperate with neighbouring states sharing genetic resources, local and indigenous communities and even trans-boundary protected areas?
- What forms of intellectual property right exist in the country? What forms of genetic resources and their derivatives (e.g. plant varieties or biotechnological processes) can be protected by IPRs in the country? To what extent can these protect innovation by scientists within the country as well as traditional knowledge held by local and indigenous communities?
- What role does/should government play in the regulation of access: oversight, negotiation, approval and monitoring of access agreements? (At one extreme, a government might be party to each access agreement. At the other extreme, a government might establish laws that guide the development of access and benefit-sharing arrangements but then remain distant from all negotiations and transactions, leaving private institutions to enter into their own agreements, consistent with the law.)
- If the authority to determine access is shared between different departments and levels of government, how can this be coordinated and how can applicants for access identify the appropriate authority from whom to request permission for access?
- Has/should an inter-ministerial or inter-agency committee (possibly with a technical advisory committee) be established to coordinate the evaluation and granting of access applications?

- Which agencies and groups should be represented on this body/these bodies? (For example, relevant government departments, such as environment, agriculture, forests, health, trade and industry, science and education, foreign affairs, and representation and participation of indigenous and local communities, the private sector, the research community, non-governmental organisations, and other stakeholders.)
- How can an applicant for access be sure that all those whose consent is needed in a given case have been identified?
- Is there a system of land registry or some other database that applicants for access could search to identify and contact landowners on whose land they would like to work?
- Do local and indigenous people and communities have legal standing to enter into agreements? What is their land and resources tenure status? Is the contribution of local communities to the maintenance and development of potentially useful genetic resources given adequate recognition in existing law?
- How can different communities be distinguished?
- Who can grant prior informed consent and negotiate benefit-sharing on behalf of local and indigenous communities?
- Are community members' rights individual or collective?
- If a member of a particular community provides access to genetic resources or valuable information, should benefits be shared with the individual, his family, his community, the pool of individuals or communities who share the same resources/knowledge (and if so, how can this be determined), all those of the same ethnic origin, the nation?
- What happens if a certain proportion of members of a community agree to negotiated terms, but the rest do not?
- What happens if certain communities break away from umbrella groups that represented them and with whom access agreements were negotiated?

2.3 Questions to assist in assessment of domestic stakeholders – their needs and capacities

The assessment should explore the key abilities and challenges that domestic stakeholders face entering into partnerships with other organisations and companies, developing products and reaching markets.

Capacities of domestic stakeholders

- In communities, have issues of who is entitled to give prior informed consent (PIC) for access to genetic resources and associated knowledge been clarified? If more than one community shares control of particular genetic resources or knowledge concerning them, whose PIC is needed for access? Are communities' uses of genetic resources documented and under what terms and conditions can this information be accessed?
- In the public sector, what are the numbers and qualifications of professors, researchers and students (i.e. undergraduate, post-graduate and post-doctoral) in universities, public agencies and research institutes in disciplines related to access and benefit-sharing such as biochemistry, biotechnology, business, economics, genetics, plant breeding, law, anthropology, pharmacology and taxonomy. What is their capacity for product discovery, development and marketing? What is their capacity for assisting in the establishment of fair and equitable ABS partnership?
- In the private sector, what is the number, scale and activities of small and medium sized enterprises and multinational companies conducting research on genetic resources in the country. Such a review may be conducted either by contacting a number of enterprises directly or through contact with industry associations, or a mixture of the two.
- What technology and financial resources are available to invest in innovation, product approval and marketing?
- Do you produce 'value added' products from the use of genetic resources and associated information? (These could include: final products such as pharmaceuticals, botanical medicines, new crop, fodder and horticultural varieties, crop protection products, biotechnologies and cosmetics and personal care products and value-added 'intermediate' products from which these are discovered and developed, such as information on uses and properties of genetic resources, bioactive molecules, isolated genes,

enzymes, etc.)

- Are you able to obtain the raw (genetic) materials, other materials, technology and equipment needed to develop products from genetic resources and associated knowledge?
- Are there markets for the products for the products you make? Are these local, national or export markets?
- Do you have the capacity to serve these markets (e.g. formal or informal organisations to market your products, transport and infrastructure to market products, capacity to meet any regulatory or product approval standards in force)?
- Are there any extension services, support services, bureaux for advice on technology transfer, IPRs, licensing, product approval and international markets, sources of financial loans, venture capital, grants etc. to whom you can turn for help?
- Do you understand the current law and policy on ABS in the country? What advice and support is available to help you follow ABS regulations? What advice and support is available to help you if you are approached for access to genetic resources and knowledge so you can negotiate favourable access and benefit-sharing agreements?
- Are skilled people from your community/organisation available to work in partnership with other organisations in the country and with foreign individuals or organisations seeking access to genetic resources?

Needs of domestic stakeholders:

- What kind of help do you need to make greater use of genetic resources and how do you think this could best be provided? Possibilities that could be discussed with stakeholders, in addition to any others they raise themselves, include:
  - *Technical advice*: extension & support services, bureaux for advice on technology transfer, IPRs, licensing, product approval and international markets.
  - *Finance*: sources of financial loans, venture capital, research grants.
  - *Legal advice*: legal assistance to form organisations with legal personality able able to enter into agreements with partners (e.g. companies, partnerships, associations, cooperatives, collectives, etc); advice and support during the negotiation of prior informed consent and ABS partnerships; conflict resolution within communities or between communities/organisations, both within the country and in international partnerships.
- Priority benefits: Which of the following (or any others benefits that you can think of that could arise from access to genetic resources) are priorities for your community/organisation/company: opportunities to participate in research on the genetic resources together with those seeking access to them; access to information; access to technology; capacity building (in which areas?); financial benefits (such as fees per sample, milestone payments, royalties, etc). A list of potential benefits is set out in section 4.4.5 (Box 9).

Current domestic demand for access and benefits obtained in return[22]

The assessment phase can be used to understand the extent to which genetic resources (of both domestic and exotic origin), and associated traditional and formal scientific knowledge, are accessed in the country for domestic and foreign use, as well as which stakeholders are involved in transactions involving ABS.

- Does your own community/institution/company use genetic resources, associated knowledge, derivatives of genetic resources? (N.B. Derivatives might include extracts, bioactive compounds, gene sequences and gene constructs, enzymes, etc.) How? (This can be broken into more detailed information on the categories of genetic resources (e.g. plant, animal, microbial), their sources (e.g. *in situ*/*ex situ*) and the nature of the use).
- Does your own community/institution/company provide access to genetic resources and associated knowledge to other communities, organisations and companies?
- What kinds of communities/institutions/companies seek genetic resources, derivatives and associated knowledge from you? With what frequency and in what quantity? What do they look for from you as a provider?
- Do you provide genetic resources/derivatives and information and if so on what terms?
- What kind of benefits have you obtained in return and have you been satisfied that these have been fair?

[22] NB – more detailed questions on demand for access and best practice in benefit-sharing can be found in pp384-386 of ten Kate & Laird, 1999.

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2.4 Questions to assist in assessment of foreign stakeholders - their demand for access and current practices[23]

- Do you have any experience of collecting in the field in our country or obtaining genetic resources, associated information or derivatives from individuals or organisations within our country?
- From what kind of individuals, communities or organisations do you obtain them?
- Do you have experience of obtaining access to *ex situ* collections in our country (whether material originating from your country or elsewhere)?
- Do you obtain genetic resources, associated information or derivatives from our country from sources outside our country?
- Which intermediaries does your institution work with, e.g. botanic gardens, musea?
- What kind of material are you seeking (e.g. categories of genetic resources (plant, animal microbial), source (e.g. *in situ* or *ex situ*), whether raw material, value-added intermediate products or final products)?
- Who is responsible for getting permits or agreements, you or your in-country partner?
- Do you find it easy or difficult to access genetic resources from our country?
- Are you confident that you obtain unambiguous and clear rights to use the material as you would like to?
- What would encourage you to obtain genetic resources from our country in the future? What criteria influence your selection of partners (see list of factors for competitivity in section 4.4.1)
- Do you think demand for access to genetic resources will go up or down?
- What can you offer as benefits (see lists of benefits in section 4.4.5 (Box 9))? Why? Over what time scale?
- Are there laws or other measure governing access in your country? What codes of conduct do you follow?
- Does you institution have a policy on access and benefit-sharing?
- Does your institution have case studies documenting benefit-sharing partnerships in which you are involved?

2.5 Useful publications providing guidance on biodiversity assessments

The following publications provide guidance on conducting biodiversity assessments:

- Groombridge, B. and M. D. Jenkins, Assessing Biodiversity Status and Sustainability, WCMC Biodiversity Series No. 5.
- UK Resources as a Contribution to the Global Biodiversity Assessment (1996), Biodiversity Assessment. A Guide to Good Practice. HMSO, London.
- Moran. D, and C. Bann (2000) (Draft), The Valuation of Biological Diversity for National Biodiversity Action Plans and Strategies: a guide for trainers. UNEP
- Lawrence, A. & B. Ambrose-Oji, Participatory Evaluation of Biodiversity – a literature review, In preparation, DfID Project R7112.

Resource material on managing information gathered during assessments includes:

- UNEP-WCMC (1996), Framework for Information Management (principles and techniques for developing national information systems to facilitate decision making);
- UNEP-WCMC (1995), The Resource Inventory (tools, data exchange standards, thematic information standards, sources, reference materials).

[23] NB – more detailed questions on demand for access and best practice in benefit-sharing can be found in pp384-386 of ten Kate & Laird, 1999.

TOOL KIT

3 TOOLS FOR FORMULATING AN ABS STRATEGY

3.1 Balanced scorecard

(Source: Kaplan, R.S. et al., *The Balanced Scorecard Approach*, in Dyson, R.G. et al. (1998), pages 55 – 65.)

A balance scorecard allows managers to maintain a comprehensive view of a business from four crucial perspectives (below), encapsulating the strategic vision of business. This encourages decision-makers to consider all key organisational measures at the same time, so that improvement in one perspective does not take place at the expense of another. As well as formulating a vision, the scorecard approach can help in monitoring implementation.

- **Customer perspective:** How do customers see us? I.e. needs of domestic and foreign users (commercial and non-commercial) of a country's genetic resources. What kind of access regime will be workable and promote compliance by those seeking access?
- **Internal perspective**: What must we excel at? E.g. legal and institutional framework for ABS that protects rights, promotes fair partnerships, meets priority needs and supports competitiveness. What are capacity-building priorities? What powers and resources are needed for bodies charged with processing, assessing and granting access applications?
- **Innovation and learning perspective**: Can we continue to improve and create value? I.e. the needs of academic institutions and innovators, including the private sector. Priorities for research and development, capacity building.
- **Financial perspective:** How do we look to shareholders? E.g. What kind of investment is needed by donors, the Treasury and foreign and domestic investors to support an access regime? What expectations are there of returns on this investment?

3.2 Visioning

Source: O. Brien, F.A. et al., *Future Visioning: a case study of a scenario-based approach*, in Dyson, R.G. et al. (1998), pages 39 – 54.

A vision is a clearly articulated statement that defines a destination or future state of affairs that an individual or group thinks desirable in the long term. A vision communicates an ideal view of the future and future orientation (and can provide the basis of a strategy on how to get there). Key elements of vision statement include:

- The *mission* or purpose of an organisation;
- The *strategy* for achieving that mission;
- Elements of the organisational *culture* that are necessary to achieve that mission and support the strategy.

A vision underpins and promotes organisational change by providing:

- Necessary preconditions for strategic planning;
- Criteria against which all strategic options are evaluated;
- A picture of the future against which to set the agenda for an organisation;
- Direction and purpose; and
- The basis for effective action

A set of 'visioning scenarios' can be used to capture a range of possible futures. By contrast with 'scenario planning' (see below), visioning scenarios focus on the internal organisation rather than on external factors, and on issues over which the organisation has control. By accounting for a diversity of opinion and by facilitating dialogue and trade-offs, 'visioning scenarios' may be an

effective way to agree upon a desirable 'destination'. A visioning exercise could provide a useful foundation for a strategy on access and benefit-sharing. It is a useful way to work with stakeholders to articulate an agreed-upon 'destination' for the conservation and sustainable use of genetic resources, and to identify the conditions necessary to facilitate a range of access and benefit-sharing partnerships.

3.3 STEEP – Social, Technological, Economic, Ecological and Political

One of the first tasks of a strategy team is to identify issues, trends and drivers that are likely to influence biodiversity, and, specifically, access and benefit-sharing, in the coming 10-20 years. One technique for doing so is an analysis of relevant Social, Technological, Economic, Ecological and Political (STEEP) factors. Examples of factors to consider, taken from the South African Biodiversity Foresight exercise (DACST, 1999) include:

- **Social factors:** poverty, resource use, urbanisation, population profile and growth
- **Technological factors:** biotechnology, information and communication technologies, indigenous knowledge systems
- **Economic factors:** market trends in other sectors (e.g. medicines, food and drink, tourism) and economic opportunities based on biodiversity (e.g. drug development)
- **Ecological factors:** knowledge generation and utilisation and understanding and management of biodiversity.
- **Political factors:** national policies and international and regional agreements.

3.4 SWOT – Strengths, Weaknesses, Opportunities, Threats

Source: Van der Heijden. K (1996), *Scenarios – the art of strategic conversation*, pages 133 – 158

SWOT analysis enables the development of strategic options that reflect internal capabilities and limitations and respond to the predicted business environment. SWOT data can be used to trigger open discussion on the options open to a company or country and the analysis can be used at various stages throughout the development of a strategy. It covers:

- **Strengths**: the favourable features of a company that enable it to succeed and be competitive;
- **Weaknesses**: problems with the basic running of the business, such as inadequate accounting or personel and also any lack of 'distinctive competancies' to give a company competitive edge.
- **Opportunities**: the opportunities presented by a company's portfolio of distinctive competencies and capabilities.
- **Threats**: unfavourable elements of a business environment that could undermine the strength of a company.

SWOT analysis on ABS can help to trigger dialogue between stakeholders on strengths the country can build on to optimise conservation and sustainable use of biodiversity, as well as identifying and eliminating barriers that could get in the way of achieving this goal.

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Factors for consideration in an Access & Benefit-Sharing SWOT analysis	
Strengths	**Weaknesses**
• Unique combination of genetic resources (high species diversity, high endemism) • Cultural diversity and indigenous and local knowledge of biodiversity • Well documented biodiversity and knowledge • Physical and legal accessibility of genetic resources and associated knowledge through streamlined access regimes • Good knowledge of potential markets for bioproducts, and associated costs, time-frame and risks of research and development • Clear legal framework (PIC, real and intellectual property and other rights and responsibilities) that minimise risk • Human and institutional capacity to support and collaborate with those seeking access (well developed science and technology skills) • Long-term conservation enabling resupply • Well-coordinated public sector • Well developed private sector • Well-organised civil society (enabling representatives of local and indigenous groups to be identified) • Clear priorities and mechanisms for benefit-sharing • Good public understanding of ABS issues • Experience of ABS arrangements and regulation • Political stability	• relatively low biological diversity • low endemism (so genetic resources available from many other sources) • loss of or little history of associated traditional knowledge • inaccessible, poorly documented and characterised genetic resources and associated knowledge • lack of understanding of the realistic economic potential of the genetic resources; little knowledge of current and potential markets • bureaucratic and under-resourced access procedures • lack of clear legal title to genetic resources and associated information, hindering identification of those from whom PIC is needed and with whom benefits should be shared • little human and institutional capacity to offer high-calibre scientific partnerships to access applicants • weak system of *in situ* and *ex situ* conservation • poor coordination between government departments • little experience of value-addition and weak private sector • little experience of management of IPRs • poorly organised or fragmented NGOs and organisations of civil society • little public awareness of ABS issues • little experience of ABS arrangements or regulation • frequent changes of government; lack of continuity of policy and personnel on ABS
Opportunities	**Threats**
• conducive international policy framework (commitments to sustainable development, acknowledgement in CBD of national sovereignty, prior informed consent, benefit-sharing, biodiversity strategies and mainstreaming) • markets for genetic resources in many different biomarkets – some of which (e.g. botanical medicines, biotechnologies, organic products) are likely to grow • clear identification of full range of benefits that can be gained from ABS partnerships (e.g. monetary, non-monetary – including information, participation in value-adding research, technology transfer, capacity building) and how these can contribute to sustainable development • ABS strategy can help maximise benefits in other sectors and through better coordination and 'joined up government' • ABS strategy can capitalise on advances in related sectors such as information technology • Opportunities to meet local priority needs by matching benefits to markets and by substituting locally manufactured natural products for expensive imported goods • 5-year window of opportunity to create ABS policy (including access legislation) that facilitates fair partnerships • positive PR (and facilitated access) for users seen to be 'good partners' complying	• inadequately regulated access to genetic resources can lose a country and its stakeholders a fair share of benefits and mean a country misses out on development opportunities • inadequately regulated access to genetic resources and traditional knowledge can lead to unsustainable resource use, theft or other abuse of property rights • lack of clarity in legal title and access regulations can inhibit domestic researchers and potential foreign partners from conducting valuable research, sending them elsewhere to find ABS partnerships or even encouraging them to break the law • unworkable, bureaucratic and unclear access regulations can stifle research, development and capacity-building within the country and prevent desirable international partnerships • slow response to formulating national strategy on ABS can mean a country has little influence on international best practice and is uncompetitive as others become preferred partners • inappropriate regulation and ill-informed expectations by stakeholders can mean countries forgo development opportunities (e.g. by pricing access to highly)

3.5 Five forces

Source: Porter, M.E. *Towards a Dynamic Theory of Strategy*, in Dyson, R.G. et al. (1998), pages 81 – 109.

A company's success or failure is influenced both by external factors and by its own actions. Porter suggests that the sustainability of a company can be tested against 5 'forces', which could also be useful angles for an ABS strategy team to consider:

- **Rivalry among existing competitors**. E.g. other countries which are able to supply a 'package' of accessible genetic resources and value-added services at least as attractive as that of the country in question and providers of products and forms of employment at least as attractive to domestic and foreign consumers as those produced in the country in question.
- **The threat of new entrants into the market**. E.g. other countries building their legal and institutional infrastructure to offer products and services related to genetic resources that compete with those of the country concerned.
- **Threat of substitute products or services**. E.g. developments in synthetic chemistry may lessen interest in natural products, and access to *ex situ* collections may remove the need for users to seek access to genetic resources in circumstances which trigger benefit-sharing.
- **The bargaining power of suppliers**. The bargaining power of a provider country will depend in part upon its biodiversity (see Section 4.4.2), but can be increased by building a legal and institutional infrastructure that encourages domestic and foreign applicants to enter into access and benefit-sharing agreements. The bargaining power of individual suppliers (from the local university to the start-up biotechnology company) can be strengthened by offering them information and training to assist them in negotiating beneficial ABS agreements.
- The bargaining power of buyers.

3.6 Cognitive mapping

Source: Warren, K. *Exploring Competitive Futures Using Cognitive Mapping,* and Eden, C. *Cognitive mapping and problem structuring for systemd dynamics model building*, in Dyson, R.G. et al. (1998), pages 209 – 224 and pages 227 – 242.

Cognitive mapping is a method to help depict the structure and origin of a problem by describing a network of cause and effect relationships. It identifies important drivers of change and follows possible consequences to their logical conclusion. It also seeks explanations for outcomes that have been observed but for which no cause has been identified. The technique can therefore assist in modelling a company's transactions, setting objectives, and aiding the formulation of strategic initiatives to achieve these. In making explicit not only the factors in the external environment influencing a business, but also the ways in which that business influences the external environment, cognitive mapping is a useful way to develop a 'feedback' view of strategy, i.e. a planning cycle.

Based on analysis of experience to date, cognitive mapping could be used to understand the transactions involved in developing and implementing access legislation and ABS partnerships. It may enable stakeholders to identify preconditions for developing good partnerships. This might include solutions to factors that hamper the development of good partnerships, e.g. lack of understanding between indigenous communities and industry (or between other stakeholders), or excessively high transaction costs due to bureaucracy. It could also help identify solutions to problems, such as and creation of new university courses to help build the capacity for scientific collaboration, investment in institutions and assistance for companies to support product development and manufacture; improvement of infrastructure to facilitate access to markets and decentralisation of some aspects of access regulation (e.g. Codes of Conduct for universities to follow, as in the Philippines) to reduce the transaction costs of access regimes.

3.7 Scenario planning

To mobilise people and resources, policy needs to be based on a narrative, or a story (Mayers and Bass, 1999). Scenario planning is about generating such stories. It can capture the richness of a range of possibilities, some of which are mutually exclusive, stimulating decision-makers to consider changes they would otherwise ignore. It organises possibilities into narratives that are easier to grasp than great volumes of data. Steps include defining the scope; identifying the major stakeholders; identifying key uncertainties and relationships between them; constructing the initial scenarios; checking these for consistency and plausibility; then, based on these, developing more detailed and strategically relevant scenarios to reflect possible trends. In order to work out strategies for deriving optimal benefits in the long term, it is important to assess the probability of each scenario materialising, as well as the winners and losers involved. Some general rules of thumb when developing scenarios are: (i) develop a set of scenarios that collectively account for the probable range of future outcomes and not necessarily the entire range; (ii) develop only a limited number of scenarios – preferably between 2 and 4; and (iii) develop only discrete scenarios, each with unique implications for strategic decision-making. Potential strategies can be tested for their robustness in the circumstances described by each scenario. Strategies that remain robust across several or all of the identified scenarios are likely to be most beneficial, whichever direction the future takes. Strategies can be adapted over time, so it is helpful to identify trigger events that show that events are heading towards one scenario or another. Three contrasting scenarios in ABS are available from the authors (contact k.tenkate@rbgkew.org.uk).

3.8 Delphi

The Delphi survey is a technique for consulting and obtaining the opinions of a wide range of stakeholders now commonly used in foresight and strategy exercises. A questionnaire is prepared by the strategy team, comprising a series of statements, grouped in categories, reflecting the most important issues for the sector. These are formulated as a description of an activity that could conceivably be achieved through research and technology over the next 20 years.

Examples of such statements taken from the South African Foresight exercise (www.dacst.gov.za/science_technology/foresight/index.htm) include 'Development of techniques to add economic value at local level to harvested or cultivated products (e.g. medicinal or food plants) and 'Increased international demand for 'greener' products opens opportunities to develop nature-based products (such as nutraceuticals, phytomedicines and biopesticides)'.

For each statement, respondents are asked to respond to six questions, namely.

1. The importance of the statement to the country in terms of (a) wealth creation and (b) quality of life (each ranked low, medium or high).
2. The country's standing in respect of this activity relative to (a) others in the region and (b) the rest of the world (each ranked 'behind' or 'equal/ahead').
3. The likely time frame for realisation of the statement (several options ranging from 'within 5 years' to 'beyond 20 years', or 'never').
4. How the country might acquire the necessary technology or capacity (develop itself, import the complete technology, engage in joint ventures, customise existing technology or considering the technology/capacity to be inapplicable).
5. The key constraints to realising the statement (technology, market, human resources, R&D infrastructure, policy, social/cultural or other).
6. The respondent's level of confidence in the answers supplied to the statement (high, medium, low), so that respondents with low levels of confidence in their ratings can be excluded.

TOOL KIT

The results for each statement were quantitatively analysed using an index based on the percentage of respondents rating the importance of each statement as ‘high’, minus the percentage rating it as ‘low’. A joint index was also used, based on the average of respondents’ ratings for each statement with respect to (a) wealth creation and (b) quality of life. This enabled the top 20 statements to be listed in descending order of importance. These statements, and associated information (e.g. on how respondents felt the necessary technology and capacity should be acquired, and over what timescale) formed the basis for the foresight report’s conclusions. An equivalent process could help identify core elements of an ABS strategy.

TOOL KIT

4. TOOLS FOR FORMULATING AN ACTION PLAN, AND FOR MONITORING AND EVALUATION

4.1 Logical framework (logframe) analysis

Logical framework (logframe) analysis, as used by donors including the UK Department for International Development (DfID), provides a useful tool for action planning, in particular if designing action plans as a series of budgeted projects.

In relation to a specific *goal*, logframe analysis helps identify:

- what a project is trying to do (*purpose*);
- what the project will need to do to achieve this purpose (*outputs*);
- what needs to be done to produce these outputs (*activities*);
- what resources are needed to perform those activities (*inputs*); and,
- what success will depend on.

The DfID approach to Logical Frameworks (see also www.dfid.gov.uk):

	Objectively Verifiable Indicator	**Means of Verification**	**Important Assumptions**
Goal Wider problem the project will resolve	Quantitative ways of measuring or qualitative ways of judging achievement of goal	Cost-effective methods and sources to quantify or assess indicators	External factors necessary to sustain objectives in long term
Purpose Immediate impact on the project area or target group (change or benefit)	Quantitative ways of measuring or qualitative ways of judging achievement of purpose	Cost-effective methods and sources to quantify or assess indicators	External conditions necessary if project purpose is to contribute to project goal
Outputs Specifically deliverable results	Quantitative ways of measuring or qualitative ways of judging achievement of outputs	Cost-effective methods and sources to quantify or assess indicators	Factors out of project control which could restrict outputs from achieving project purpose
Activities Tasks to be done to produce the outputs	Ways to make quantitative measurement of qualitative judgement	Cost-effective methods and sources to quantify or assess indicators	Factors out of project control which could restrict activities from achieving outputs.
Inputs To carry out activities – budget, training, equipment, people, transport, etc.	Periodic financial reports.		

Completing a logframe is a three-step process:

- *What do you want to do*? - work down the column of goals, purpose, etc..
- *How can you measure your progress*? - work across the matrix for each objective.
- *What assumptions are you making*? – reflect back up the matrix.

(1) What do you want to do?

- The **goal** defines the problem that a project will resolve, yet will be beyond the scope of that project as budgeted. In this case, the 'goal' might be a preferred option for achieving an

element of the core ABS strategy (see Section 4.5), e.g. '*A complete inventory of plant genetic resources within the national protected areas system*'.

- The **purpose** defines the immediate impact of a project, and needs to be 'SMART': **Specific**, **Measureable**, **Achievable**, **Realistic** and **Time-Bound**, e.g. '*A central database to be established at (National Parks Authority) by (date), linking accession records of national and university herbaria.*''
- The **outputs** define the specifically deliverable results of a project. These also need to be SMART and should clearly relate to the purpose. There may be several, e.g. *'Accession records of all national and university herbaria in electronic format by (date)'.*
- The **activities** define the tasks a project will perform to fulfill the outputs, and should also be SMART. There may be several per project output e.g. '*Train database manager in each herbaria by (date)*'.
- The **inputs** (what is required to carry out the activities). There may be several per activity. In addition to a budget, these might include funds, training, staff requirements, materials and transport.

(2) How can you measure your progress (objectively verifiable indicators)?

To assess change brought about a project, two kinds of indicator are required:

- **Progress indicators** - these measure the extent to which stated objectives have been achieved, e.g. the number of ABS partnerships successfully established by (date). Indicators of progress can be either quantitative (how many, or by how much), e.g. the number of indigenous communities involved in ABS partnerships using ethnobotanical knowledge; or qualitative (the kind of change), e.g. that access seekers have sought the consent of indigenous communities before gathering and using ethnobotanical knowledge.
- **Impact indicators** - these measure the impact of a project, e.g. the number of ABS partnerships that have generated royalties.

Indicators can either make direct measurements, e.g. the number of applications for access to genetic resources received by (Government Agency) by (date); or indirect/ proxy measurements, e.g. staff time spent by (Government Agency) assessing access agreements per year.

To effectively assess progress on the ground, indicators should ideally be chosen in partnership with stakeholders whose lives will be directly affected by a project (see Section 5.2 on participatory monitoring and evaluation). However, a wide variety of alternative indicators are likely to be tabled. Agreement on which to chose requires agreement over means to **verify** them, including:

- how information will be gathered;
- who bears responsibility for gathering information, e.g. stakeholder task forces;
- whether they have the time and resources;
- what the cost implications are; and,
- how monitoring and evaluation will be managed, e.g. reporting requirements to an interagency committee.

(3) What assumptions are you making?

What external factors could affect the project from having its desired impact? Factors may be environmental, political, economic or social, e.g. there is sufficient global demand for botanical medicines to warrant investing in laboratory capacity to develop and manufacture them. If there is so much risk that a proposed project may not succeed, it will either need to be redesigned or abandoned in favour of an entirely alternative approach. Guyana's National Biodiversity Action Plan (1999) identifies '*acceptance by the developed countries, their agencies and institutions*' as the risk/ assumption for a project to upgrade national legislation on ABS.

TOOL KIT

4.2 Process and content indicators for fair and equitable benefit-sharing

From ten Kate. K and S. A. Laird (1999), pages 330 – 331.

Process indicators (negotiation):

- Were the benefits identified and defined jointly by the provider of genetic resources and the user?
- Was there PIC for access?
- Were all affected parties (e.g. government, research institutions, local communities) represented in provider's granting of consent?
- Are provider and user clear which variable affect the type and value of benefits agreed?
- Is it clear from the agreement which benefits were precisely defined at the time that the agreement was made, and which benefits must be defined later in the partnership once the use of genetic resources becomes clear?
- If some of the benefits are to be defined after the initial agreement has been made, is there a process stipulated in the initial agreement for reaching agreement during discovery and development on the type and value of benefits?
- Was the agreement based on full disclosure by the user of how it intends initially to use the genetic resources, and a process determined by which other uses might be approved by the provider?
- Did both the provider and the user of genetic resources have available to them the information enabling them to asses the likely value of the results of access (including the probability of success of a commercial product and the likely size and value of the market for the product)?
- Did both the provider and the user of genetic resources have available to them the negotiating skills and legal assistance needed to reach agreement?

Content indicators:

- Are both monetary and non-monetary benefits included in the agreement?
- Are benefits shared at different points in time, from initial access, through discovery and development, and for the duration of sale of a product?
- Are benefits distributed to a range of stakeholders?
- Does the agreement include a 'package' of different benefits?
- Is the agreement based on the standard terms of either the provider or the user of genetic resources, or was it tailored to the specific needs of both parties?
- Does the magnitude/ value of benefits vary according to the degree of exclusivity of access?
- Does the magnitude/ value of benefits vary according to the value added to the genetic resource by the provider (whether by supplying derivative of the raw genetic resources, such as purified compounds, or by providing information concerning the raw genetic resources, such as ethnobotanical information on data or traits?)
- Is a mechanism established for the distribution of benefits within the provider country over time?
- Is benefit-sharing linked to a set of objectives or principles (e.g. conservation of biodiversity, sustainable development) that addresses wider national, as well as local and international priorities?

APPENDIX

PART 1: THINKING STRATEGICALLY ABOUT ACCESS AND BENEFIT-SHARING

1.1 Demand for access to genetic resources

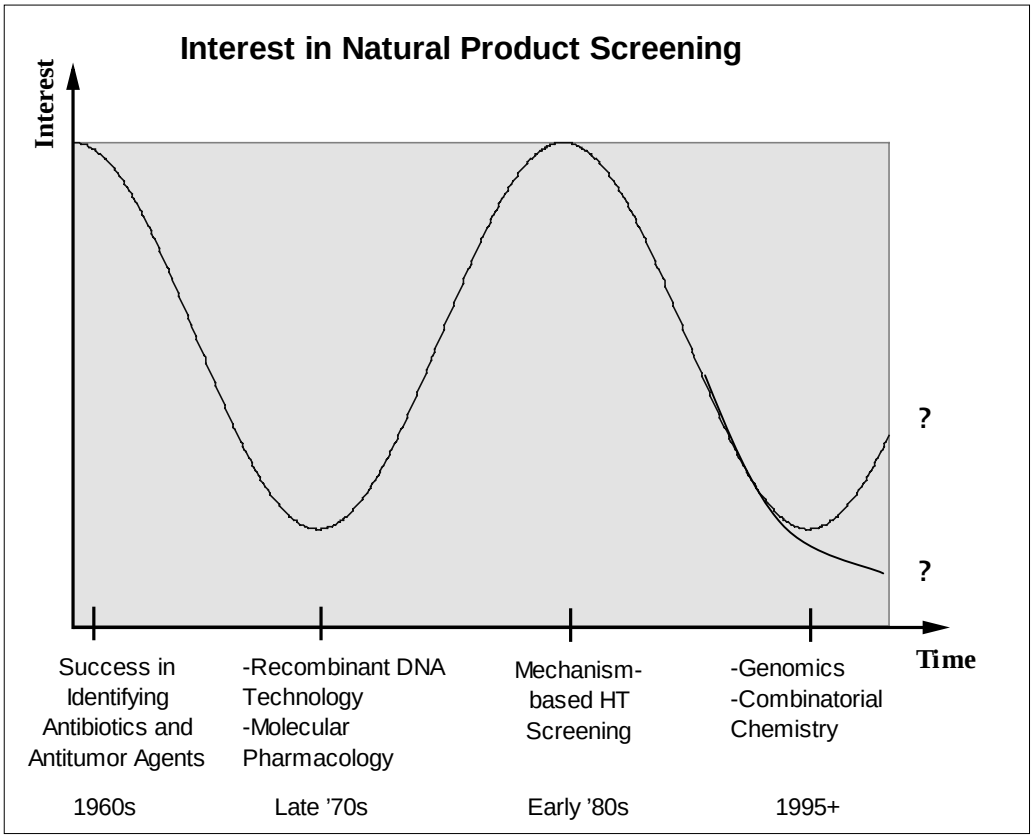
Box 10: 'Ballpark' high and low estimates for annual markets for various categories of product derived from genetic resources

Source: ten Kate and Laird (1999)

Sector	Market/ US$bn LOW	Market/ US$bn HIGH	Notes (For more detail, please see ten Kate and Laird, 1999. *Corresponding chapters indicated in brackets.)*
Pharmaceuticals	75	150	Some products derived from genetic resources. Low estimate: natural products form 25% of global market. High estimate: 50%. *(Ch.3)*
Botanical medicines	20	40	All products derived from genetic resources. *(Ch. 4)*
Agricultural produce (Commercial sales of agricultural seed)	300+ (30)	450+ (30)	All products derived from genetic resources. Low estimate: final value of produce reaching consumer 10x commercial sales of seed to farmers. High estimate: 15x commercial sales of seed to farmers. *(Ch. 5)*
Ornamental horticultural products	16	19	All products derived from genetic resources. Low estimate: based on available data. High estimate: allows for unreported sales and products. *(Ch. 6)*
Crop protection products	0.6	3	Some products derived from genetic resources. High estimate includes wholly synthesised analogues, as well as semi-synthesised products. *(Ch. 7)*
Biotechnologies in fields other than healthcare and agriculture	60	120	Some products derived from genetic resources. Low and high estimates based on assessments of environmental biotechnologies. *(Ch. 8)*
Cosmetics and personal care products	2.8	2.8	Some products derived from genetic resources. Including cosmetics, 'natural' products. *(Ch. 9)*
Rounded total:	**500**	**800**	

The following diagram illustrates how shifts in technology can affect demand for access to genetic resources.

APPENDIX



1.2 Experience with access and benefit-sharing regimes

Access regimes set in place legal, institutional and procedural frameworks. These include the designation of competent national authorities to negotiate contractual access agreements, as well as the requirement to obtain the Prior Informed Consent (PIC) of both the State and other providers, such as protected area authorities and indigenous peoples. Some countries have also introduced compliance measures, such as the requirement to produce evidence of PIC where applicants for patents and plant breeders' rights have used genetic resources and associated knowledge, e.g. Peruvian Supreme Decree 008-96-ITINCI**,** and Andean Community Decision 486 (Ruiz, M. 1997; GRAIN, 2000)

Regions and countries with, currently designing, or planning to introduce access legislation (as at February 2001)

ASEAN, Argentina, Australia (Commonwealth, W. Australia and Queensland), Belize, Bolivia, Brazil, Cameroon, China, Colombia, Costa Rica, Cote d'Ivoire, Cuba, Ecuador, El Salvador (planning), Eritrea, Ethiopia, Fiji, The Gambia, Ghana, Guyana, Guatemala, Hungary, Iceland, India, Indonesia, Kenya, Laos, Lesotho, Malawi, Malaysia (including States of Sabah and Sarawak), Mexico, and Mozambique, Namibia, Nigeria, Organisation of African Unity, Pakistan, Panama, Papua New Guinea, Peru, Philippines, the Republic of Korea, the Russian Federation, Samoa, Seychelles, Solomon Islands, South Africa, Sri Lanka, Tanzania, Thailand, Uganda, USA (within national parks), Vanuatu, Venezuela, Vietnam, Yemen and Zimbabwe.

Countries underlined are megadiversity countries. Of the two megadiversity countries not already on this list, Madagascar is changing its administration of access and is likely to work on access laws in the future, and the authors do not know of the position in the Democratic Republic of Congo. Sources: RBG Kew communications with countries; Glowka, L. pers. comm. 9 Feb 2000; Glowka. L. (2000).

APPENDIX

1.3 Issues related to countries' roles as users and importers of genetic resources

Assessment of demand for and use of genetic resources and current practice in benefit-sharing: Policy-makers exploring their country's role as a user and importer of genetic resources should ensure that they are aware of:

- the extent and nature of demand by domestic scientific and commercial stakeholders for access to genetic resources from other countries;
- how and on what terms they acquire them (e.g. from *in situ* conditions or *ex situ* collections; the nature of resources exchanged (e.g. raw materials/value aded products); and common terms of the permits and agreements under which they are acquired);
- whether domestic users are confident they know how to acquire genetic resources from abroad legally and whether access processes are clear and workable; and
- what is current practice in sharing benefits with foreign providers of genetic resources.

Laws on access and benefit-sharing: Until recently, there has been little sign that governments have contemplated introducing legislation on access and benefit-sharing that would help enforce access and benefit-sharing agreements and access measures taken by other countries. This may change when countries ratify any revised International Undertaking on Plant Genetic Resources for Food and Agriculture (IU). National (or regional) legislation requiring domestic stakeholders to comply with the provisions of the IU may be required. In addition, a number of legislative and policy options through which countries could implement Articles 15 and 16 of the CBD were examined in a study commissioned from Environmental Resources Management by the Environment Directorate of the European Commission (contact Anouk Ramsey at ERM, 8 Cavendish Square, London W1M 0ER).

Guidelines and codes of conduct: There are some 47 voluntary Codes of Conduct and sets of guidelines related to access and benefit-sharing which set standards for collectors, importers and users of genetic resources Some have been developed specifically to address the ABS provisions in the CBD and access legislation. These include: the Common Policy Guidelines for Participating Institutions on Access to Genetic Resources and Benefit-Sharing (see http://www.rbgkew.org.uk/conservation/agrbs-policy.html); the Draft Guidelines on Access and Benefit-Sharing Regarding the Utilisation of Genetic Resources prepared by the Swiss government (see UNEP/CBD/EP-ABS/2/INF/1); and the Micro-Organisms Sustainable Ese and Access Regulation International Code of Conduct (MOSAICC) (www.belspo.be/bccm/mosaicc/ or contact Philippe Desmeth, Belgian Coordinated Collections of Microorganisms, at <desmeth@mbla.ucl.ac.be>) .

IPRs: Some countries are introducing provisions in legislation related to IPR that concerns disclosure of country of origin in applications for intellectual property rights, which could support those wishing to enforce access and benefit-sharing agreements. For example, the European Biotechnology Directive (Directive 98/44/EC) contains provisions in its (non-binding) Preamble encouraging disclosure of country of origin in patent applications based on genetic resources. In addition, Andean Community Decision 486 requires proof of PIC from local communities when filing patents on products or processes based on indigenous knowledge (Art. 26) (GRAIN, 2000).

Grants and funding mechanisms: Governments could consider establishing grants, funding mechanisms or loans to support applicants wishing to establish and disseminate fair and equitable research partnerships involving ABS. An example is the International Cooperative Biodiversity Group initiative supported by the US government. (see (ICBG) http://www.nih.gov/fic/programs/icbg.htm)

Public awareness initiatives: Since many universities, *ex situ* collections, research institutes and companies are not well informed upon the CBD, national laws and policies on ABS and their implications, measures to increase awareness in the scientific and commercial sector would be

helpful. These could encourage domestic users of genetic resources from overseas to respect the CBD and access laws around the world. Such initiatives might include: meetings with industry associations; communications with the research councils and other organisations that administer grant applications and fund research; the preparation and distribution of leaflets to travellers by Customs and Excise; and the provision of information in diplomatic missions overseas on a country's ABS measures, to inform foreign citizens hoping to access its genetic resources.

PART 2: GETTING STARTED

2.1 A body to co-ordinate the strategy process: national experiences with interagency committees

Interagency committees to co-ordinate a strategy process might include: central government agencies; provincial government departments; NGOs, including community organisations; and scientific research and educational institutions.

Some developing countries have established interagency committees to develop and implement ABS law and policy. Costa Rica's Biodiversity Law ('Ley de Biodiversidad 7788') established the National Commission for the Management of Biodiversity, a decentralised, interagency body under the Ministry of Environment and Energy (MINAE), to formulate and coordinate policies on ABS. An Inter-Agency Committee on Biological and Genetic Resources co-ordinates implementation of Philippines Executive Order 247 on access to genetic resources. The Committee is co-chaired by the Department for the Environment and Natural Resources, and the Department for Science and Technology. It also includes representation from three other government agencies (agriculture, health and forestry), the National Museum, the scientific research community, NGOs and indigenous peoples' organisations (Swiderska et. al., 2001).

Co-ordinatory bodies may also be required at the subnational level to account for local government structures and NGOs. For example, India's NBSAP process incorporates cross-sectoral steering and advisory committees at national, state and sub-state levels. Each committee has representation from relevant government agencies, NGOs and independent experts (Kothari, 2000).

Designing a coordinatory body can, however, be one of the trickiest parts of the strategy process, given the need to identify and represent all necessary 'voices' within a workable structure.[24] When developing its Biodiversity White Paper (which includes provisions on ABS), South Africa chose to appoint both a 4-person Steering Committee and 28-person Reference Group. The Steering Committee consisted of the national Department of Environmental Affairs and Tourism (DEAT), the Senate Portfolio Committee on Environmenal Affairs, an NGO working on natural resource issues and the project's principal funders - Danish Cooperation for Environment and Development (DANCED). It was tasked with day-to-day management and implementation of the policy process. The Reference Group acted as the primary decision-making body for the policy consultation and drafting process, representing: parliament (2 representatives); national and provincial government departments (4 and 12 respectively); parastatal organisations, including users of biodiversity (2); NGOs, both traditional and 'social' (7); and traditional healers (1). The Reference Group was tasked with: (a) guiding the Steering Committee; (b) accepting responsibility for the consultation process; and, (c) ensuring that the content of the policy adequately reflected the concerns and interests of stakeholders. Initially selected by the Steering Committee, the Reference Group subsequently altered its own membership to improve its representation (Wynberg and Swiderska, 2001).

[24] Pers. comm., Rachel Wynberg (9 April 2001).

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2.3 Legal initiatives relevant to an ABS strategy:

2.3.1 Consultative processes for the design of laws on ABS and biodiversity

Certain countries have sought stakeholder input in the design of their access measures. Australia's Voumard Inquiry into 'Access to Biological Resources in Commonwealth Areas' consulted environmental, indigenous, industry and research interests, through interviews and public hearings (Voumard, 2000). The Inquiry noted that '*many stakeholders would benefit from further opportunities to understand* [access] *issues and, particularly where they will be directly affected by* [a scheme on access to biological resources]*, to contribute to its development and implementation*.' Other examples include the Philippines Executive Order 247 (1995), India's draft Biodiversity Bill (2000) and Costa Rica's Biodiversity Law 7788 (1998).

In some countries, participation in the development of ABS law and policy has been unprecedented, provoking extensive discussion amongst domestic industries, NGOs, academics and research institutions, as well as local communities (Swiderska, 2000). But in others, consultation has been *ad hoc* and over-centralised, with little direct involvement of local government officials, scientific researchers, and the private sector, and a lack of institutionalised structures for consultation of local and tribal communities (Swiderska, Duboir and Dano, 2001; Anuradha, et. al., 2000).

2.3.2 Intellectual Property Rights (IPRs) and ABS

Many countries developing ABS frameworks are also consolidating their IPR laws in line with the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (IPRs). Potential areas of synergy between IPRs and ABS include:

- ***Prior Informed Consent (PIC) for access***: contractual obligations to seek the PIC of providers before acquiring IPRs on products or processes based on genetic resources and associated traditional knowledge; legal requirements that proof of PIC be presented when filing patents e.g., as required under Andean Community Decision 486 (Art. 26), (GRAIN, 2000).
- ***Mutually agreed terms for benefit-sharing***: joint patent rights for users and providers arising out of joint R&D; licensing of inventions for development, commercialisation and use; shares in royalties derived from licensees; technology transfer on concessional terms.

At the same time, countries are developing UPOV-based or *sui generis* systems for Plant Variety Rights (PVRs), in line with TRIPs Article 27.3 (b). Some have chose to integrate ABS provisions into these systems, e.g. Namibia is drafting a combined Act on ABS and PVRs,[25] and Peru's Supreme Decree 008-96-ITINCI requires proof of consent for access on applications for plant varieties using genetic resources sourced in that country (Ruiz, 1997).

In addition, countries are looking to develop systems for the recognition and protection of traditional knowledge, innovations and practices. These initiatives span:

- the availability, scope and use of indigenous knowledge rights;
- mechanisms to promote the use of such knowledge, subject to the prior consent of providers;
- and equitable benefit-sharing.

Examples include Peru's consultative process to develop a regime protecting the collective knowledge of indigenous peoples, and South Africa's Draft Bill on the Protection and Promotion of Indigenous Knowledge. A handful of countries have developed laws governing access to traditional medicinal knowledge. The Philippines Traditional and Alternative Medicine Act (TAMA, 1997) requires benefit-sharing with communities that provide traditional knowledge. Sri Lanka's

[25] Access to Biological Resources and Associated Traditional Knowledge Act, Draft 6 June 2000.

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Draft Legal Framework on Access to Traditional Knowledge relating to the Use of Medicinal Plants, covers access to traditional *ayurveda* knowledge, the equitable sharing of benefits deriving from its use, and its registration in a proposed Register of Traditional Knowledge.

2.4 Policy initiatives that have addressed ABS

The following sections provide examples of policy initiatives that account for ABS, specifically:
- National Biodiversity Strategies and Action Plans;
- Technology foresight programmes; and,
- Biotechnology strategies.

2.4.1 National Biodiversity Strategies and Action Plans

NBSAPs are GEF-funded Biodiversity Enabling Activities.[26] Additional Enabling Activity funding has now been approved to address capacity building priorities for ABS (GEF, 2000).[27] Two categories of country might benefit from comprehensively addressing ABS within the scope of their NBSAPs:
- countries currently initiating their NBSAPs;
- countries undertaking second-round biodiversity planning exercises, e.g. Vietnam intends to address ABS within the provincial biodiversity action plans that will follow its NBSAP.[28]

Most countries with NBSAP provisions on ABS have yet to introduce access legislation, and their strategies call for the design and implementation of comprehensive access laws and policies. As a country that both uses and provides genetic resources, New Zealand's NBSAP acknowledges that it needs to develop policy measures governing access both at home and abroad. Belize's calls for the introduction of 'policies, laws, enforcement mechanisms and [an] institutional framework necessary to regulate access to genetic resources and traditional knowledge', as well as mechanisms for equitable benefit-sharing. Gambia's draft NBSAP calls for the establishment of an inter-agency committee to oversee regulation of ABS. Other NBSAPs that high-light the development of legal and institutional measures on access, include those of Australia, Guyana, Uruguay, Poland, Cameroon, Seychelles, Kenya, Spain, and Pakistan. Many also specify participation in international negotiations over ABS.

A small number of other countries are currently preparing, or planning to develop, detailed NBSAP components on ABS to support the design and implementation of ABS legislation. South Africa's NBSAP will address access agreements, PIC and benefit-sharing mechanisms.[29] India's National Biodiversity Action Plan will provide an implementing framework for the country's draft Biological Diversity Bill (2000), and will address ABS at local, state, and national levels (Anuradha et. al., 2000). Namibia developed its draft Act on Access to Biological Resources and Traditional Knowledge concurrently with its NBSAP provisions on 'biotrade', and the two will be implemented in tandem.[30] Bolivia's NBSAP component on genetic resources will help consolidate the legal and institutional framework for ABS established by its Regulation on Andean Pact Decision 391 (see Case Study).[31] Costa Rica's NBSAP contains provisions to 'facilitate' ABS within the framework of Biodiversity Law 7788. These include measures to clarify intellectual property rights, and the distinction between commercial and non-commercial access activities, as well as to develop the capacity of Costa Rica's competent national authority on access.[32] Madagascar's draft NBSAP

[26] Implemented by the World Bank, UNDP and UNEP.
[27] This brings the total available funding per country for NBSAP development to US$450,000.
[28] Pers comm. Dr Balakrishna, IUCN South and South-East Asia (May 2000).
[29] Dr Maureen Wolfson, NBI, presentation at COP5 lunchtime workshop, Strategic Planning for Access and Benefit-Sharing, Nairobi, 17 May 2000.
[30] Pers. comm. Drs Phoebe Barnard and Michaela Figueras, MET, Namibia at GBF May 2000.
[31] The Philippines NBSAP does not, however, refer to access, despite being for the very first country to introduce access legislation. Pers comm. Mr Tony La Vina, WRI, February 2000.
[32] Costa Rica, Estrategia Nacional de Biodiversidad (February 2000), Section 3.3

highlights the need to consolidate existing procedures for authorising access, as well as to adapt these for decentralisation.

Most NBSAPs that address ABS also highlight associated capacity-building. For example, Bhutan's Biodiversity Action Plan sets out a programme of incremental capacity development, including upgrading the National Herbarium, and taxonomic and higher-degree training, as a basis for future ABS partnerships. Colombia's NBSAP provisions on access highlight capacity to negotiate partnerships, measures to promote value-added development of genetic resources, and the consolidation of Colombian natural-product industries to improve their competitivity. Madagascar's draft NBSAP component on ABS addresses enterprise development by local producers, including the use of plant variety rights, Geographical Indications and certification for Malagache natural products. It also calls for the development of capacity to manage and provide advice on access contracts, technology transfer and information exchange.

But even where NBSAPs make no explicit reference to ABS, most contain relevant capacity-building provisions. These include provisions on: developing *ex situ* collections; training in taxonomy and systematics; inventorying and evaluating biodiversity and associated traditional knowledge; defining collective intellectual property rights; protected area management; information exchange and technology transfer mechanisms; as well as the promotion of product development and marketing. By targeting these provisions, an ABS strategy process might help to mobilise NBSAP implementation, especially if it results in the development of equitable, capacity-building partnerships.

2.4.2 Technology Foresight Programmes

A growing number of countries, including South Africa, Japan, the United Kingdom, the Netherlands, France and Denmark, have initiated technology foresight programmes. Foresight involves a systematic attempt to look into the longer-term future of science, technology, the economy, the environment and society. It identifies emerging technologies and areas of strategic research, likely to yield the greatest economic, environmental and social benefits (ATSE, 1999). Foresight programmes span training and education, agriculture and food, energy, biodiversity and sustainable development, health, financial services, information technologies, manufacturing, chemicals, mining, crime and defence. Foresight Initiatives present an important opportunity to improve competitiveness through ABS, as illustrated by the biodiversity sector report of South Africa's foresight initiative (DACST, 1999).).

The biodiversity component of South Africa's National Research and Technology Foresight Project (1999)

South Africa's Foresight Mission is to '*promote technological innovation and deployment by identifying opportunities for economic and social development through a national research and technology foresight project*'. Completed in 1999, the Foresight development process was guided by a White Paper on Science and Technology. It spanned 12 different sectors, including a comprehensive component on biodiversity – an area identified as strategically important, given South Africa's status as a 'megadiversity' country. The 1997 White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity gave this component added weight. The Project's sectoral mission on biodiversity is to ensure *'adequate and strategic investment into research and technology for the conservation, utilisation and beneficiation of South Africa's biological diversity, thereby enabling this resource to contribute effectively to South Africa's socio-economic development in the next 10 – 20 years'*. Key technologies and R&D areas were identified to: (i) improve knowledge and public understanding of biodiversity; (ii) manage biodiversity; and (iii) develop novel products, processes and services from biodiversity. Of 11 recommendations set out in the biodiversity sector report, some may greatly enhance South Africa's competitive edge in ABS, including technologies and R&D to enhance species inventory, valuation and value-addition of biodiversity, equity and access to biological resources, integrated indigenous knowledge systems, and the development of biotechnology products.

Source: Department of Arts, Culture, Science and Technology (DACST), South Africa (1999)
www.dacst.gov.za/science_technology/foresight/index.htm

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2.4.3 Biotechnology strategies

The growing number of national strategies on biotechnology addresses: transparent regulation of gene technology; mechanisms to manage the risks associated with gene technology; training and education; enterprise development; investment in R&D; stronger links between research and industry; and IPR.[33] Australia's National Strategy for Biotechnology (2000) Strategy also identifies access to genetic resources as a basis for biotechnological innovation.

Synergies between Australia's National Strategy for Biotechnology (2000) and the Voumard Inquiry into Access to Biological Resources in Commonwealth Areas (2000)

Australia's Biotechnology Strategy (2000) identifies access to genetic resources as part of the infrastructure required to promote biotechnology R&D. Among the Strategy's objectives is the *'development of measures to enhance access to Australia's* [marine and terrestrial] *biological resources*'. It also identifies 6 strategies to achieve this:

- *'Resolve legal issues on the ownership of Australian biological resources';*
- *'Work with sectoral interests to identify their resource needs in biotechnology, including the utilisation of Australian indigenous and exotic biological resources';*
- *'Work with the States and Territories to achieve nationally consistent regimes on access';*
- *'Develop appropriate documentation, management and access protocols';*
- *'Address matters involving indigenous peoples and their ownership of biological resources';*
- *'Address issues of access to biological resources within Commonwealth* [Federal] *areas, including through regulations under the Environmental Protection and Biodiversity Conservation Act 1999*'

In July 2000, Australia completed a Commonwealth Public Inquiry into Access to Biological Resources in Commonwealth Areas (the Voumard Inquiry). The Inquiry's findings form the basis a proposed ABS scheme, to consist of an access permit and benefit-sharing contract.

The concerns of industry are clearly reflected in the Inquiry's terms of reference. These require an ABS scheme to operate '*in a manner that promotes certainty for industry and facilitates access to biological resources for environmentally sound uses*'. A press release announcing the inquiry stated that, '*access to biologial and genetic resources for environmentally sound uses is of strategic importance to Australia's capacity to develop a biotechnology industry. The inquiry will therefore look at options for implementing a streamlined access regime that, consistent with the principles of ecologically sustainable development, delivers certainty for industry*'.

Sources: *Australian Biotechnology – a national strategy* (2000), Commonwealth of Australia; Voumard, J. (July 2000), *Access to Biological Resources in Commonwealth Areas*, Commonwealth Public Inquiry.

2.5 Funding the development of an ABS strategy

There are a variety of funding options to support the development of ABS strategies: These may include:

- Starting with a small-scale, initial strategy within the means of available financial resources and/or that requires modest investment from donors;
- Integration into the investment programmes of government agencies responsible for science and technology, or trade and industry;
- Donor co-ordination to ensure that, in supporting selected elements of an ABS strategy, together they provide sufficient coverage to implement the whole;
- GEF Additional Funding for Biodiversity Enabling Activities (February 2000 guidelines), for assessing capacity building needs and defining country specific priorities for ABS, specifically: (1) assessment of existing policy measures and institutional/ human capacity

[33] *Australian Biotechnology – a national strategy* (2000), Commonwealth of Australia, page 7.

related to ABS; (2) formulation of ABS mechanisms; (3) developing measures for ABS; and (4) preservation and maintenance of biodiversity related knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles.

- Environmental Trust Funds that solicit and manage funds from various sources (including bioprospecting). *Strategy funds*, e.g. Bolivia's Fondo Nacional para el Medio Ambiental (FONAMA), support a full range of activities including national environmental plans, whereas *park* and *grant funds* are more area- and issue-specific (GEF, 1999, Bayon et. al., 2000).

For a useful overview of funding mechanisms, see: Bayon, R., J. S. Lovink and W. J. Weening (2000), 'Financing Biodiversity Conservation', Sustainable Development Department Technical Papers Series, Inter-American Development Bank, Washington, D.C..(Reference No. ENV-134). See also: GEF (1999) Evaluation Summary Report #1-99. Experience with Conservation Trust Funds.

PART 3: ASSESSMENT

3.1 Global biodiversity assessments

Global assessments of biodiversity to which countries may have contributed information include:

- the Global Biodiversity Assessment (1995) - this focuses on assessing scientific understanding of biodiversity's components, and contains sections on inventorying and monitoring of biodiversity, the resource basis for biodiversity assessments, data and information management and communication;
- the Global Biodiversity Outlook - a summary of the status of biological diversity and an analysis of current measures for conservation, sustainable use and ABS. Coordinated by the Secretariat, the first edition will be published in the second half of 2001.
- the Global Biodiversity Information Facility managed by the OECD, including research, biodiversity inventories, etc. - see: www.oecd.org/ehs/icgb/biodiv8.htm;
- the State of the World's Plant Genetic Resources prepared by the FAO for the International Technical Conference on Plant Genetic Resources held in Leipzig in 1996, based on national contributions - see: ftp://ext-ftp.fao.org/waicent/pub/cgrfa8/GS/SwpgrE.pdf;
- the Millennium Ecosystem Assessment - a global scientific assessment of ecosystems launched by the UN General Assembly in September 2000, and will include regional, national and local assessment. Groundwork has been laid by the UNEP/UNDP/World Bank/WRI Pilot Analysis of Global Ecosystems (forest, coastal and marine, agricultural, freshwater and grassland ecosystems); and,
- the Forest Resources Assessment 2000, implemented by the FAO and the United Nations Economic Commission for Europe (UN-ECE). The FAO Forest Resources Assessment Programme maintains the Forest Resources Information System (FORIS) which archives forestry data from the developing world. The Assessment includes non-timber forest products

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3.2 Assessing genetic resources: Costa Rica's National Biodiversity Inventory

Costa Rica's National Biodiversity Inventory aims to: develop a national reference collection; integrate national and international scientists in the inventory process; create national capacity to undertake inventory; and involve local communities in the study and sustainable management of biodiviersity. The Inventory process concentrates mainly on conservation areas,[34] focusing on eight taxonomic groups. Basic information is generated by 'parataxonomists' – members of communities living adjacent to national parks with training in biology and ecology, taxonomy, evolution, collection and preservation techniques, equipment maintenance, administration, etc. Information is gathered at 26 Biodiversity Offices in various Conservation Areas, and brought to Costa Rica's Instituto Nacional de Biodiversidad (INBio) on a monthly basis, for curation and taxonomic identification. In 1996 alone, 428,000 entomological specimens were collected, increasing the national reference collection to more than 2 million insects. Of these, 710,000 have been identified to the species level. In addition to species identification, information is gathered on species' habitats and distributions to facilitate conservation and management (Mateo, 2000; www.inbio.ac.cr).

3.3 Assessing associated traditional knowledge: The People's Biodiversity Registers Programmes in Kerala, India

People's Biodiversity Registers are an initiative sponsored by WWF-India, and co-ordinated by the Centre for Ecological Sciences of the Indian Institute of Science (IISc) and the Foundation for Revitalisation of Local Health Traditions (FRLHT). They aim to:

- record local knowledge associated with biodiversity for current and future use of the communities who develop them;
- revitalise local knowledge, including inter-community transfer of knowledge;
- focus conservation efforts around threatened local resources; and,
- protect biodiversity and associated knowledge from appropriation without local consent.

The Registers record 10 categories of information: (i) user groups; (ii) habitats; (iii) local ecological history; (iv) extent and distribution of local and collective knowledge about biodiversity components; (v) abundance/ scarcity and distribution of species; (vi) use of living resources (subsistence and/or commercial); (vii) regulation of use by local communities and government agencies; (viii) development aspirations of local communities; (ix) divergences and agreements amongst local communities over management; (x) emerging options for natural resource management.

A network of databases linking these registers will eventually be created, with clear recognition of origin. Each Register is periodically up-dated, and is held by a local elected council (*panchayat*). It is proposed that each district will have a computerised repository of local Registers. Access to the information on Registers will be regulated to promote benefit-sharing with source communities. For example, draft access legislation in the State of Karnataka would allow *panchayats* to collect fees from bioprospectors wishing to use information on Registers.

Source: Downes, D. R. and S. A. Laird, Community Registers of Biodiversity-Related Knowledge. The Role of Intellectual Property in Managing Access and Benefit-Sharing'. Prepared for UNCTAD Biotrade Initiative, March 1999. Now in Laird, S. A. (2001).

[34] Some protected areas host biological research stations, e.g. in the Beni Biosphere Reserve in Bolivia, which undertake important biological inventory work. However efforts to develop high-tech laboratories in protected areas risk drawing valuable resources away from national universities, which may be more natural places to train students, develop databases and build other R&D capacity over time (pers. comm. Sarah Laird 2 April 2001).

APPENDIX

PART 4: FORMULATING A STRATEGY

4.1 A conducive policy framework – clear procedures for obtaining Prior Informed Consent

An important strategic ABS issue for a country is how it will implement Prior Informed Consent, as required by Article 15(5) of the CBD. The CBD requires access applicants to seek the PIC of national governments (unless that government determines otherwise). The consent of the actual providers of genetic resources and associated knowledge (e.g. local and indigenous communities, protected area managers and directors of *ex situ* collections) is also required under national access laws, such as Bolivia's Regulation on Andean Pact Decision 391.

PIC guarantees the rights of providers. But it can also present a major challenge for access seekers. Where procedures are unclear or excessively complex, PIC can act as a disincentive to users, either to seek access in the first place, or to obtain material by official channels. If providers are not to lose out on valuable benefit-sharing opportunities, a balance needs to be found, allowing enforcement of PIC, and a clear, transparent and efficient procedure by which PIC can be obtained from all providers concerned.

PIC can be especially challenging to obtain at the local level, given difficulties in defining what constitutes the relevant local community, and in identifying the correct local representation. An International Co-operative Biodiversity Group in Peru (ICBG, Peru) struggled to balance competing claims of local representation. Agreement was eventually struck to dedicate short- and medium-term benefits from research activities and advance payments to communities actively involved in the project, and to share long-term benefits such as royalties with all communities of the tribal group concerned. What began as a negotiation between co-operating individuals turned into a protracted disclosure and consensus-building process, involving many community individuals, village leaders and others.

An ICBG in Chiapas, Mexico (ICBG Maya) faces similar problems. Eleven Mayan organisations, collectively known as the Council for Indigenous Traditional Midwives and Healers of Chiapas, are challenging the validity of PIC that the ICBG claims to have originally obtained. In India, a project to develop a lead compound derived from *Trichopus zeylanicus*, a plant used by the Kani tribal community, successfully obtained the support of Kanis in one area, but offended Kanis from another area that had not been involved in the project's development.

An ABS strategy process presents an opportunity to clarify local representation for the purposes of PIC. By identifying and agreeing upon representation in advance, local and indigenous communities, protected area managers and other local bodies with overlapping authority, could pre-empt conflicts and protracted negotiations over individual access applications. This might place them in a more competitive position to derive benefits from ABS partnerships.

Source: ten Kate, K. and S. A. Laird (1999) page 29; Rural Advancement Foundation International (RAFI) News Release – 1 December 1999 'Biopiracy Project in Chiapas Mexica Denounced by Mayan Indigenous Groups.

4.2 Regional and multilateral cooperation over ABS

The Andean Community's Common System on Access to Genetic Resources, a law on ABS common to Bolivia, Colombia, Ecuador, Peru and Venezuela, is one such example. The Preamble recognises that "Biological diversity, genetic resources, endemism and rarity, as well as the knowledge, innovations and practices of indigenous, Afro-American and local communities in relation to these, are of strategic value at international level". One of the 5 objectives of the Common System is to strengthen the negotiating capacity of the member countries. Also member

countries are required to share information on access applications to prevent them undercutting each other. Other regions discussing common approaches or shared model access regulations include ASEAN and the Organisation of African Unity. At the multilateral level, the ongoing negotiation of the revised International Undertaking on Plant Genetic Resources for Food and Agriculture aims to create a multilateral system for access to a list of crops for food and agriculture, on the basis of food security and interdependence (ten Kate, 1999; ENB, 2000; Fowler, 2001).

4.3 The importance of image abroad

Costa Rica's National Institute of Biodiversity (INBio) entered into one of the most widely publicised access and benefit-sharing agreements in 1991, when the pharmaceutical company Merck paid US$1.185m for access to Costa Rican biodiversity (ten Kate 1995). Since then, INBio has entered into agreements with companies in a range of sectors, including pharmaceuticals, phytomedicines, fragrances, crop protection products and biotechnology, which have contributed over US$390,000 to the Ministry of Environment and Energy, US$710,000 to conservation areas, US$710,000 to public universities, and US$740,000 to other groups at INBio, particularly the Inventory Programme (ten Kate, 1999). Not only does Costa Rica have many of the competitive advantages set out in Section 4.4 of the Manual, such as political stability and 'megadiversity' in 5% of the world's terrestrial ecosystems, but the experience that INBio has gained through its work on bioprospecting means that it is familiar with the needs of industry and is well known as a potential partner.

4.4 Incentive measures to boost domestic capacity in bioenterprise

There are a variety of possible incentive measures to boost domestic capacity in bioenterprise. These include:

- Venture capital funds for biodiversity-based businesses, e.g. Terra Capital (www.terra-capital.com), and the EcoEnterprises Fund created by The Nature Conservancy and the Multilateral Investment Fund of the IDB (Bayon, et. al, 2000).
- Credit for biodiversity-based businesses, e.g. GEF Small and Medium Enterprises Programme, export credit facilities and investment guarantees against commercial risk (Bayon, et. al, 2000).
- Capacity-building and training in enterprise development, including provision of training and tools for business planning, and infrastructure development for R&D 'centres of excellence, e.g. the Brazilian Programme of Molecular Ecology for the Sustainable Use of Biodiversity in Amazonia (PROBEM-Amazonia) (Bayon, et. al, 2000).

4.5 Measures to support R&D

An ABS strategy could potentially address a variety of measures to improve national competitiveness in R&D. Some countries have taken steps to promote partnerships between foreign and domestic research institutions and businesses. For example, Thailand's National Science and Technology Development Agency (NSTDA) provides a 'matching service' between researchers, inventors and manufacturers in Thailand and foreign companies (see: www.nstda.or.th). Within research institutions, industry liaison offices may help secure technology transfer on concessional terms, intellectual property protection for in-house innovation, and licensing opportunities for commercialisation (Wolson, 1999). Further steps could be taken to promote 'grassroots' innovation, using local knowledge and technology. For example, India's National Innovation Foundation facilitates partnerships between local innovators and domestic research institutions and entrepreneurs, and assists these innovators in obtaining intellectual property protection (see also: www.nifindia.org) (Khwaja, 2001).

APPENDIX

4.6 Guidelines and codes of conduct for access and benefit-sharing

This section provides an indicative list of voluntary guidelines and codes of conduct for ABS. These govern Prior Informed Consent, the conduct of researchers in the field, the acquisition, curation, use and supply of genetic resources and/or associated traditional knowledge (including the publication and distribution of data), as well as benefit-sharing.

Guidelines for both provider countries and users
Swiss Government, *Building a New Partnership: Draft Guidelines on Access and Benefit Sharing Regarding the Utilisation of Genetic Resources*, UNEP/CBD/EP-ABS/2/INF/1.
Guidelines for ex situ collections
FAO, *International Code of Conduct for Plant Germplasm Collecting and Transfer* - http://users.ox.ac.uk/~wgtrr/decin.htm
Common Policy Guidelines for Participating Institutions on Access to Genetic Resources and Benefit-Sharing - http://www.rbgkew.org.uk/conservation/agrbs-policy.html
Micro-organism Sustainable Use and Access regulation; International Code of Conduct (MOSAICC) - Project secretariat: Philippe Desmeth, desmeth@mbla.ucl.ac.be
Guidelines for research partnerships
Dr Anthony B. Cunningham, *Guidelines for Equitable Partnerships in New Natural Products Development*, http://users.ox.ac.uk/~wgtrr/decin.htm
Philippines Government*, Code of Conduct for Academic Collector of Biological and Genetic Resources in the Philippines*,
Pew Conservation Fellows, *Biodiversity Research Protocols: Guidelines for Researchers and Local Communities Interested in Accessing, Exploring and Studying Biodiversity* (1996) - http://users.ox.ac.uk/~wgtrr/decin.htm
The Inuit Tapirisat of Canada, *Negotiating research relationships in the North* - http://users.ox.ac.uk/~wgtrr/decin.htm
Project for the Study of the Management of Wildlife Areas of Kuna Yala, *Research Program: Scientific Monitoring and Co-operation* (1998), in Alexaides, M. N. (ed), (1996) Selected Guidelines for Ethnobotanical Research: a field manual, NYBG.
Professor Anil K. Gupta, *Suggested Ethical Guidelines for Accessing and Exploring Biodiversity*. http://users.ox.ac.uk/~wgtrr/decin.htm
Codes of conduct for professional societies
American Anthropological Association, *Code of Ethics* (June 1998), http://www.aaanet.org/committees/ethics/ethcode.htm
International Society of Ethnobiology (ISE), *Code of Ethics* (1998), and *Guidelines for Research, Collections, Databases and Publications* (Draft 3, 1998) - http://users.ox.ac.uk/~wgtrr/decin.htm
The American Society of Pharmacognosy (ASP), *Guidelines for Members* (1992)
Society for Economic Botany, *Guidelines for Professional Ethics of the Society for Economic Botany* (1995) - http://users.ox.ac.uk/~wgtrr/decin.htm
Seventh Asian Symposium on Medicinal Plants, Spices and Other Natural Products (ASOMPS VII), *The Manila Declaration concerning the Ethical Utilisation of Asian Biological Resources* (1992) - *Code of Ethics for Foreign Collectors of Biological Samples* (Appendix 1) and *Contract Guidelines* (Appendix 2) - http://users.ox.ac.uk/~wgtrr/decin.htm

Source: Laird and Posey (2001); Oxford Centre for the Environment, Ethics and Society (OCEES); RBG Kew research.

APPENDIX

4.7 Case studies and other source material on ABS partnerships (by sector)

Biotechnology
▪ *Biotechnology in fields other than Healthcare and Agriculture,* in ten Kate, K. and S. A. Laird (1999), The Commercial Use of Biodiversity. Access to Genetic Resources and Benefit-Sharing, Earthscan, London
▪ ten Kate, K., et. al., *Yellowstone National Park and the Diversa Corporation Inc.* CBD Website www.biodiv.org/ benefitsharing/gen-res.html
Crop breeding
▪ ten Kate, K. and A. Collis, *The Genetic Resources Recognition Fund of the University of California, Davis*. CBD Website
Crop protection
▪ *Crop Protection*, in ten Kate, K. and S. A. Laird (1999)
▪ *The Papua New Guinea Oil Palm Research Association Benefit-Sharing Partnerships with the Department of Zoology, Oxford University*, in SPREP/ FIELD/ WWF-S. Pacific (2000), Biodiversity Convention. An Information Package for Pacific Island Countries (Draft) www.pacificbiodiv.org
Natural personal care and cosmetics
▪ *The Natural Personal Care and Cosmetics Industry*, in ten Kate, K. and S. A. Laird (1999)
Horticulture
▪ *Horticulture*, in ten Kate, K. and S. A. Laird (1999)
Botanical medicines
▪ Peteru, C., *Kava Case Study*, in SPREP/ FIELD/ WFF-S. Pacific (2000)
▪ *The Botanical Medicine Industry*, in ten Kate, K. and S. A. Laird (1999)
▪ Anuradha, R. V., *Sharing with the Kanis: A Case Study from Kerala, India.* CBD Website
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