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Biological Diversity and Indigenous Knowledge

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Contents

Major Issues Summary

Introduction
- Biological diversity, bioprospecting and Indigenous knowledge
- The values of biological diversity
- Bioprospecting
- Biological diversity, cultural diversity and Indigenous peoples

Indigenous knowledge
- Indigenous peoples and the environment
- What is Indigenous knowledge?
- Expressions of Indigenous knowledge
- Challenges to recognising and protecting Indigenous knowledge

Protecting Indigenous knowledge and biological diversity-the international context
Over the millennia, Indigenous peoples have developed a close and unique connection with the lands and environments in which they live. They have established distinct systems of knowledge, innovation and practices relating to the uses and management of biological diversity on these lands and environments.

Much of this knowledge forms an important contribution to research and development, particularly in areas such as pharmaceuticals, and agricultural and cosmetic products. In the context of these uses, Indigenous peoples claim that their rights as traditional holders and custodians of this knowledge are not adequately recognised or protected. They demand not only recognition and protection of this knowledge, but also the right to share equitably in benefits derived from the uses of this knowledge.

Existing intellectual property laws offer limited scope for the recognition of Indigenous peoples' rights in biodiversity related knowledge and practices. Similarly, native title, heritage and environmental laws and policies also provide insufficient means for addressing Indigenous rights in biodiversity-related knowledge and practices.

The challenge is to protect the rights of Indigenous peoples to their knowledge, while
also conserving biological diversity. The Convention on Biological Diversity is one international instrument that has the potential to achieve both these objectives. Its primary objective is the conservation and management of biological diversity. It also provides opportunities for the protection of Indigenous knowledge practices and innovations related to biodiversity and for the introduction of measures for equitable sharing of benefits with traditional knowledge holders.

Following Australia's ratification in 1993 of this Convention, the introduction of initiatives need to be considered that specifically recognise and protect the rights of Indigenous peoples to their biodiversity related knowledge, innovations and practices.

The introduction of measures that ensure Indigenous peoples share equitably in benefits derived from the uses of their knowledge will not only protect knowledge, but can also act as incentives to environmental conservation.

This paper surveys a range of international developments as a context for discussing some possible measures for the protection of Indigenous knowledge. Successful measures could include a combination of creative legislative and policy responses to the Convention on Biological Diversity, and the use of a range of other laws, policies and instruments. The integration of Indigenous knowledge and practices with other conventional approaches to land and environment is also a useful way of achieving recognition and protection for Indigenous knowledge systems.

Contracts, agreements and protocols are particularly useful for protecting Indigenous knowledge systems, as these offer the flexibility to include specific negotiated arrangements for equitable benefit sharing, and can be designed to meet the needs of all parties. Ultimately, the most effective approach is to establish a dialogue with key interest groups, such as industry, intellectual property organisations, Indigenous communities and organisations, governments, and conservation groups. Discussions could then proceed towards developing an integrated conservation and benefit-sharing system based on a partnership between the key organisations and sectors.

Introduction

Biological diversity, bioprospecting and Indigenous knowledge


Biological diversity or biodiversity refers to the 'variety of all life forms-the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part'. There are three levels of biodiversity-genetic, species, and ecosystem diversity, all of which form the total diversity of Australia's environments.(1) Australia is considered particularly rich in the extent of its diversity of flora and fauna. Some estimates are that of the 44,000 species of plants in Australia, about 90 per cent occur only in Australia.(2) Australia's biological diversity is under increasing threat of loss due to
industrialisation and urbanisation, land clearances, farming and agricultural activities. A recent World Conservation Union report has found Australia to have the second highest number of plant species threatened by extinction of any country in the world.(3)

The values of biological diversity

Biological diversity is increasingly becoming recognised as important beyond its purely scientific interest. Social and economic values of biodiversity are assuming greater significance as a range of different groups, including Indigenous peoples assert their claims and interests.

A diverse environment provides an important storehouse for the raw materials used in a range of products and processes, such as in agriculture, medicine, and cosmetics. Many species are also important in a growing 'bush food' industry. The pharmaceutical industry is arguably the largest commercial user of plant genetic species, and the development of these products can create significant opportunities for economic growth for this industry sector.

The diverse range of interests in biodiversity raises questions about how to reconcile what may sometimes be competing interests and values in the natural environment. For example, the conservation of biological diversity may be at odds with the potential economic values and uses of biological diversity. This then raises questions as to how we assign values to nature: can nature be measured in scientific or monetary terms? Who 'owns' nature? Is the natural environment to be preserved as the collective heritage of the nation, or is it to be subject to the various demands, claims and interests of particular individuals, communities or groups. Who ultimately stands to benefit most from the harvesting of natural resources-governments, communities, or others? Can there be a sound balance between the conservation and protection of biodiversity for its own sake, and the sustainable uses of it?

Among the diverse interests in the natural environment are those of Indigenous peoples. There are many aspects to Indigenous peoples' claims and interests in the natural environment and biological diversity. Indigenous peoples seek recognition and protection of their distinct rights in knowledge of, and practices relating to the management, use and conservation of biological diversity. They also seek the introduction of measures to prevent exploitation of their knowledge, and compensation or financial benefits from the uses of their knowledge, innovations and practices. At the same time, some customary Indigenous practices such as hunting, fishing and gathering—often little understood by non-Indigenous people—provide potential conflict with conventional conservation and environmental management laws, programs and activities.

It is important to recognise that there is the same diversity of views among Indigenous peoples as there is in the wider community. Some Indigenous people may wish to preserve biodiversity related knowledge as their collective heritage, while others may see potential economic benefits to be gained by allowing the use by the wider community of their biodiversity related knowledge and practices. Some of these issues
become apparent when considering the use of biological diversity for pharmaceutical and other products—an activity known as bioprospecting.

Bioprospecting

Bioprospecting is the name given to the search for useful plant related substances that can be developed into marketable commodities such as pharmaceuticals, pesticides and cosmetics. Increasingly sophisticated biotechnological processes are used to transform plant derived substances into commercially successful products with global markets. The patenting of products and substances derived from the natural environment has particular implications for Indigenous peoples' claims.

A patent is an important component of industrial property law that confers exclusive rights on the creator of an invention. The conditions required for a patent are that the invention—either a product or a process—should be new, non-obvious (i.e. it should involve an inventive step), and industrially applicable. Another requirement for a patent is that the invention should be clearly described and documented and made available to wider society (e.g. through publications in books or journals).(4) The following examples of bioprospecting and the patenting of biological products raise important issues regarding the role of Indigenous knowledge, practices and innovations, and the applicability of patent laws to these.

The neem tree (Azadirachta indica) is found widely throughout parts of India. It forms a central part of Indian communities' culture and heritage. It is used by these communities for a vast range of purposes such as in medicines, toiletries, insecticides, fertilisers, and in agriculture.(5) The medicinal, pharmacological and therapeutic properties of neem have been known about and used for millennia, and it is known in Sanskrit as Sarva Roga Nivarini, 'the curer of all ailments'.

From the early 1970s, the neem tree began to attract the attention of United States and global markets. In 1971 a US timber importer noted the properties of the neem tree, and began importing it. Following testing for a pesticidal product derived from neem extracts, the importer received clearance for this product from the US Environmental Protection Agency in 1985, and in 1988 he sold the patent for the pesticide to the transnational chemical company W. R. Grace & Co.(6)

The patenting and marketing by Grace of products based on neem derived substances led to a debate about the appropriation of the intellectual property of Indian communities. Indian and Third world critics of Grace's approach claim that the preparation of neem based products has been part of the collective community knowledge of Indian societies for millennia, and should not have been patented by Grace. They refuted the assertions by Grace that its methods for developing neem based products were novel, non-obvious and based on extraction methods that constituted an innovative technique, and therefore amenable to patenting. Instead, the critics argued that the extraction and preparation of active substances from neem is a traditional innovation based on millennia of collective knowledge and practice. The critics state that:

Patent claims on the various processes and products of the neem that are
built on the vast cultural and intellectual heritage of the Indian people, reflect a total devaluation of the country's intellectual heritage and an arrogance based on the assumption of superiority of western sciences.(7)

The bioprospecting and patenting of the neem tree has parallels in Australia, as illustrated by the case of the smokebush.

The smokebush is the common name for *Conospermum*, a plant that is widespread throughout parts of western Australia and in parts of some other states. It was used traditionally by Aboriginal peoples for a variety of therapeutic purposes.(8) During the 1960s, the smokebush was among those plants that were collected and screened for scientific purposes by the US National Cancer Institute, under license from the West Australian Government. In 1981, some specimens were sent to the US where they were tested for possible anti-cancer chemicals. No cancer resistant properties were found, and the samples were stored for several years. Later, in the late 1980s, these samples were again tested, but this time for potential substances that could cure AIDS. A substance called *Conocurvone* was isolated which, when laboratory tested, was found to destroy the HIV virus in low concentrations.

To develop this substance, in the early 1990s the WA Government granted a license to Amrad Pty Ltd, a Victorian based multinational pharmaceutical company. The US National Cancer Institute granted Amrad an exclusive worldwide license to develop the patent for this anti-AIDS substance. It has been suggested that Amrad provided $1.5 million to gain access rights to smokebush and related species. Some estimates state that the WA Government would receive royalties exceeding $100 million by the year 2002 if Conocurvone is successfully commercialised. Given these commercial values on smokebush and its derivatives, critics argue that there should be provisions for Aboriginal peoples to share equitably in benefits from this plant, given their role as first having identified and used the smokebush for its therapeutic and healing properties.(9)

The collecting and screening of smokebush by scientific interests has been facilitated by the Western Australian Government's use of its *Conservation and Land Management Act 1984*. This Act was amended in 1993 to include a clause specifically designed to encourage state control over biological resources. Some have argued that these amendments disadvantage Indigenous peoples who claim rights to species, or knowledge of species in Western Australia, favouring instead, state and industry interests in these.(10)

These examples of bioprospecting and patenting of biological and genetic products raise issues about what is patentable subject matter. Patent law generally defines subject matter that is deemed patentable in terms of what subject matter is excluded from patent applications. These exclusions usually comprise discoveries of materials or substances that already exist in nature, plants or animals or products from these, or biological processes (other than microbiological processes) for the production of plant or animal varieties or products.(11)

**Biological diversity, cultural diversity and Indigenous peoples**
The loss of rich biologically diverse environments (such as the Amazonian forests) through activities such as logging, land clearance and mining and development has profound consequences in its impact on the culturally diverse groups of Indigenous peoples whose livelihoods depend on these environments. There is in this sense, a direct relationship between biological diversity and cultural diversity; maintenance of the former can help preserve the latter. The reverse is also true, since Indigenous peoples are often the custodians and stewards of biological diversity, the maintenance of cultural diversity is an important factor in the conservation of biological diversity.

Despite these important links between cultural, and biological diversity, the recognition of cultural diversity does not necessarily always exist in harmony with the preservation of biological diversity. The preservation of cultural diversity is taken to include having a respect for, and maintaining Indigenous peoples' rights to hunt, fish and gather according to their customary laws and practices. These practices, as shown below, sometimes conflict with the interests of conservation and environmental protection.(12)

Ultimately, solutions need to be found that can provide a balance between the recognition and protection of Indigenous cultural rights, and the interests of conservation. Joint managed protected areas, regional and local agreements, and similar types of arrangements (discussed below) may provide some opportunities for this balance, based on a 'new Australian land ethic'.(13)

### Indigenous knowledge

#### Indigenous peoples and the environment

Indigenous peoples have long had a significant interdependence with the lands and environments in which they live. These lands and environments are vital for their survival, providing a wide array of substances for food, shelter and implements. They also provide a source for a variety of objects for both ritual and everyday use. The land and environment is also significant in Indigenous peoples' cultural, religious and social systems. Indigenous peoples are custodians and stewards of their lands and environments, and have been entrusted by ancestral charters to care for these through successive generations.

The land, its features, environments and products form cultural landscapes, which are given significance by Indigenous belief systems. These cultural landscapes are both the result of, and provide the focus for, ancestral events. Together with Indigenous peoples' social, political and religious systems, lands and environments are interwoven into a tightly integrated cultural system that derive their meaning from the Dreaming. This integrated cultural system forms the basis for Indigenous knowledge.

### What is Indigenous knowledge?

Indigenous people have a vast knowledge of, and capacity for developing innovative practices and products from their environments. The following distinctive features
characterise indigenous knowledge:

- collective rights and interests held by Indigenous peoples in their knowledge
- close interdependence between knowledge, land, and other aspects of culture in Indigenous societies
- oral transmission of knowledge in accordance with well understood cultural principles, and
- rules regarding secrecy and sacredness that govern the management of knowledge.

Knowledge is a fundamental component of Indigenous culture, and must be considered in terms of both its sacred and secular dimensions. To Indigenous peoples, knowledge is not considered independently from its products and expressions, or from actions. These all form part of a closely integrated cultural system. The physical products and expressions of Indigenous cultures are intimately connected to the knowledge from which they derive, or with which they are associated.

Products and expressions of Indigenous knowledge systems include ceremonial and ritual objects and performances, artistic designs, works and expressions, and song, dance and story, and subsistence and land and environment management activities (such as hunting, fishing and gathering, and the use of fire).

Systems of knowledge, and their products and expressions are vital to ensuring the continuity of Indigenous cultures, and are important vehicles for enabling Indigenous peoples to adapt their societies and cultures to introduced societies, cultures and technologies. By maintaining cultural diversity, recognition and protection of Indigenous knowledge can also benefit environmental conservation and sustainable management.

**Expressions of Indigenous knowledge**

Indigenous ecological knowledge is expressed in many ways. Some particularly important expressions are customary practices such as hunting, fishing and gathering. Since these activities require knowledge of customary ways of procuring these resources, the exercise by Indigenous peoples of their rights to carry out these activities in accordance with their laws and customs may be regarded as a demonstration of their assertion of their rights to their traditional knowledge systems. Indigenous customary hunting, fishing and gathering practices may therefore be considered aspects of rights relating to land:

While caution needs to be exercised to avoid classifying the incidents of Aboriginal title in terms of English property law concepts, it seems clear that fishing, hunting and gathering rights can comprise part of Aboriginal title to land. However...while customary Aboriginal fishing, hunting and gathering rights may be part of the bundle of rights comprised in Aboriginal title to land, there is no necessary nexus between them.

Another writer argues 'not only is the recognition of Aboriginal fishing and hunting rights compatible with common law concepts of interests in land, but may in fact act
as a catalyst for preserving those resources for their common enjoyment and use'. (16) This point is supported by Section 223(2) of the *Native Title Act 1993 (Cwlth)* which defines native title 'rights and interests' to include 'hunting, gathering, or fishing, rights and interests'. These statements support an argument that it is not only possible, but necessary to devise a system that can meet the objectives of both conserving biodiversity, and also protecting Indigenous customary uses of biodiversity.

Conservation and resources legislation varies in all jurisdictions in terms of whether provisions allow for Indigenous customary or traditional practices. In many cases, legislation includes some exemptions for Aboriginal people from regulations governing hunting, fishing and gathering. These exemptions provide limited recognition of Indigenous peoples' 'traditional' activities concerning land use. (17) Despite these beneficial provisions, there have been some cases in which conflict has arisen between the requirements of conservation legislation and Indigenous peoples' actions.

In 1987 an Aboriginal elder from the Gungalida people in Queensland was found to have contravened the *Fauna Conservation Act 1974 (Qld)* by taking bush turkey. The plaintiff had argued that his actions were carried out in accordance with his customary entitlement to take the animal. The High Court's decision was based on whether the action by the Aboriginal man had contravened *The Criminal Code (Qld)* through an 'offence relating to property'. (18) This case shows how the imposition of state conservation laws can sometimes provide impediments to Indigenous peoples' ability to exercise their customary rights regarding exploitation of particular species-rights that are based on the accumulation of ecological knowledge and customary practices.

The competing priorities and interests between Indigenous customary hunting, fishing and gathering activities, and conservation were among the issues considered in the Australian Law Reform Commission's 1986 report on *The Recognition of Aboriginal Customary Laws*. That report recommended some guidelines to be incorporated into legislation in all jurisdictions. These guidelines suggested:

- that priority is given to conservation over traditional hunting and fishing activities
- that access is provided to Indigenous people to their traditional lands for the purpose of hunting, gathering and fishing
- that sea closures are provided to allow for traditional fishing activities to be conducted in waters adjacent to Aboriginal land, and
- that measures are developed for improved consultation with Indigenous peoples, and for them to have greater control over land and marine management. (19)

**Challenges to recognising and protecting Indigenous knowledge**

Indigenous peoples have for a long time advocated their wish to be recognised as having unique rights, based on their distinct Indigenous status. While the focus in the quest for Indigenous rights has been on land rights, Indigenous peoples assert that they also have rights in the biological resources on the lands, and in the knowledge they
possess of these resources.

Indigenous peoples are increasingly concerned that their knowledge of the natural environment is being exploited. They assert that the collection, screening, and patenting of plants and plant products by pharmaceutical, cosmetic and other research companies is being carried out without due regard for the rights of the Indigenous holders and custodians of knowledge about biological resources. This bioprospecting is, according to Indigenous claims, mostly being carried out without the prior informed consent of the custodians of knowledge, and with little or no provision for financial returns to Indigenous communities. Although Indigenous peoples claim that their knowledge constitutes part of their 'intellectual property rights', the protection of biological, or other forms of Indigenous knowledge does not fall within the scope of existing intellectual property laws.

Indigenous knowledge of medicinal and other plants and practices is a significant contributor to scientific research and development in pharmaceuticals, cosmetics, foodstuffs, agricultural products, and a wide range of other biologically based products and processes. The challenge is therefore to develop a system which satisfies the needs of industry, achieves conservation goals, and also recognises and protects the rights of Indigenous peoples.

An effective system would incorporate provision for financial and other benefits that flow from the uses of Indigenous knowledge and practices to be shared equitably with the Indigenous knowledge holders and innovators. An equitable benefit sharing arrangement would recognise and protect Indigenous peoples' rights, encourage economic self-sufficiency for Indigenous peoples, and also provide incentives for the conservation and sustainable uses of biological diversity. The development of this kind of system poses a challenge in terms of how it might recognise the distinct property rights held by Indigenous peoples in their knowledge.

The collective nature of Indigenous rights makes it difficult to establish the extent of, and the precise social and political dimensions of rights and interests. Establishing the legitimacy of claims to knowledge and biological resources will require clarification of clan, family and other group rights and interests in such items.

The antiquity of customary systems of knowledge and practices, and their oral transmission through generations also present challenges to legislators and administrators in designing regimes for the recognition and protection of these knowledge systems.

Rules governing secrecy also pose challenges to those faced with the task of deciding Indigenous peoples' claims in knowledge. The complex nature of land tenure systems, and the dispersal and dispossession of Indigenous peoples resulting from the history of colonisation and dispossession impose constraints on identifying Indigenous biodiversity related knowledge systems.

Land clearances and erosion arising from farming, agriculture and urban development have led to an enormous loss of Indigenous customary knowledge and practices relevant to biodiversity. These, combined with a loss on biodiversity, and changes in
growing patterns and habitats of flora and fauna, means it is difficult for Indigenous people to demonstrate their exclusive rights to biological species, and knowledge of these.

With the history of colonisation and dispossession, Indigenous peoples have adapted to modern technologies, lifestyles and cultural systems. This makes it difficult to identify knowledge that is derived from distinctly Indigenous traditional systems and which maintained according to traditional or customary practices, as distinct from knowledge that is everyday, 'common' knowledge.

Finally, the dispersed nature of decision making and authority structures in Indigenous societies will present difficulties when considering the introduction of measures for distributing benefits obtained from the uses of Indigenous knowledge back to those communities in which the knowledge holders belong. It would be difficult to identify a unit or group that has the traditional authority to make decisions about uses of knowledge and practices, and responsibility for distributing any financial or other benefits that flow from the uses of these.

In order to explore some possible solutions to protecting Indigenous knowledge in biodiversity, it is useful to review the context of international and Australian developments within which solutions might be proposed.

**Protecting Indigenous knowledge and biological diversity-the international context**

International developments provide a potential framework for discussions about the recognition and protection of Indigenous knowledge.(21)

**Intellectual property rights**

The effective implementation of the *Convention on Biological Diversity* requires the development of a clear framework for clarifying rights and responsibilities in biodiversity. It is argued that one factor in the loss of biodiversity is the 'lack of clear property rights governing ownership and access to biodiversity'. To address this, 'in many cases better specification of property rights can encourage the holders of such rights to be responsible and accountable for the sustainable management of the resources in their control'.(22) Property rights that determine the management of biodiversity 'need to be well specified, context-specific and enforceable'.(23)

Consideration of property rights in biological resources is of importance to Indigenous peoples, who claim that their cultures and livelihoods depend on these resources, and that their knowledge and practices relating to the natural environment constitute part of their intellectual property. The problem with this is that existing intellectual property rights (IPR) systems do not provide for recognition of Indigenous peoples' collective rights in knowledge relating to biodiversity. IPR systems protect only
material forms, and not the intangible ideas or knowledge associated with these.(24) While the Copyright Act 1968 has been the subject of much of the discussion concerning Indigenous peoples' intellectual property rights, the Patents Act 1990 is more relevant to Indigenous rights in biodiversity related knowledge.

To obtain patent rights, a product should be novel and not merely a 'discovery' of something that occurs naturally. It must also be 'non-obvious', resulting from the transformation of a natural substance using some technological process. Finally, as with other intellectual property laws, patents are used to confer property rights on individuals or corporations and do not provide for the kinds of group, or collective rights that Indigenous peoples hold in knowledge and practices. There is also a fixed period for protection under patent laws, usually up to 20 years, which again does not provide for Indigenous knowledge that is often the result of millennia of innovation and transmission.

It is possible for 'joint inventors' to take out a patent. In this sense, it is possible in principle for Indigenous people, whose contributions based on their traditional knowledge and practices are significant components of patentable inventions and processes, to be included as 'joint inventors'. However, in practice, the particular types of knowledge and innovations of Indigenous peoples are not recognised for the purposes of the Patent Act.(25)

Other international developments

International standard setting developments and other processes provide a useful context within which measures for recognising and protecting Indigenous knowledge can be considered.

The Draft Declaration on the Rights of Indigenous Peoples being developed by a working group of the United Nations Commission on Human Rights provides, at Article 24, for Indigenous peoples' rights to 'their traditional medicines and health practices, including the right to the protection of vital medicinal plants, animals and minerals'. Article 29 provides that Indigenous peoples are 'entitled to the recognition of the full ownership, control and protection of their cultural and intellectual property'. These peoples, this Article says:

...have the right to special measures to control, develop and protect their sciences, technologies and cultural manifestations, including human and other genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs and visual and performing arts.

International Labour Organisation Convention 169 ('ILO 169') also contains various provisions (e.g. Articles 4, 5, 8, 13 and 23) relevant to the protection of Indigenous peoples' cultures, environments, and religious and political systems.

One international development that provides specific opportunities for introducing measures to protect Indigenous knowledge is the Convention on Biological Diversity, mentioned above. Article 8(j) of this Convention encourages countries, 'subject to
national legislation' to:

...respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.

The Conference of Parties to the Convention on Biological Diversity includes on its agenda for its annual meetings, consideration of Article 8(j) and related provisions. This work includes attempts to clarify, and define the nature and scope of Indigenous knowledge, innovations and practices, and the collection and synthesis of case studies.(26) In recognition of the importance of Article 8(j) and Indigenous peoples' interests, in addition to discussions of this subject at annual meetings of the Conference of Parties, a workshop on 'traditional knowledge' was held in Madrid in November 1997. At the fourth session of the Conference of Parties that was held in Bratislava, Republic of Slovakia in May 1998, a decision was made that there be an ad hoc, open ended intersessional working group to further consider Article 8(j) and related provisions.

While the Convention on Biological Diversity provides a potentially useful opportunity for countries to introduce new measures to recognise and protect Indigenous knowledge and innovations, it also imposes some constraints. The requirement that implementation of Article 8(j) should be subject to national legislation may be problematic for Indigenous peoples, especially if existing national laws take precedence, and where these might contravene, or place limitations on any measures that may be introduced under 8(j). Conversely, the Convention may encourage countries to introduce special national laws beneficial for the protection and conservation of Indigenous knowledge, traditions, innovations and practices.(27)

The use of the term 'traditional lifestyles' in the wording of Article 8(j) may also be interpreted to imply the exclusion of many Indigenous communities who have not retained their direct connections with lands and resources, but who wish to protect and preserve their knowledge and innovations.(28)

Another UN development important to the recognition and protection of Indigenous knowledge is the study of Indigenous peoples' culture and heritage by Special Rapporteur Erica-Irene Daes. This study is useful in its emphasis on the close interdependence in Indigenous societies between land, environment, and heritage. Daes suggests that to Indigenous peoples, 'cultural property', 'intellectual property', and biological resources are all components of their 'collective heritage'. She states:

...Indigenous peoples do not view their heritage in terms of property at all—that is, something which has an owner and is used for the purpose of extracting economic benefits—but in terms of community and individual responsibility. Possessing a song, story or medicinal knowledge carries with it certain responsibilities to show respect to and maintain a
reciprocal relationship with the human beings, animals, plants and places with which the song, story or medicine is connected. For indigenous peoples, heritage is a bundle of relationships, rather than a bundle of economic rights.(29)

Although this report implies that Indigenous peoples are uniformly opposed to the commodification of heritage, in practice some Indigenous peoples may regard elements of their heritage as common property, and seek opportunities to reap benefits from its uses by the wider community. Any benefit sharing arrangements that may be introduced will need to provide for the diversity of views and approaches among Indigenous peoples regarding the economic values of their heritage.

Other developments in environment and conservation

A range of other developments in international standard setting relating to environment and conservation have particular relevance to the consideration of measures for protecting Indigenous biodiversity related knowledge. These instruments and statements are especially useful in that they build up a body of principles relevant to the recognition and protection of Indigenous peoples' knowledge systems, and may ultimately influence law and policy development. The most important of these international developments have resulted from the 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil. In addition to the Convention on Biological Diversity, other outcomes from UNCED are the Rio Declaration, Agenda 21, and the Statement of Forest Principles.

Agenda 21 provides a charter and program for action for sustainable conservation and development into the next century. Chapter 26 of Agenda 21 on Recognising and Strengthening the role of Indigenous Peoples and their Communities contains some important provisions directly relevant to Indigenous knowledge and management of biodiversity. For example Section 26.3(iii) states that Governments should, 'in full partnership with Indigenous people and their communities', recognise Indigenous peoples' 'values, traditional knowledge and resource management practices with a view to promoting environmentally sound and sustainable development'. Section 26.6(a) contains a program statement to implement this principle.

The Rio Declaration states at Principle 22 that:

Indigenous people and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognise and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Another outcome from UNCED was the establishment of the Commission on Sustainable Development (CSD) within the United Nations Environment Programme. An ad hoc Inter-governmental Panel on Forests within the CSD considered a range of matters concerning sustainable forest management, including the role of 'traditional forest related knowledge', a significant area of work relevant to Indigenous peoples' rights to ecological knowledge.
In 1994, the United Nations released a final report on Human Rights and the Environment, which had been prepared by a Special Rapporteur commissioned by the United Nations Sub-Commission on Prevention of Discrimination and Protection of Minorities. As an appendix to this report, a draft Declaration on the Right to the Environment includes provisions relevant to the protection of Indigenous knowledge. Paragraphs 6 and 13 provide generally for biodiversity conservation, and for equitable benefit sharing from environmental conservation. Paragraph 14 provides for Indigenous peoples’ rights:

Indigenous peoples have the right to control their lands, territories and natural resources and to maintain their traditional way of life. This includes the right to security in the enjoyment of their means of subsistence...Indigenous peoples have the right to protection against any action or course of conduct that may result in the destruction or degradation of their territories, including land, air, water, sea-ice, wildlife or other resources.(30)

These developments provide an important body of statements and principles that can influence international laws and policies to recognise and protect the customary knowledge and practices of local and Indigenous peoples.(31)

Indigenous peoples' statements and declarations

The Draft Declaration on the Rights of Indigenous Peoples referred to above was developed mostly by Indigenous peoples and their representatives during many years of meetings of the UN Working Group on Indigenous Peoples.

Over recent years there has been a series of statements and declarations developed by, or on behalf of Indigenous peoples which provide specifically for their rights in cultural and intellectual property, and knowledge, innovations and practices. These developments generally provide an important emerging 'soft law' of principles for Indigenous rights which ultimately must serve to guide, and hopefully influence, law and policy.(32)

Approaches to protecting Indigenous knowledge

Earlier in this paper mention was made that conventional intellectual property rights systems provide an inadequate means of protecting Indigenous knowledge. Alternatives to intellectual property rights systems provide greater opportunities for recognition and protection of Indigenous rights relating to biological and ecological knowledge, innovations and practices. Some of these alternative approaches are surveyed here.(33)

Benefit sharing approaches, contracts and agreements

The search for, collection and use of products and derivatives from biological diversity takes its toll on the environment. Bioprospecting also presents challenges for the inclusion of provisions that recognise and protect the intellectual property rights of the traditional users and holders of biological knowledge and practices.
Where bioprospecting is carried out, by using the proceeds from these activities to develop mechanisms for equitable sharing of benefits by Indigenous knowledge holders, it may be possible to achieve the twin goals of conservation, and the protection of the rights of knowledge holders and innovators. This type of approach would be consistent with the implementation of Article 8(j) and related provisions of the Convention on Biological Diversity. There are many examples of arrangements that have been introduced with the aim of benefit sharing for use of biodiversity. These types of systems are considered to be more effective than conventional intellectual property rights systems, as they offer greater flexibility and are not constrained by the limitations of IPR systems discussed above.

Benefit sharing arrangements that have been developed include various forms of contracts, agreements, and other mechanisms aimed at developing partnerships between different interest groups, and providing compensation and benefits to knowledge holders. The advantages of contractual arrangements include their capacity to 'be designed to fit any conceivable relationship between collaborators', to 'define the types and amounts of benefits', and to be able to 'target recipient populations and conservation objectives'. The benefits offered by contractual arrangements also include the provision of royalties and advance payments.

One example of an approach based on contractual arrangements is what is known as a system of International Co-operative Biodiversity Groups (ICBGs). These have been developed from an 'integrated conservation and development program' wherein 'appropriately designed natural products research and development can bring both short and long term benefits to the countries and communities that are the stewards of the genetic resources'. The proponents of this system state that 'sharing benefits from both the research process and from any drug discoveries that are made down the road creates incentives for conservation and provides alternatives to destructive use'. The ICBG program includes, among other advantages, 'equitable intellectual property and benefit sharing arrangements'. These systems are being developed in Peru, and in Nigeria.

Another example of a contract is an agreement that was developed between the giant pharmaceutical company Merck & Co. Inc., and the National Biodiversity Institute known as INBio, a non-profit research organisation established by the Government of Costa Rica. In this agreement Merck provides up-front funding (an initial $US1 million) to INBio for screening plants for possible AIDS cures. INBio will receive a share of any royalties that may result from successful product development. A proportion of the up-front payment (10 per cent), and 50 per cent of any royalties will be fed directly into conservation activities. This arrangement, which is primarily a contract for the screening of biodiversity, is celebrated by its supporters for its flexibility and the opportunities it provides for developing negotiated 'guidelines for collecting which can be adapted to meet the interests of both parties in a way which is unique to each particular situation'.

The advocacy organisation Rural Advancement Foundation International (RAFI) has criticised the Merck/INBio type of bilateral bioprospecting contract, arguing that they
'are not likely to provide adequate compensation to either indigenous peoples or developing countries unless they are made within the framework of broader intergovernmental arrangements'.(41) While the Merck/INBio agreement in Costa Rica is often described as a model partnership arrangement between a pharmaceutical company and a government, it may not be especially useful for considering the issue of Indigenous rights, since, as the authors of one report point out, 'Costa Rica has almost no indigenous people'. These writers go on to say:

The agreement between Merck and INBio includes training individuals from the working class as parataxonomists, but they approach the forest as employees with institutional educations, not as traditional peoples with indigenous knowledge. As a result, there are no issues of patent rights or land ownership to consider.(42)

Another example of a contractual arrangement is one that has been developed by Shaman Pharmaceuticals Inc., which derives its research from collaboration with Indigenous peoples and the uses of their traditional knowledge. This company established a non-profit independent organisation called the Healing Forest Conservancy, which will receive a proportion of the profits, obtained from Shaman's products. Healing Forest Conservancy 'supports biodiversity conservation and protection of cultural diversity and will independently determine how resources can best assist indigenous communities and organisations'.(43)

Other types of agreements include 'know-how' licenses, material transfer agreements, trust fund mechanisms, conservation compensation initiatives, and an 'intellectual integrity framework'. These types of arrangements all provide alternatives to intellectual property rights systems, and offer, to varying degrees of effectiveness, opportunities to develop mechanisms for equitable sharing of benefits from bioprospecting with Indigenous knowledge holders and innovators.(44)

**Rights based approach**

One approach that offers scope for recognition of Indigenous knowledge is a system called protection of 'traditional resource rights' by its proponents. This approach is based on the systematic use by Indigenous peoples of all the existing instruments, laws and policies relating to human rights, land, heritage, culture, environment and intellectual property. Combined with the introduction of reforms to these, as well as the development and implementation of measures such as contracts, agreements and protocols, this approach provides Indigenous peoples with a rights based framework in which to pursue their wish for recognition and protection of intellectual property rights in knowledge and biodiversity.

The principal developer of this approach, British ethnobotanist Darrell Posey, has written extensively on the ways in which relevant provisions in the Rio Declaration, the Convention on Biological Diversity, and a wide range of human rights and other instruments, in addition to emerging Indigenous and other standards and statements can be used by Indigenous peoples to achieve better recognition and protection for their intellectual property rights.(45)
Protecting Indigenous knowledge and biodiversity—Australian developments

Implementing the Convention on Biological Diversity

In 1996 the Commonwealth, state and territory governments endorsed a National Strategy for the Conservation of Australia's Biological Diversity. Action 1.8.2 of this Strategy is to:

Ensure that the use of traditional biological knowledge in the scientific, commercial and public domains proceeds only with the cooperation and control of the traditional owners of that knowledge and ensure that the use and collection of such knowledge results in social and economic benefits to the traditional owners. This will include:

a. encouraging and supporting the development and use of collaborative agreements safeguarding the use of traditional knowledge of biological diversity, taking into account existing intellectual property rights; and

b. establishing a royalty payments system from commercial development of products resulting, at least in part, from the use of traditional knowledge.

Other environment related developments


The 1993 Coastal Zone Inquiry conducted by the former Resource Assessment Commission included in its considerations Aboriginal and Torres Strait Islander issues. The resulting report recommended the enactment of Commonwealth legislation which, among other things:

- recognises Indigenous peoples' right to hunt, fish, gather and engage in other cultural practices according to tradition or custom
- provides mechanisms whereby the exercise of traditional rights to access and use of resources can be negotiated with other interests or interested parties (conservation, pastoral, etc), and
- provides mechanisms to ensure substantive Indigenous peoples' involvement in, and wherever possible control of, the management of their traditional environments and resources.

Most of these were initiatives developed and introduced by previous governments. It remains to be seen whether they are to remain on the agenda of the present
Government.

A Commonwealth State Working Group on Access to Australia's Biological Resources is developing a proposal for a framework regulating access to Australia's biological resources. A discussion paper released in October 1996 proposes a nationally consistent approach to managing access, and advocates a preferred 'multi-purpose contract system'. This system is based on the development of contracts between those wishing to collect biological resources, and the relevant owners of these resources. According to the report, these types of contracts would have the flexibility to be designed to suit specific circumstances and conditions, as well as the requirements of laws and policies in the particular jurisdictions in which they apply. Among the purported benefits of this system is that it would 'ensure an equitable return to the jurisdiction of any financial benefits arising from exploitation of the resource, and to share benefits and other information about the resource which may assist its further conservation and management'.(47)

This report does not deal adequately with questions of ownership and control, preferring instead to limit its consideration to matters of access only.(48) It also gives inadequate consideration of the rights and interests of Aboriginal and Torres Strait Islander peoples in biological resources. Systems that provide return of benefits to jurisdictions will not necessarily include provisions for benefit sharing by Indigenous peoples within those jurisdictions.

Another discussion paper released recently entitled Reform of Commonwealth Environment Legislation discusses proposals to 'comprehensively reform the Commonwealth's environmental law regime', with the objective to 'deliver better environmental outcomes in a manner that promotes certainty for all stakeholders and minimises the potential for delay and intergovernmental duplication'.(49) Among the measures proposed is a Biodiversity Conservation Act, which will replace a number of separate conservation acts, and 'result in an improved, integrated framework for the conservation and sustainable use of Australia's biodiversity'.(50) There have been some concerns expressed that the proposed new Biodiversity Conservation Act will not incorporate any 'last resort' provisions for environmental protection by the Commonwealth, as are presently available under the existing World Heritage Properties Conservation Act 1983, which is among those Acts the proposed Biodiversity Conservation Act would replace.(51)

A further problem with the proposals, as detailed in the discussion paper, is the absence of any references to those components of either the Convention on Biological Diversity, or the National Strategy for the Conservation of Australia's Biological Diversity that deal with the preservation of Indigenous knowledge and practices. The only reference that has implications for Indigenous knowledge relates to controls over access to biological resources.

The discussion paper states that the proposed Biodiversity Conservation Act will empower the Commonwealth Government to control access to biological resources by 'allowing regulations to be made in relation to the management of access to biological resources on Commonwealth lands and in marine environments under Commonwealth
control’. (52) The concern with this is that there is not an adequate discussion, or framework proposed-either in this discussion paper, or in the discussion paper on access to biological resources -for the protection of Indigenous knowledge, and the recognition and protection of Indigenous rights in regard to access, control and ownership of biological resources, whether on Commonwealth lands or elsewhere.

Recommendations for greater control by, and participation of Aboriginal and Torres Strait Islander people in the management of environment and conservation, including national parks and protected areas have been made by many reports over the decades. Some noteworthy examples of these reports include the comprehensive and significant 1991 national report of the Royal Commission Into Aboriginal Deaths in Custody (especially Recommendation 315). (53)

Despite this proliferation of reports and recommendations, there has been relatively little in the way of implementing environment and biodiversity related recommendations. Another area in which recommendations and reports abound in large proportion relative to their implementation is that of intellectual property rights-which are also relevant to the protection of Indigenous knowledge.

**Intellectual property rights**

There has been some attention focussed recently on the issue of Indigenous intellectual property rights. This has largely been prompted by the release by the former Keating Government in 1994 of an issues paper called Stopping the Rip-Offs: Intellectual Property Protection for Aboriginal and Torres Strait Islander Peoples. To formulate its response to this paper, the Commonwealth Government established an interdepartmental committee chaired initially by the Attorney-Generals Department, and subsequently by the Department of Communications and the Arts. As a part of this process, the Aboriginal and Torres Strait Islander Commission (ATSIC) has sought Indigenous views regarding the recognition and protection of intellectual property rights.

The Stopping the Rip-Offs paper stated that its aim was to consider only the protection of what was termed 'arts and cultural expressions', and these only insofar as they related to the Copyright Act 1968. The principal focus was on finding suitable remedies to the appropriation of Aboriginal art that had been occurring for decades. The effectiveness of the Copyright Act in preventing these appropriations was a central consideration. The government view therefore expressly excluded the protection of Indigenous knowledge in biodiversity from this process.

Notwithstanding these limitations, ATSIC advocated that since Indigenous peoples considered that their intellectual property rights did extend to knowledge in biodiversity, then any reforms to protect Aboriginal and Torres Strait Islander intellectual property must necessarily also include consideration of knowledge and biodiversity. ATSIC's involvement in the formulation of a response to the Stopping the Rip-Offs paper therefore adopted a broader view, consistent with Indigenous peoples' aspirations.

ATSIC established an Indigenous Reference Group comprising Aboriginal and Torres
Strait Islander people with expertise and experience in cultural heritage, the arts, and law, to provide advice and to manage the consultations with Indigenous peoples. ATSIC also funded the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) to further develop an Indigenous perspective. In 1997, AIATSIS released a discussion paper entitled Our Culture, Our Future: Proposals for the Recognition and Protection of Indigenous Cultural and Intellectual Property. This paper includes consideration of possible reforms, legislative, policy and administrative to protect Indigenous rights in knowledge and biodiversity.

The final report of Our Culture, Our Future, released in mid-1998, makes some 115 recommendations covering a very wide range of law, policy, program and administrative subject areas. These recommendations include suggesting amendments to legislation dealing with cultural and intellectual property rights, land, environment and heritage. They also advocate a range of administrative and common law measures. Arguably the most far reaching recommendation calls for the introduction of sui generis legislation that specifically provides for recognition and protection of Aboriginal and Torres Strait Islander peoples' cultural and intellectual property rights-including rights in biodiversity and traditional knowledge.

Reforms to existing intellectual property rights laws can extend the capacity of these laws to recognise and protect intangible cultural expressions such as knowledge, and to shift the balance in these laws from fostering commercial innovation, towards protecting cultural rights. The introduction of moral rights provisions to the Copyright Act is a step towards these types of reforms. Similar moral rights provisions could also be considered for patent laws.

Native title and regional agreements

The Mabo decision and the Native Title Act 1993, as some writers have argued, provide an impetus for the recognition of Aboriginal and Torres Strait Islander peoples' rights in, and knowledge and practices regarding environmental management, and the incorporation of these into existing management regimes.(54) Flowing from the recognition of common law rights in land, both the Mabo decision and the Native Title Act 1993 also establish principles for the recognition of other types of Indigenous customary property rights, including rights in knowledge.(55) The content of native title is defined as being based on the laws and customs of the Indigenous claimants although the precise nature of this content will ultimately be determined in the courts.

The content of native title 'has its origin in and is given its content by the traditional laws acknowledged by and the traditional customs observed by the indigenous inhabitants of a territory' (56), and may be shown to include Indigenous knowledge of country. Since native title is defined according to the customs and traditions of the claimant group, this by definition must imply the inclusion of Indigenous knowledge as a form of intellectual property, because to Indigenous peoples, their 'knowledge of the properties of fauna and flora' is an important component of customary laws. (57)

Another aspect of the native title process that potentially has the capacity to provide recognition of Indigenous rights in knowledge and biological diversity, is the process...
of negotiated agreements, known as regional agreements or Indigenous Land Use Agreements. Negotiated agreements may be developed either within the provisions of the Native Title Act (the Preamble and Section 21), or as independent processes. Section 21 of the Native Title Act provides a potential stimulus for the negotiated settlement of claims, and a possible mechanism for the achievement of a measure of autonomy for Indigenous peoples.

A regional agreement may include negotiated arrangements covering virtually any aspect of government, delivery of services, access to, and management and control of areas, resources and sites, protocols regarding research, survey and development activities, and so on. They may also include negotiated arrangements for the integration of Indigenous knowledge, and customary uses and practices regarding land, environment, and biological materials into land and environment management plans and strategies.

A regional agreement 'denotes the concept of equitable and direct negotiations between Indigenous peoples, governments and other stakeholders in a region to recognise the rights of Indigenous peoples and to protect them under a contemporary legal system'. A regional agreement 'should not take any pre-ordained form...[but]...'is a means for Indigenous peoples to define our own solutions and obtain legal, administrative and political recognition for such definitions'.(58) One working definition of regional agreements is as:

...a way to organise policies, politics, administration, and/or public services for or by an Indigenous people in a defined territory of land (or of land and sea).(59)

A regional agreement could, in principle, provide for the recognition of Indigenous peoples' rights to control their own destinies.(60)

Discussions about Australian regional agreements are influenced by Canadian developments such as the James Bay and Northern Quebec Agreements. These types of agreements often include regimes for the management of environment and heritage. One commentator has suggested that 'the comprehensive claims process underway in Canada is often touted as the solution to issues of Indigenous land management, self-determination, management of public sector programs and services, and native title in Australia'.(61)

In Australia, the development of regional agreements is currently focussed on processes, rather than on the likely content of such agreements. The present amendments to the Native Title Act include several provisions relating to Indigenous Land Use Agreements (ILUAs). The term Indigenous land use agreements:

encompasses agreements which may provide for recognition or transfer of the ownership of country which may or may not be coupled with the authorisation of mining, pastoral or other developmental activities by indigenous and non-indigenous interests acting jointly or separately. It covers vesting and joint management of parks and reserves and agreements for the co-existence of Aboriginal and non-Aboriginal
Indigenous peoples and their supporters have argued that such land use agreements are the most appropriate way to develop shared approaches to managing access and other rights and responsibilities over pastoral leaseholds. These ILUA proposals provide more detail than the Section 21 provision in the Native Title Act, since they offer a 'flexible system to assist in the making of agreements which may affect native title', and 'represent a lasting and economical means of resolving native title issues'.

The main concerns in current negotiations regarding agreements are with the 'regulation of resource extraction and commercial use of the land', and as noted by one writer, 'conservation values are a latecomer to the equation, but of increasing influence and importance', since 'efficient exploitation and management of resources is one of the principal factors that has led to the need for comprehensive negotiated settlements whether native title is recognised or not'.(63)

Given the diversity of possible arrangements that may be relevant to the potential inclusion of Indigenous knowledge and practices, it is feasible to cite many examples of such arrangements. The Cape York Heads of Agreement, and the agreement between Quandamooka Land Council and Redland Shire in Queensland, are just two examples of agreements that have specific references to Indigenous knowledge, Indigenous cultural and intellectual property, or environmental management.(64)

**Other contracts and agreements**

Contracts and agreements can potentially offer powerful mechanisms for including recognition and protection of Indigenous knowledge and practices. Contracts that have been developed between the pharmaceutical company Amrad and some Aboriginal representative organisations for bioprospecting may be models for a wider national approach.

The Commonwealth Government's Indigenous Protected Areas Program is another initiative which offers a potential basis for developing systems for the recognition and protection of Indigenous knowledge and practices relating to environmental conservation and management. This program aims to develop partnerships between Indigenous landholders and government conservation agencies. Although still in its developmental stage, this program has the potential for incorporating in such partnerships agreed strategies for the protection and appropriate management of biodiversity related knowledge, and for equitable sharing of benefits with the Indigenous knowledge holders.(65)

Jointly managed national parks also provide good models for incorporating and protecting Indigenous knowledge, innovations and practices. One example is Uluru-Kata Tjuta National Park, which is a model of a negotiated sharing arrangement between the Aboriginal traditional owners, and conservation management agencies.(66) The management plan for this park incorporates Aboriginal traditional knowledge and environmental management practices, based on the principle of Tjukurpa, which is the custom and law of Anangu people, the parks traditional Aboriginal owners.(67)
Land and heritage

Federal legislation such as the *Aboriginal Land Rights Act (NT) 1976 (Cwlth)* and the *Aboriginal and Torres Strait Islander Heritage Protection Act 1986* provide potential avenues for incorporating reforms to include protection of Indigenous knowledge. Relevant land and heritage laws in state and territory jurisdictions may also provide opportunities for recognising Indigenous knowledge.

Existing Commonwealth heritage protection legislation is limited in its capacity to protect Indigenous knowledge, as it protects only physical heritage. This legislation, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* has recently been the subject of considerable attention in the Hindmarsh Island case, which illustrated some problems regarding protection of secret knowledge. There has been considerable work carried out in recent years to review and assess the effectiveness of this Act. One such review, completed by the Hon. Elizabeth Evatt in 1996, made some recommendations to improve the operation of this Act.(68) These recommendations included advocating the implementation of measures to recognise and protect Indigenous secret and sacred knowledge relating to heritage. The Act is presently the subject of proposals for reform, which will, if implemented, effectively devolve responsibility for decision making over Indigenous heritage to state and territory governments.

Common law solutions

The potential for recognition and protection by statute law is given support by a number of common law cases in recent decades that have implications for recognition of Indigenous customary law and traditional knowledge. Some of these have been specifically brought under the Copyright Act, and the resulting decisions have gone some way toward extending the interpretation of copyright law to accommodate Indigenous cultural perspectives. Among the cases most significant for the potential recognition and protection of Indigenous knowledge, practices and innovations relating to biodiversity are *Milirrpum v Nabalco Pty. Ltd.* (1971), *Foster v Mountford* (1976), and *Milpurruru v Indofurn Pty. Ltd.* (1995). These are discussed in Research Paper No. 20 and elsewhere.(69)

Administrative and policy reforms

A range of administrative reforms are suggested in the report *Our Culture, Our Future*, which could provide protection for Aboriginal and Torres Strait Islander peoples' cultural and intellectual property rights. These include measures such as a Public Domain Royalties System, and Cultural Contracts.

Integrating different knowledge systems: Indigenous knowledge and western science

One of the challenges to law and policy for the recognition and protection of Indigenous knowledge is to develop ways in which there can be an integration, or a
harmonising of Indigenous biological and environmental knowledge and practices with western scientific knowledge. In this way, rather than being considered as conflicting systems, Indigenous knowledge systems and western scientific knowledge can be combined in a way which utilises the characteristics of two different systems in a complementary, mutually reinforcing way. Such an integrated knowledge system can be developed in order to pursue mutual goals such as land and ecosystem management.

There are many examples of ways in which the integration of Indigenous knowledge systems and western scientific approaches can be integrated. These include ecological, botanical and faunal surveys using Indigenous knowledge, and the incorporation of Indigenous knowledge and practices regarding land and environmental management into national parks, and in the development of strategies for managing a variety of ecosystems such as rangelands, wetlands, and marine environments. The development of programs aimed at establishing Indigenous protected areas, and land and environment conservation activities such as landcare regimes are also ways in which Indigenous and non-Indigenous knowledge and practices can be harmonised.

Conclusions

The recognition and protection of Indigenous peoples' rights in their knowledge, innovations and practices relating to biodiversity is assuming an increasing urgency. Indigenous knowledge makes a significant contribution to the collection and screening of plant-related substances, and the development of commercial products such as pharmaceuticals from these. Often, however, the contribution made by Indigenous knowledge, innovations and practices is unacknowledged, and little or no financial benefits are returned to these knowledge holders and innovators for their contribution.

The Convention on Biological Diversity is the single most important international instrument that provides potential for developing measures for recognition and protection. Its provisions regarding benefit sharing are especially important.

While conventional intellectual property rights systems are largely ineffective in providing recognition and protection for Indigenous knowledge, there are some other avenues that have the potential to offer solutions.

Alternatives to intellectual property systems offer the most productive opportunities, especially the introduction of frameworks that provide specifically for the recognition and protection of Indigenous knowledge.

Contractual arrangements, agreements and partnerships for land and environment management and conservation offer considerable potential for incorporating mechanisms for recognition and protection of Indigenous knowledge, innovations and practices relating to biological resources. In designing these kinds of approaches, however, it is of primary importance to ensure that they provide for Indigenous peoples to share equitably in benefits derived from the wider uses of their knowledge, innovations and practices. The risk is, as highlighted by the Commonwealth State Working Group report, that the focus will be on supporting the provision of benefits to
states and other powerful interest groups—at the expense of Indigenous peoples within state jurisdictions.

State and territory laws and policies relevant to conservation, and the recognition and protection of Indigenous rights are diverse and ad hoc. For this reason, the Commonwealth has an important role in developing a national approach to achieve recognition and protection of Indigenous rights in biodiversity related knowledge and practices, while at the same time providing for the interests of conservation, and of industry.

This system, modelled on successful local and international developments, could be developed to meet the interests of all participants. It would provide for the recognition and protection of Indigenous knowledge, innovations and practices, enable bioprospecting to occur, with prior informed consent of knowledge holders and custodians. It would provide for the equitable sharing of benefits—both financial and non-financial with knowledge holders and custodians, and it would provide incentives for the conservation and sustainable management of biological diversity.

Endnotes


6. ibid., p. 37.

7. ibid., pp. 35-36.


9. ibid., also see Australian Institute of Aboriginal and Torres Strait Islander


14. See for example, Howard Morphy, "'Now you understand'": an analysis of the way Yolngu have used sacred knowledge to retain their autonomy', in Nicholas Peterson and Marcia Langton (eds), *Aborigines, land, and land rights*, Australian Institute of Aboriginal Studies, Canberra, 1983, pp. 110-133.


20. There is an extensive, and growing body of literature on Indigenous knowledge, intellectual property, and bioprospecting; see for example Josephine R. Axt, M. L. Corn, M. Lee, and D. M. Ackerman, *Biotechnology, Indigenous peoples and intellectual property rights*, (Report for Congress, CRS 21), Congressional Research Service, Washington, DC, USA, 16 April 1993; Stephen B. Brush,


23. ibid., p. 8.

24. For details see Michael Davis, op.cit.


27. See for example the introduction by the Philippines of a law, Executive Order No. 247, which regulates the research, collection and use of biological and genetic resources.


33. Refer also to Davis, op. cit for additional details.


35. ibid; see also the range of initiatives, including alternative sui generis intellectual property rights systems discussed in Rural Advancement Foundation International (RAFI), Conserving indigenous knowledge: integrating two systems of innovation, Ottawa, Canada, 1994, pp. 48-54.


37. ibid., pp. 254-255.


40. ibid., p. 19.

41. RAFI, op. cit., p. 49.

42. Axt, et al., op. cit., p. 13.

43. Oddie, op. cit. p. 19.


45. ibid; Darrell A. Posey, Traditional resource rights: international instruments for protection and compensation for indigenous peoples and local communities, IUCN-The World Conservation Union, Gland, Switzerland, 1996.

46. Dermot Smyth, A voice in all places: Aboriginal and Torres Strait Islander interests in Australia's coastal zone, Consultancy Report to the Resource Assessment Commission's Coastal Zone Inquiry, Canberra, November 1993,


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60. See for example Frank Brennan, Michael Davis, et al, Controlling destinies: greater opportunities for Indigenous Australians to control their destinies, (Key issue paper no. 8), Council for Aboriginal Reconciliation, AGPS, Canberra, 1994, pp. 42-45.


64. A range of agreements is mentioned in Rick Farley, Tony McRae, and Patricia Lane, 'Outlook for regional development: opportunities for regional agreements', paper presented to the Northern Australia Regional Outlook Conference, Darwin, 24 September, 1997.

65. The Indigenous Protected Areas Programme is outlined in Dermot Smyth and Johanna Sutherland, Indigenous protected areas: conservation partnerships with Indigenous landholders, Consultants Report to Environment Australia, Commonwealth of Australia, Canberra, November 1996.

66. See David Lawrence, Managing parks/ managing 'country': joint management of Aboriginal owned protected areas in Australia, Research paper no. 2, 1996-97, Parliamentary Research Service, Department of the Parliamentary Library, Canberra, 1996.


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