Chapter 5

IW perpetrated against the developing world

5.1 Introduction

Chapter two examined the nature of information warfare (IW) and adopted an Information Science perspective or approach in investigating IW in this thesis. Chapter four determined that indigenous knowledge (IK) is a form of intellectual property (IP) which is more prevalent in the developing world. This chapter builds on the previous three chapters and links with them in that it determines the extent to which IW is perpetrated against IK. Issues discussed in this chapter are therefore limited to the subject of IW as it related to IK. This chapter further illustrates how IW is being perpetrated against the developing world through the presentation of various cases. In an attempt to answer the main research problem statement, this chapter answers the following research sub-question:

What is the current state of IW against IP?

Several international conventions have attempted to harmonise IP throughout the world. The 1993 UN Declaration on Human Rights of Indigenous Peoples recognizes the urgent need to respect and promote the inherent rights and characteristics of indigenous peoples. This pertains particularly to their rights to their lands, territories and resources, which they derive from their cultures, spiritual traditions, histories and philosophies, as well as from their political, economic and social structures. This declaration supports the importance of investigating the issues that reflect IW against indigenous people. These issues centre on the process through which indigenous people are denied access to products originally derived from their own indigenous resources.

The aims of this chapter are to:

- prove that IW is being perpetrated against IK
- investigate various IW-based cases where IK has been appropriated without compensation to the locals
- advance some reasons for a need to protect IK

The need for a proper IK protection system go beyond the harmonisation of IP laws. It is thus very important to understand IK as property, irrespective of whether it is a communal or personal good, before discussing its commercialisation or appropriation.

5.2 IK as property

The concept of property centres on a person's rights to something owned. Property may be tangible such as land, natural resources, and goods, or intangible like services and knowledge. In the world view of indigenous people, property has intangible, spiritual manifestations. Although, in their view, property is worthy of protection, it may belong to no specific individual. As discussed in the previous chapter, IK is a property that exists within communities. The privatisation of indigenous resources is not only a foreign idea, but is incomprehensible or unthinkable to traditional communities. Communal property is the system used in most traditional societies to control access to basic resources. Traditional resources include plants, animals and other material objects, minerals and cultural artefacts. Some of these objects may have intangible qualities. The term 'property' is said to be inappropriate since traditional resources have intangible, spiritual manifestations, which are not considered to belong to any human being. IK is said to occur in the public domain mainly because it is oral and intangible. At the interface with modern society, knowledge in the public domain can be used by any person as soon as it leaves the community, and there is no clear obligation to return benefits to the community. The term 'traditional resource rights' emerged to define a bundle of rights that can be used for protection, compensation and conservation but should not be seen in isolation from IK (IUCN 1997:74-75).

The notion of individual ownership of patent rights arising from a product developed on the basis of IK is foreign to the values of indigenous populations. Property exists predominantly as a communal resource in many indigenous societies. Much of what the Western world would consider proprietary is considered communal in an indigenous society. IK may acquire further value when it is taken out of its natural setting and commercialised in a proprietary manner. It would be contrary to the accepted values of an indigenous population for one person in their community to be named the inventor or owner of what is considered to be communally held. The position of respect and leadership is generally attributed to the traditional healer or shaman. The problem arises when one attempts to place a monetary value on IK or its contribution to the natural drug product discovery effort (Mays, Mazan, Asebey, Boyd & Cragg 1996:266-267).

One of the dangers that may face an indigenous community that has obtained a patent is that others may infringe their patent right. The community may not know about it, and even if it finds out, legal action can be very expensive. Large corporations have their own lawyers and financial resources to provide legal support, while local communities rarely have such resources and advocates. There are some technological innovations derived from IK that preceded the industrial revolution and which are not recognised as proprietable because they exist in the public domain. They include fire, domestication of animals, irrigation, smelting of ores, geometry, architecture, and others. Some of these forms of knowledge are also relevant to the developed world. Also, older people have different types of knowledge to the young. Common knowledge is held by most people in a community; for example, almost everyone knows how to cook the local staple food (Goodchild 2000:344; Klopper & Van der Spuy 2000:1; Oddie 1999:239; Ostergard 2001:644; Patel 1996:307).

The fact that a trademark distinguishes one product from another makes it possible for a consumer to prefer one product to the other. Indigenous communities cannot always afford to market their products across the world and some multinational corporations may take advantage of this by marketing indigenous goods under their own trademarks. For this reason a trademark is economically valuable. Because of this value, the law affords entrepreneurs protection against the unlawful use of their

trademark by other entrepreneurs. The goods and products from any emerging markets would be disadvantaged by strong and well-established products, which are usually sponsored by the multinationals (De Villiers 2000:74; Doyle 1995:184; Klopper & Van der Spuy 2000:5; WIPO 2000:38).

Traditional products and the healing properties of the flora and fauna found in the African continent are regarded as an inheritance. In the African milieu, traditional medicine occupies the same position as pharmaceutical medicine in the modern world. However, pharmaceutical products are regarded as proprietable commodities whereas traditional medicine is regarded as part of common knowledge within the developing communities. For this reason, they are said not to satisfy the requirements of novelty and non-obviousness, but they satisfy that of utility. Transmission of knowledge within the indigenous fraternity is thus threatened. In addition to these threats, the voluntary nature of traditional education and social disturbances greatly affect essential cultural values such as traditional medicine. IK in Africa was not explored during colonialism because it was believed that Africans had little knowledge to impart and that African land-use practices were primitive and destructive compared to European techniques. Postcolonial educated Africans supported Western models of development. Only recently has there been substantial interest in IK and skills among the African élite and Westerners (Aboubacrine & Hinan 1998:121).

Some indigenous practices adapted or improved with available technology and have been registered as patents. For instance, the healing power of some plants has long been known and used by traditional communities. Knowledge of the healing properties of such plants was passed down from generation to generation. Such knowledge of healing resided in the community, and every community member could benefit from it. In addition, traditional healers benefited from the recognition and acknowledgement they received from fellow tribesmen. Some of this medicine was further processed and patented by individuals from the developed world, most of the time at the expense of the developing world (AEFJN 2002:1; Republic Act No. 8371).

It is evident that even though IK is not formally recognised as property, it is a commodity that is very profitable to those who derive economic benefit from it. IK is protected as a legal commodity and is recognised as such by those who discovered its commercial value. The value of IK within the developed world must be extended to cover the unexplored IK that still exists within developing communities.

5.3 Effects of biopiracy on IK

Biopiracy, which is closely related to bioprospecting, originates from the discipline of biotechnology. Both biotechnology and biopiracy are relatively recent terms in the English language. The original Greek word 'bio' pertains to life and living things. Biotechnology combines technological processes with living things. The term 'biotechnology' developed alongside increased research into processes for manufacturing or manipulating the development of various plants and animals. Such research includes the ability to manipulate gene sequences to create plants and animals with characteristics different to those existing in nature (Lipton 2000:204).

Bioprospecting is defined as the exploitation of natural resources for commercial purposes. Opponents to this practice refer to it as biopiracy, as it "steals" the resources from the developing countries and does not recognise at any moment the economic and cultural value of these resources for local people, or the latter's contribution to their conservation (Le Roy 2000). For the purpose of this thesis, the term biopiracy is preferred to bioprospecting. Biopiracy is the unauthorised appropriation and commercial exploitation of IK. According to Shiva (Shah 2001),

> Biopiracy and patenting of IK is a double theft because first it allows theft of creativity and innovation, and secondly, the exclusive rights established by patents on stolen knowledge steal economic options of everyday survival on the basis of our indigenous biodiversity and IK. Over time, the patents can be used to create monopolies and make everyday products highly priced.

Since biopiracy is mostly perpetrated against IK, it is important to discuss how it affects the latter. Following this, various cases on its appropriation will be discussed.

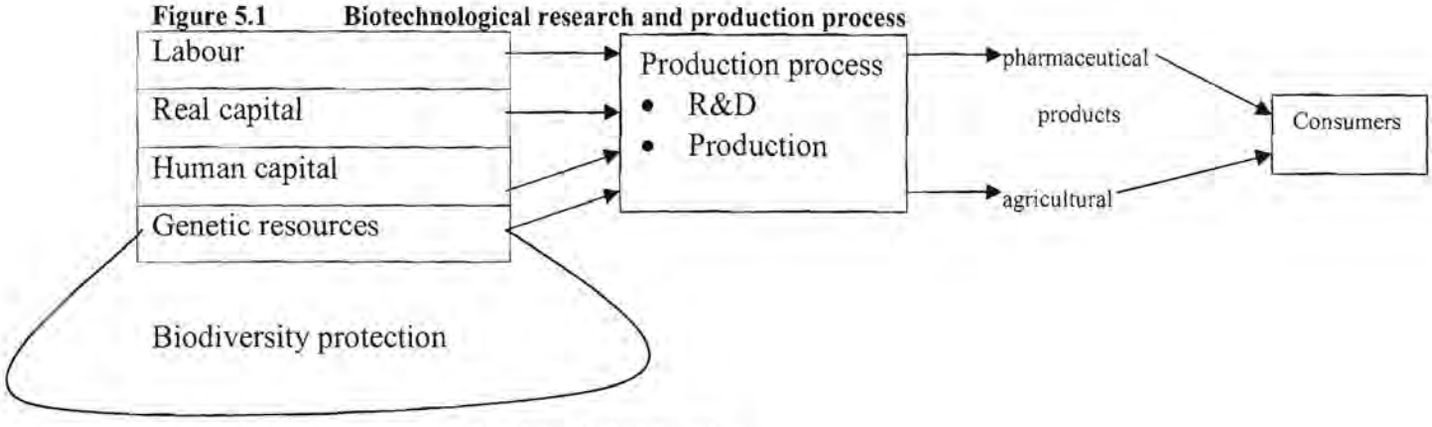
According to TRIPS, many commercial high-yielding seed varieties may be patented. This will not allow plant breeders to use protected seed for further research on development. However, farmers are allowed to save protected seed varieties from a current year's crop and use or sell them as stock for subsequent years. Approximately 80 percent of seed requirements in India are met by sales between farmers. It is feared that, over time, multinational seed companies will slowly patent the most useful genetic seed materials that exist in the international gene bank. TRIPS opponents fear that seed monopolisation via TRIPS may increase seed prices. India is thus still considered to be a predominantly biodiversity-based economy (Bhat 1996:210; Shiva 1996:2). The patenting of the Neem is an example of a case where traditional resources are monopolised through patent protection by corporations without any benefit to the original holders of the knowledge.

There are 119 drugs with known chemical structures that are extracted from plants and used in industrialised countries. Over 74 percent were discovered by chemists attempting to identify the chemical substances in plants used in traditional medicine. Certain problems are created when exclusive property rights are granted to the discoverer of genetic or biochemical information contained in genetic resources, or to the creator of knowledge about the utilisation or processing of this information. Such problems centre on the conflict between the social objectives of the efficient utilisation of already existing information and the provision of incentives for the creation of new information and knowledge. This conflict is demonstrated in the concern that granting IPRs like patents creates monopolies (Drahos 1996:65; Ganguli 2000:168; Janssen 1999:318).

A new trend exists whereby foreign countries or multinational corporations in developed countries have a huge interest in medicinal plants available in developing countries, such as India. Such information is sometimes well-documented, indicating the formulation in which they are used. It is a fact that to date, a number of medicinal plants and their uses have been patented in foreign countries. There has been criticism

pertaining to the growing trend of patenting indigenous medicinal plants and their uses. Some of the well-known plants indigenous to India such as Kala Zeera, Amaltas, Indian Mustard, Karela, Brinjal, Neem, Gudmar, and so on, have patents. Some of these patents have been successfully contested by India (Rawat 2002:1).

Figure 5.1 Biotechnological research and production process



Source: Janssen 1999:314, figure 1 (adapted)

In economics, genetic resources are considered to form part of natural resources that are defined as factors of production provided by nature. In combination with production factors such as labour, real capital and human capital, these natural resources are employed to produce goods that are of value to individuals and society. Genetic resources are especially used in agricultural and pharmaceutical research, development and production processes. The functional relationship between the input of genetic resources, labour, real and human capital on the one hand, and the agricultural or pharmaceutical output on the other hand, may be described by a production function (Janssen 1999:314). Figure 5.1 depicts the overall process of the biotechnological research and production process.

Indigenous people are becoming more aware of and concerned about the danger of biopiracy. The common danger is that indigenous people's territories are expropriated for ownership by corporations or by the state. Governments frequently claim ownership of indigenous people's land and then remove them or allow them limited usufruct rights. Without ownership rights, indigenous people cannot control access to their resources. The 4th International Congress of Ethnobiology, held in India in November 1994, considered the problem as being due to the failure of governments,

development agencies and other institutions to understand IK. They fail to respect its scientific basis and fail to recognise the IP rights of indigenous people (IUCN 1997:73-5; Shiva 1996:29).

With WIPO essentially overseeing the buy-in to the IPR system, and since its scope of work is determined by industries whose economic interests run counter to the rights of indigenous people, it is unrealistic to expect this organisation to work miracles on behalf of communities. Recognising this, anthropologist Darrel Posey (in Johnston 2000:94) has proposed a more viable concept called traditional resource rights (TRR). Many indigenous people find the TRR concept useful, and see it as a complement to developing protective mechanisms on the basis of their respective customary laws. Institutional support focuses on more generalised and exclusionary approaches, such as the Internet dialogue on IK moderated by the World Bank in 1998 and the new UNESCO work programme on IK (Johnston 2000:94).

US courts have ruled that genetic sequences can be patented even when the sequences are found in nature as long as some artificial means are involved in isolating them. This led to a race among companies to take out patents on numerous genetic codes. The lack of recognition of IK systems and lack of legal regimes to protect them led to the phenomenon of piracy. To stop this piracy and its destruction, IPRs and biodiversity legislation need to define and defend indigenous people's rights (Martin 1995:8-9; Shiva 1996:29-30).

Current patent laws are based on the assumption of the hero inventor or team hero inventorship programme. It has been argued that attempts to apply or adapt patent laws as a means to compensate indigenous populations are futile. There have been calls for the creation of a new legal concept that incorporates non-Western models of intellectual and cultural property. Such a legal concept would provide a broader scope of protection than is currently available under existing IP law (Mays et al. 1996:267).

Because of poor IP protection of patents in developing countries, individuals or corporations are met with no opposition when they plunder and export biological specimens and traditional knowledge from developing countries without due respect

for local communities' know-how or any equitable benefit sharing. Some developing countries argue, however, that the lack of adequate legislation allows their young industry to copy inventions and thus contribute to the emergence of a national industry at low cost (AEFJN 2002:7). Despite arguments that argue against IK as a form of property, it seems clear that it can indeed be considered property in its own right. Furthermore, it should be recognised as a property that can be linked to a community or individual. The next section considers cases in which IK was appropriated by the industries in the developed world without proper compensation, recognition or consultation of the relevant indigenous people.

5.4 Case studies

This section determines that IW has indeed been perpetrated against the developing world. This is done by investigating various cases that involve the appropriation of resources from indigenous communities. The cases investigated are more inclined towards the developing world because IK-based IW outside the developing world is not part of the subject of this thesis.

People can also be barred from information about indigenous resources. This fits properly in the Information Science perspective on IW. The Information Science approach to IW will be used to determine that IW has been perpetrated against the indigenous community under discussion. The aspects to be considered in each case in order of importance are biodiversity, traditional names and tourism. The following cases have been selected to prove the existence of IW against IK within the developing world.

5.4.1 Biodiversity

5.4.1.1 Thaumatin and Africa IP legislation

This section focuses on IW perpetrated against the developing world with an emphasis on the African context. African religious and cultural traditions regard the extension of patents to living organisms as intrinsically wrong. The claim to human

invention in relation to living material violates the belief in a divine creator and the notion that life is a gift, the shared inheritance of human kind. Patenting life forms reduces the value of life and nature to merely economic commodities. Many raise the question of whether patents on life forms is not an inappropriate extension of private ownership to resources that should be held in common. Unlike in industrialised countries, where the culture of profitability and production reigns, rural societies and African countries protect traditional communal rights and indigenous innovation and knowledge (AEFJN 2002:11). The case of thaumatin is discussed in this regard.

Thaumatin is a natural sweetener derived from the berries of a shrub called the Katemfe, *Thaumatococcus danielli*, which grows in the west and central African forests. This protein, which is 2000 times sweeter than sucrose, was discovered by researchers from the University of Ife, Nigeria. The berries were used for centuries by traditional people as a sweetener and flavour enhancer. In some areas the stalks and leaves are used while the berries are considered waste. Thaumatin was later used by food and confectionery industries in a number of countries. It was sometimes marketed as a low calorie sweetener and has been used to feed animals (IUCN 1997:76; Posey & Dutfield 1996:82).

A British sugar company, Tate & Lyle, has marketed the product under the name Talin. Since the plant could not bear fruit outside its natural surroundings, the company decided to import the fruit from its own plantations in Ghana, Ivory Coast, Liberia and Malaysia. The method of extraction is expensive and a number of companies attempted to apply recombinant DNA technology to the gene responsible for the thaumatin protein. Beatrice Foods obtained a patent in the USA for the process of cloning the gene in the yeast. Researchers from the Lucky Biotech Corporation and the University of California received a US patent for all transgenetic fruits, seeds and vegetables containing the gene responsible for thaumatin. The countries in which the Katemfe is grown do not benefit from the export of the berries (IUCN 1997:77; Posey & Dutfield 1996:82). If well-established IP laws existed in African countries, Katemfe might not have been exploited the way it has been. This makes it important to investigate the impact of existing IK-related legislation in Africa.

The Organisation for African Unity, predecessor of the African Union, was aware of the need for an IPR protection system compatible with WTO regulations, yet needed to consider the needs of African countries. Therefore, in 1999, it proposed a model law for the protection of the rights of local communities, farmers and breeders and for the regulation of access to biological resources. In their efforts to establish a WTO-compatible IPR protection law by 2006 at the latest, African countries are encouraged to incorporate into their national IPR legislation elements of this model law. Equitable IPR protection for African states is based on the African Model Law (AML) for the protection of the rights of local communities, farmers and breeders and for the regulation of access to biological resources (AEFJN 2002:12). Table 5.1 indicates the national legislation in some African countries in relation to the AML.

Table 5.1 National legislation in relation to the provisions of the African Model Law (AML)

Country	African national legislation approach
ALGERIA	Has legislation on environment and community rights, and government is very much aware of the AML proposals.
OAPI	The ministerial meeting of the *Organisation Africaine de la Propriété Intellectuelle*, that assembles 15 francophone African countries, agreed in 1999 to UPOV91. Pressure from the OAU and NGOs stopped its ratification in most countries and AML components are now being considered.
BOTSWANA	Legislation on access to biodiversity, farmers' rights and community rights is in process. UPOV91 rejected by ministries of trade and agriculture.
ETHIOPIA	Legislation on access and community rights has been submitted to parliament.
MADAGASCAR	A law on biodiversity access and benefit sharing has been prepared and is discussed by various ministries.
NAMIBIA	Has IPR legislation very close to the AML, most advanced pro-biodiversity and community law in Africa.
SOUTH AFRICA	Has legislation on community rights except for plant resources as its Plant Breeders'Act complies with UPOV91.
UGANDA	The OAU model is used to draft a law on biosafety, however community rights, plant breeders' rights and access are treated separately according to the South African model.
ZAMBIA	Legislation has been drafted and is awaiting discussion in parliament.

Country	African national legislation approach
ZIMBABWE	Ministries of Trade, Agriculture and Environment are studying guidelines to develop implementation of the AML.

Source: AEFJN 2002:13 (adapted)

This case of the protein plant in the central and western African regions explicitly proves the existence of IW in which appropriation of local resources resulted in a commercially viable product, but excluded poorer communities from benefits deriving from the products. Locals who purchased the products were not even offered discounts, because foreign companies controlled most of the forests where the protein plant was grown . To make matters worse in this case, the plant could not grow outside its natural habitat and the prospecting companies had to own farms in countries suitable to produce the berries. Despite this, the countries never benefited from the export of the plant product.

Not only do countries in which the Katemfe is grown not benefit from the export of the berries, but access to the berries by the indigenous people was seriously curtailed. This proves that commercialisation in the developing world which is orchestrated by multinationals is detrimental to the sustainability of indigenous resources of the poor.

5.4.1.2 India: Neem case

India is one of the biggest countries in the developing world, with a population of approximately one billion people, and an enormous number of plant species, including those with healing properties. It is therefore important to consider an Indian case study in terms of IW on its indigenous resources. Many people in India make a living through utilising the country's biodiversity. Approximately seventy percent of healthcare needs in India are based on the traditional use of medicinal plants. Research into biopiracy has provided many examples of how knowledge can be extracted from its local context and injected into Western knowledge systems. For centuries people have been collecting knowledge and biological resources from indigenous people for commercial ends (biodiversity prospecting) and this trend has

recently intensified. While Biodiversity prospecting may sometimes benefit the local community, it is rapidly becoming another form of exploitation (IUCN 1997:70; Shiva 1996:1-2).

Seeds of a species of Neem tree, *Azadirachta indica*, are scattered by Indian farmers to protect their crops from insect pests. The Neem tree also seems to possess properties that make it an effective treatment against malaria and internal worms. Its leaves are used to protect stored grain from pests and clothes from moths. Neem oil is used to make candles, soap and contraceptives and can even fuel diesel engines. Approximately 500 million Indians reportedly use Neem twigs as a toothbrush. Most of these discoveries were first made by members of the Indian rural communities (IUCN 1997:71; Posey & Dutfield 1996:80; Shiva 1996:12).

Two companies, W.R. Grace and Agrodyne, obtained patents in the United States for derivatives of Neem developed in their laboratories, even though the insecticidal, human non-toxic and biodegradable properties of Neem are far from novel and non-obvious to millions of Indian farmers. Another patent has been granted in the USA for an extract of Neem bark, which is effective against certain types of cancer. W.R. Grace and PJ Margo, an Indian company, undertook a joint venture to produce Neem-based pesticides. These companies required assistance from the Indian farmers to use the Neem. The Indian Agriculture Minister drafted the Plant Variety Act to fulfill the *sui generis* system to cover medicinal plants (IUCN 1997:72; Shiva 1996:3; Posey & Dutfield 1996:80; Shiva 1996:3).

The farmers are in a weak position to demand compensation because the knowledge of Neen's various healing properties is widespread and in the public domain. India too has weak claim because the tree is native to neighbouring countries and is now grown around the world. Many patents that are closely related to IK need to be challenged. Nature's diversity is undergoing a major process of destabilisation with the expansion of patents and IPRs into the domain of biodiversity via TRIPS and WTO (Ellen & Harris 2000:12; IUCN 1997:72; Shiva 1996:2).

IP issues in India were given wide recognition after farmers demonstrations in the early 1990s against the transnational seed company Cargill. Currently, the struggle continues against the introduction of genetically-modified terminator cotton seeds by the global life science movement. The culture of farming has been subverted in that seed breeders and providers were transformed to buyers of seed; and the traditional meaning of seed as a symbol of fertility was altered to a symbol of sterility. These processes have led to real human suffering (Thomas 1999:223).

Globalisation has resulted in the transformation of an indigenous plant, used by traditional communities for generations, into commercial products by foreign companies. This transformation has not been to the benefit of the local people because it is claimed that the information about its properties is in the public domain.

The fact that W.R. Grace and Agrodyne obtained patents in the United States for derivatives of Neem, despite the claim that this information is common knowledge in India, is not fair to the Indian farmers. A patent is a commercial commodity that gives the patent holder a legal monopoly over the exploitation of a product. This means that the indigenous communities could no longer exploit the Neem as they had traditionally done. This seriously restricted the access of the indigenous Indian community to the plant species they had used for generations. They now had to buy the products derived from the plant. Exclusion of the indigenous Indians from access to the Neem is a clear example of IW perpetrated against their biodiversity. This supports the Information Science definition of IW coined in chapter two.

5.4.1.3 Australian biodiversity and the Aborigines

The Australian aboriginal culture is one of the oldest living cultural systems on the planet. Their unbroken cultural tradition extends back over thousands of years. Their physical environment was blessed with richness in food and medicine, fresh water, and few predators. The Aborigines of Australia had little need for material possessions. Instead of material culture they spent thousands of years developing their ideas and belief systems. The dreamtime myths are far more sophisticated and

complete in their comprehension of creation than those in the Western tradition such as the Old Testament or the Ancient Greek mythology. The Aborigines had a lucid understanding of the power and significance of the natural environment. Every plant in their environment was known, catalogued, and understood for its role in life. They had numerous ways to use natural plants for medicine (Thursdayplantation 2003).

Traditional Aborigines had numerous intelligent methods for using natural plants as medicine. One recognised method was using tea tree leaf for medicinal purposes to treat skin infections, burns, rashes, and so on. The simplest use of tea tree was to strip off a handful of the leaf, crush this in the hand, and inhale the scent. This is effective for congestion and chest infections. A compress of hot mud was made from ashes and would be placed over some crushed leaf and bound onto an infected wound as a healing plaster. As the Aborigines did not have metal they could not boil water by simply placing a pot on the fire, but a simple process of boiling water was to place red-hot rocks from the fire into a bark vessel filled with water. Branches of *Melaleuca* leaves could also be pulled off and used as whisks to flick across the body to repel mosquitoes. In addition to physically chasing mosquitoes away, the slight trace of oil that was left as a result of beating the leaf against the body acted as an effective repellent. A company named Thursday Plantation registered a patent for products derived from the tea tree with no benefit to the indigenous communities. The Aborigines had to purchase the products as a price they could not always afford. This constitutes a form of IW experienced by the Australian Aborigines against their indigenous resources.

5.4.2 Names

The unauthorised use of tribal names is one of the examples of violations of indigenous people's rights. An automobile manufacturer, for example, named one of its trucks "Cherokee". Also the use of words "Hopi", "Navajo", "Sioux" and "Zuni" have been incorporated into tradenames without permission from the tribes concerned. Table 5.1 depicts various tribal names that have been used as domain names mostly by the institutions of the developed world. Through various forums, the international community must advance the debate on the consequences of

globalisation in its various dimensions, including the unauthorised use of tribal names. It is the responsibility of the international community to debate the means of protecting and preserving the IK resources of indigenous communities. In this regard, it is necessary to recognise and respect the holders of indigenous resources. The misappropriation of names erodes the rights of the owners of the indigenous names (Azmi et al. 1997:144; Britz & Lipinski 2001:236-7; Posey & Dutfield 1996:44; Protecting Indigenous Knowledge 2002:2). Table 5.1 depicts a clear example of IW in which indigenous people can no longer officially use their own traditional names as Internet domain names because they have already been claimed by foreign organisations.

Figure 5.1 Indigenous names used as domain names

Name of indigenous people	Region in which the indigenous people are located	Domain name	Name holder	Country of domain name holder	Activity
Aborigines	Australia and Pacific Islands	aborigines.com	Noname.com	United States of America	General information/portal unrelated to Aborigines
Ashaninka	South America	ashaninka.com	Ashaninka Imports, Inc	United States of America	Web site of Ashaninka Imports
Ashanti South	Ghana	ashanti.com	Ashanti Farm	United States of America	Web site of Ashanti Farm
Apache	Southwest of America	apache.com	Apache Digital Corporation	United States of America	Web site of Apache Digital Corporation
Bribri	Central America	bribri.com	Kathleen LaBelle	United States of America	Web site on bookkeeping in the restaurant industry (BRI)
Chakma	South Asia	chakma.com	J. Rick	Republic of Korea	Server error
Cherokee	North America	cherokee.com	Iklkii	United States of America	Official site of the Cherokee Nation
Chorti	Central America	chorti.com	J. Rick	Republic of Korea	Server error
Dayak	Australia and Pacific Islands	dayak.com	Dayak	United States of America	Domain Name Registration Service (referring to Dayak servers)
Fulani	Africa	fulani.com	Fulani Consulting Limited	United Kingdom	Server error
Gaviao	South America	gaviao.com	Goldnames, Inc.	United States of America	gaviao.com offered for sale
Haida General	Pacific Coast of America	haida.com	Geoff Tobiasson	Canada	Information/portal unrelated to Haida
Inuit	Arctic	inuit.com	Inuit Gallery	Canada	Web site of Inuit Gallery of Vancouver
Lisu	Asia	lisu.com	Lisu Zavidny	United States of America	Site under construction
Maasai	East Africa	maasai.com	1st Digital, Inc	United States of America	Information on Maasai
Maori	Australia and Pacific Islands	maori.com	Show-off New Zealand	New Zealand	Web site of Maori.com
Nuer	Sudan	nuer.com	Nuer.com	Maldives	Server error
Onondaga	North America	onongada.com	SaltCity.com	United States of America	Server error

Name of indigenous people	Region in which the indigenous people are located	Domain name	Name holder	Country of domain name holder	Activity
Quichua	South America	quichua.com	EcuadorArts.com	United States of America	General information/portal unrelated to Quichua
Secoya	South America	secoya.com	Rob Vickery	United States of America	Site under construction
Somali	East Africa	somali.org	Compusite	United States of America	Site under construction
Tuareg..	Africa	tuareg.com	CC Net S.L	Spain	Server error
Yanomami	South America	yanomami.com	Mercedes Meier	United States of America	Server error
Yaqui	North America	yaqui.com	Jose Mayaudon	United States of America	Server error
Yucatec Eric	Central America	yucatec.com	Swindell	United States of America	Site under construction
Zhuang	Asia	zhuang.com	Palameta Gord	Canada	General information/portal unrelated to Zhuang

Source: Draft Standard RFC 2616, The World Wide Web Consortium (W3C), http://www.w3.org

5.4.3 Tourism

Tourism can benefit indigenous communities in terms of employment opportunities, infrastructural improvement and income from trade. Tourists are usually short-term visitors travelling in groups or individually to enjoy leisure activities like sightseeing, walking, sunbathing and skiing. Tourism can have a profound impact on indigenous cultures. The sale of handicrafts and art by tourists can be a useful source of income for many communities. However, sometimes the demand leads to mass production, a deterioration of quality, and the production of imitations by outsiders who may deceive tourists about their source. The tourism industry often results in the exploitation of indigenous people, abuse of their human rights and erosion of their culture. In most cases the local people do not receive income generated from goods and services sold to visitors. Tourism has become one of the biggest threats to indigenous groups (IUCN 1997:68; Posey & Dutfield 1996:6).

A core concern of indigenous people is the commercialisation of sacred aspects of their cultures for tourism. Consequently, much energy is being directed toward the restitution of indigenous sacred sites, as provided for by the universal right to religious freedom and Articles 12 and 13 of the UN Draft Declaration on the Rights of Indigenous Peoples. Sacred sites are integral to indigenous cultural survival, IK systems and indigenous concepts of sustainability (Johnston 2000:94). The following sections discuss various cases of IW related to tourism.

5.4.3.1 Toraja case

A typical example of tourism exploitation is that of the Toraja people of Sulawesi in Indonesia who became a tourist attraction because of their spectacular funeral ceremonies, burial cliffs and architecture. Complaints were made to the government that the Toraja communities were too commercialised. In response, the government organised a team of non-Torajan consultants to plan a zoning system. One of their proposals was to preserve the traditional houses and graves in some zones. This would require the permission of the people affected; however, this permission was never sought. Another proposal was to establish a tradition-free area where the Toraja would perform their rituals and dances of life and death in front of an audience of tourists, even though the mixing of such rituals is forbidden according to tradition. The consultants' inadequate knowledge of the Toraja culture sparked resentment and stirred up rivalry between sections of Toraja society. In 1987, several communities refused to accept tourists. Some reopened to continue trade in souvenirs. Cultural exploitation in this case was so deeply entrenched that it became irreversible, contributing to loss of local autonomy (IUCN 1997:68-9; Posey & Dutfield 1996:7).

The contact of the Toraja community with outsiders brought them into the global village where they became accustomed to the monetary economy which they had never had before. In addition, the consultants' inadequate information led to poor decision making which directly affect the Toraja people. The people could no longer access their private burial sites and ceremonies without the presence of prying tourists

or researchers. This proves the existence of a warfare that destabilised this community.

5.4.3.2 Jivaro dance case

Another visible example of how the ecotourism industry may violate indigenous people's IPRs is through the appropriation of cultural expressions and symbols. During the 1998 World Conference on Adventure Travel Association and Ecotourism in Ecuador, organised by the Adventure Travel Association (an American industry group), part of the welcoming performance included a staged Jivaro dance. Part of the performance included a highly derogatory, sensational, and out-of-context costume featuring spears bearing shrunken human heads. This type of entertainment is regularly provided to ecotourists for profit, and indigenous people can neither object nor demand fair compensation through the international IPR regulatory framework.

Similarly, there is no way for the community or family of the indigenous child whose face appears on thousands of postcards, teatowels, or other souvenirs, to track the proliferation of these retail goods, let alone collect a portion of the proceeds to pay for the photographed child's much-needed education and healthcare (Johnston 2000:94). No compensation is effected to the community or individual whose faces are used in postcards and other souvenirs. Typically, such individuals and communities are so poor that they cannot contest the use of their souvenirs without their consent or proper compensation. This example proves that a form of IW is being perpetrated against the local community whereby they are excluded from the sale of their own attributes and indigenous property.

5.4.3.3 Sacred sites and trade issues

Unauthorised visits to sacred sites are a common trend in ecotourism. Multilateral talks between countries that have sacred sites are on the agenda at various forums. The Symposium on Sacred Sites, Biological Diversity and Cultural Diversity was convened by UNESCO in Paris, France in September 1998. Following this, the World

Bank hosted a Cultural Site Management Workshop in Washington D.C. in April 1999. These third party analyses can be helpful in mapping out some of the issues relating to IK. However, they are framed within a paternalistic development paradigm and the solutions generated are usually far from the needs and management traditions of indigenous people. Moreover, indigenous organisations usually hear about these events only after they have occurred; or else, they are informed that no funds are available to assist them to attend the symposiums. An illustration of this is the meagre funding that was made available for indigenous people to attend the intergovernmental negotiations on biological diversity in Nairobi, Kenya, in May 2000, where safeguarding IK was a major topic of discussion (Johnston 2000:95).

Connected to the above concerns is the appetite of ecotourists for mass-produced versions of indigenous art. Textile, printings, songs and other expressions of culture are a vital way for indigenous people to document and pass on their traditional knowledge. A chain of culture loss occurs when indigenous artisans shift away from traditional methods and principles of design to meet market demands, for example, using bright colours or generic images (Johnston 2000:94).

Health, food, security, and cultural identity are all put at risk by inconsiderate tourism. Yet to the industry, sales of such inventions are a lucrative value-added component of tourism. These types of scenarios dominated the submissions made by indigenous people to the Round Table on Intellectual Property and Indigenous People hosted by the World Intellectual Property Organisation (WIPO) in Geneva, Switzerland in July 1998. However, it appears that the most significant response indigenous people will receive in the foreseeable future is a sympathetic ear. The Global Intellectual Property Division, established by WIPO (which represents 123 countries), has launched a formal inquiry into four thematic areas identified through discussion with indigenous people. However, the level of funding for this process and means of channelling allocated funds are unequal to the task. Accordingly, its emphasis is on formulating external expert groups as opposed to empowering indigenous people to take any leading role in analysis (Johnston 2000:94).

Tourism within developing communities has become an IK asset that attracts foreigners to visit locations that are usually close to the hearts of the locals. Tourism imposes an outside influence on the local community. It can thus be said to be a factor that proves that globalisation of the locals and their IK is often accompanied by the commercialisation of IK. This translates into psychological and economic IW perpetrated against indigenous communities.

In the Toraja case, the trade in souvenirs and the performance of rituals and the dances of life and death in front of an audience of tourists depicts the highly commercialised nature of the indigenous activities of that community. In the Jivaro dance case, the appropriation of cultural expressions and symbols for commercial purposes disadvantaged the indigenous communities as they did not get any form of compensation. The commercialisation and protection of sacred sites for tourism without the consent of the traditional owners also violates the rights of the indigenous people. These three cases prove the relevance of the Information Science definition of IW coined in chapter two.

5.5 Health-related issues

The world is in the midst of a global expansion in the extent to which pharmaceutical innovations are protected by the patent system. Previously, most developing countries treated pharmaceutical innovations as non-patentable, or at best offered only minimal protection for new manufacturing processes. Growing international condemnation of the excessive price of patented HIV/AIDS medicines finally forced trade ministers to address the thorny issue of global patent rules at the WTO Ministerial Conference held in Doha in November 2001. NGOs had campaigned vigorously on the issue, arguing that the global patent rules known as the TRIPS agreement would exacerbate the health crisis ravaging poor countries. By obliging all governments to grant minimum 20-year patents, TRIPS shields pharmaceutical companies from generic competition globally. This results in higher prices for vital new medicines in both rich and poor countries. Poor people's access to new medicines for treating diseases such as HIV/AIDS, and to newly improved

medicines for drug-resistant versions of old killers such as malaria and tuberculosis, has become limited (Lanjouw 2001:2; Mayne & Bailey 2002:5).

Developing countries cannot afford adequate supplies of expensive patented medicines, and unlike rich countries, most cannot even produce cheaper generic versions. Currently, they can buy imports of generic medicines from a handful of other developing countries that have not yet fully complied with TRIPS, such as India. Many important medicines are off-patent and can be produced and sold freely. TRIPS not only stops competitors producing and exporting cheap generic versions of patented drugs, its rules also stipulate that compulsory licences can only be granted predominantly to supply the domestic market. So although India, once fully compliant with TRIPS, could issue a compulsory licence to address its own health problems, it could not grant a licence in order to address the health problems of other countries, however desperate their needs (Mayne & Bailey 2002:6-7).

Each year the US Trade Representative identifies countries without adequate protection. For example, in 1989, Brazil, India, Mexico, China, Korea, Saudi Arabia, Taiwan and Thailand were placed on the Special 301 Priority Watch List. The resulting pressure was successful in convincing several countries to change their patent laws regarding pharmaceutical protection as part of larger reforms to their IPRs systems. Korea introduced protection in 1986, and Mexico passed new laws in 1991. Brazil showed greater reluctance to follow suit, so in October 1988, the United States levied 100% tariffs on imports from Brazil in retaliation for its copying of patented drugs. In the early 1990s Brazil rescinded and in 1996 passed legislation creating pharmaceutical product patents. The United States applied similar pressure to Thailand, withdrawing its trade benefits in 1990 because of dissatisfaction with its lack of protection for pharmaceuticals (Lanjouw & Cockburn 2001:268).

TRIPS requires inventors to avail themselves for protection in the rich countries or, alternatively, in the poor countries, but not in both, whenever a product is patented for a global disease. Because the profit potential offered by rich countries' markets is far greater, firms will naturally relinquish their hold in poor countries. Almost all

developing countries rely on imported medicines to a lesser or greater extent, and will therefore be affected by the restrictions to be placed by TRIPS on generic exports. Only a handful of developing countries, including Argentina, China, Korea, and Mexico, have innovative capabilities and can produce new drugs by a process of reverse engineering. Brazil has a limited innovative capacity. For the rest, most developing countries have either insufficient or no manufacturing capacity to produce new generic equivalents themselves. In developing countries, a large proportion of the population lives below the poverty line, and most medicines are paid for by individuals. Consequently, higher medicine prices resulting from TRIPS restrictions on the production and export of cheap generic medicines will have grave consequences for people's health (Lanjouw 2001:7; Mayne & Bailey 2002:8).

Major causes of death in Colombia are cardiovascular disease and cancer. The medicines to treat these diseases are relatively costly in relation to average incomes, so that even modest increases in price have major implications for families and government health budgets. The Colombian generics industry can produce low cost versions of many basic anti-infective drugs. In addition, the government has encouraged the importation of low-cost generic drugs, which has drastically reduced costs in a number of areas. The price of a patented version of insulin, for example, fell by half in the early 1990s. With the progressive implementation of TRIPS around the world, such sources of new generic medicines will gradually dry up (Mayne & Bailey 2002:9).

The US is trying to rescind on the commitment of Ministers at Doha to find an effective solution to TRIPS restrictions on production for export. Both the US and European Commission are under pressure from powerful corporate lobbies to restrict solutions to a small number of countries, to health emergencies, and to narrow definitions of manufacturing capacity, and to introduce cumbersome procedures that could effectively make such solutions unworkable. In March 2002, the WTO TRIPS Council initiated discussions on a follow-up to Doha. At the meeting the US tabled a paper rejecting the proposed solutions put forward by the European Commission and developing countries. Instead it proposed a moratorium on WTO disputes in cases where a government allows compulsory licences for export to selected developing

countries. The US proposal is unacceptable as it provides a temporary rather than a permanent solution. As a moratorium can be ended at any time, such a move will increase rather than reduce current uncertainty, and inhibit generic production (Mayne & Bailey 2002:10).

For many reasons the current situation provides a unique opportunity to examine the research and development stimulus provided by patents. First, although the developing world already shares diseases that are important in the developed countries, there remains a set of diseases whose sufferers are found almost exclusively in less-developed countries (LDCs). Second, certain drug therapies might be particularly relevant to LDCs in their tradeoff between cost and effectiveness or other characteristics, such as patents to encourage private investment in vaccine development. Finally, establishing the empirical facts is important because patent protection is a tradeoff. The profits generated create the incentives necessary for firms to make the investments in R&D which lead to new drugs and better health, but this occurs at the cost of higher prices to consumers. It is relatively straightforward to obtain information on drug prices. In India, for example, there have been many inflammatory articles about drug prices in the popular press, both because of the GATT negotiations and in response to changes in the price control system. It is far more difficult to measure the positive effect of patents on innovation (Lanjouw & Cockburn 2001:266).

With the expansion of 20-year patenting to all countries, the generic production of new medicines for domestic use and export risks became dependent on a complicated web of compulsory licensing and exceptions. This is likely to be a nightmare of legal administration for poor countries and generic firms (although highly lucrative for lawyers). Many poor governments do not have the legal and administrative capacity to implement TRIPS or use the safeguards adequately, and all are vulnerable to diplomatic and economic pressure, especially from the US (Mayne & Bailey 2002:15).

The developing world is in desperate need of medicine produced and patented in the developed world to save the lives of millions of their inhabitants. Information on the production of life-saving drugs cannot be made available to the developing world due to the TRIPS stipulations. Access to the medical products or their patents are additional obstacles faced by the developing world. Some countries within the developing world resort to reverse engineering activities as a desperate measure to save the situation. However, such actions are highly punishable according to the stipulations of international conventions.

5.6 First World benefits

As chapter four pointed out, if IK existed in its full right in the developed world, it would not be the subject of this thesis. The purpose of a discussion on the developed world here is to explore the implication that the appropriation of IK has benefited the developed world. This section also aims to show how much these countries would benefit from revenues from the developing world should the latter be interested in their patented inventions and research findings.

Countries who are bound to benefit from the harmonisation of IP laws are primarily those whose domestic economies and exports are tied to the servicing of the 'life sciences' and information economy. For instance, the largest US trade export item in 1996 was software and entertainment. Some developing countries, including China and India, have strong information capacities in certain areas but not others. Ideally, these countries would have preferred a stake in the international information market before having to accede to IP rules, but have been forced to do so under the terms of multilateral trade negotiations at the WTO conventions (Thomas 1999:220).

The domination of developed countries in the field of technology generation is evident from the 95 percent ownership of patents by the US. (See table 5.1 for the domain names that are registered using traditional names that originate predominantly in the US.) The strengthening and harmonisation of the IPRs regime will lead to a substantial increase in the flow of royalties and license fees from developing to developed countries. McCalman (in Kumur 2002:40) has quantified the impact of patent harmonisation and

finds that it has the capacity to generate large transfers of income between countries, with the US being the major beneficiary.

There is a growing reluctance on the part of some developed countries (notably France and Canada) to accede to pressure to liberalise cultural goods and services. At the WTO, Canada moved recently to negotiate for an international instrument by which countries would agree to treat cultural goods and services as significantly different from other products. This points to the growth of a larger awareness towards curbing free trade in the interest of national and cultural priorities (Thomas 1999:227).

Technology-rich nations, generally Western nations, have to encourage the transfer of technology to underdeveloped countries who are rich in biodiversity. Those people who discover the potential of plants, such as healing potential, are acknowledged as pioneers and held in high regard when they patent such discoveries. This excludes the indigenous populace from the harvesting and utilisation of their indigenous plant species. In terms of IK, the Internet has become a tool for communicating information about biodiversity (Greaves 1996:27; Viergever 1999:333; Semali & Kincheloe 1999:3).

In the eyes of the developed world, IK lacks legitimacy and is perceived as being outside of conventional scientific understanding. Many environmental scientists regard traditional knowledge as anecdotal, non-quantitative, out of date, and amethodological; others argue that it lacks scientific rigour and objectivity. Related to this point is the way that some holders of traditional knowledge view their own knowledge. For example, some local people may view their own knowledge as backward (Grenier 1998:49-53).

Chapter three stated that the Western perspective of IP is the most dominant view. IK is seen as unexplored territory. Tribal names are appropriated and registered as domain names without compensation for or recognition of the indigenous communities who own such names. This constitutes a serious form of IW that is perpetrated against indigenous communities and their resources.

5.7 Reasons for protecting indigenous knowledge

The various cases mentioned above provide good reasons for the protection of IK. Because IK is a form of IP, it is required for appropriation. Biopiracy is the most common threat to IK experienced by indigenous people. It is therefore important to further explore the reasons for protecting IK. It is logical that if corporations can secure IPR protection for their inventions, even those derived from the IK systems of indigenous people, then the indigenous people should also be entitled to IPR protection. The more indigenous artefacts are used in commercial or entertainment settings, the greater the danger of exploitation through commoditisation or misrepresentation (Britz & Lipinski 2001:238).

IK has the potential to be translated into commercial benefits by providing valuable leads for the development of useful products and processes. The unauthorised commercialisation of the knowledge, seeds and plants of traditional communities, and the extraction of their own biogenetic material without their informed consent, undermines indigenous peoples. Due to the globalisation of production systems, the increase in population, and the destruction of forests for agriculture and timber purposes, biodiversity is declining at a rapid pace. Biodiversity and associated IK are also declining due to decreased motivation amongst the local communities to conserve and protect them. This is happening because of changes in traditional lifestyles as well as the misappropriation of the resources and knowledge of local communities. The misappropriation of IK does not only violate the rights of the communities who conserved IK, but also adversely affects the conservation and sustainable use of both the IK and biodiversity (Mulenkei 1998:125; Posey & Dutfield 1996:44; Protecting Indigenous Knowledge 2002:2).

On the other hand, public disclosure and the use of secret knowledge, images and other sensitive information are often perpetrated by tourists (as highlighted in this chapter) and by some researchers (discussed in chapter four). Filming and taking photographs without permission also undermines indigenous communities. Video

images of indigenous people are sometimes used for commercial purposes, especially advertising by multinational companies. Advertising and tourism promotion literature aimed at attracting foreign tourists to a country sometimes feature indigenous people. Guatemala, for instance, used photographs of Mayan people and their art to attract tourists in spite of the fact that these people have suffered brutal repression for many years at the hands of the Guatemalan governments (Posey & Dutfield 1996:44).

In order to prevent the violation of IK, it is imperative that indigenous resources be protected. The national biodiversity conservation regimes must comply with the objectives of the Convention on Biological Diversity. These regimes may provide legal protection for biological resources and associated IK at the national level. The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore is in the process of working on issues relating to contractual practices, IK databases and the preparation of a document containing elements for a possible *sui generis* system for the protection of IK (Mulenkei 1998:126; Protecting Indigenous Knowledge 2002:3).

5.8 Summary

Indigenous communities are very dependent on IK resources for their survival. Kinds of IW facing IK resources, such as biodiversity, names and tourism, were discussed. Health-related issues and some of the First World benefits from IK appropriation were also discussed. On the other hand, more indigenous artefacts are sold commercially. The commercialisation of indigenous seeds and plants is a serious threat to the existence of indigenous communities. Globalisation has increased the number of people who are interested in IK and more incidences of IK appropriation have consequently occurred as highlighted by the case studies. The misappropriation of IK does not only violate the rights of communities but also affects the conservation of sacred artefacts in these communities. All these examples clearly illustrate that a concerted IW effort has been perpetrated against the developing world. In cases where IK is protected by IP, indigenous communities are no longer at liberty to exploit their

resources as they used to. Although newly patented products are made available to them, this is at a price that few can afford.

This chapter investigated various cases that prove that a form of IW is perpetrated against IK. Case studies illustrating biodiversity appropriation issues, indigenous names appropriation and tourism proved the existence of IW against IK. In an attempt to answer the research problem statement, this chapter answered the following research sub-question:

What is the current state of IW against IP?

It is necessary to determine what current measures are employed to promote and protect IK. Chapter six will therefore investigate various measures employed to promote and protect IK.

Chapter 6

Current measures employed to protect IK

6.1 Introduction

The previous chapter proved that IW is perpetrated against IK by investigating various cases in which evidence of IK appropriation could be found. Various measures are currently employed to protect IK and which are implemented in conjunction with the *sui generis* IP laws. It is imperative to investigate measures that are currently employed to promote and protect IK. In an attempt to answer the main research problem statement, this chapter answers the following research sub-question:

Which measures are currently used to protect and promote IK?

The measures investigated in this chapter include mechanisms through which indigenous people can be compensated for their appropriated IK. Such mechanisms depend on the recognition of the relevant indigenous groups as being the appropriate owners of the IK in question.

6.2 Recognition of IK and indigenous people

It is important to recognise the values of IK and the resource management abilities of indigenous people in order to promote sustainable development. This should assist such communities in recording and documenting their own knowledge, including their oral tradition. An interdisciplinary approach that integrates social and biological or natural scientists with indigenous specialists is required. IK cannot be fully understood when analysed independently of the social and political structure in which it is embedded (IUCN 1997:88-9).

A product patent cannot be obtained for a naturally occurring organism or gene that has not been isolated. This rules out the patenting of useful IK relating to naturally occurring organisms. Some traditional medicinal or preparations made from natural substances could be regarded as patentable modifications or combinations and thus process patents may be obtained for them. Indigenous people may be able to patent a certain amount of their knowledge but one major obstacle to this is that the process of acquiring a patent, which includes payment for filing, the examination, and the grant, is expensive and time-consuming. Community control over access to IK is seen as a basic right and is supported by international governments and conventions such as the Convention on Biological Diversity. Several mechanisms for securing community control over IK are the following (IUCN 1997:91-2; Posey & Dutfield 1996:37):

- establishing national IK resource centres to coordinate the exploration and use of IK for sustainable development in partnership with indigenous organisations and communities
- creating a network with appropriate protocols that would link national indigenous resource centres and indigenous organisations. The network should also regulate the transfer of technology and knowledge
- recognising IK holders as equal research partners
- using IPRs where appropriate
- encouraging ethnobiologists, university-based organic chemists and pharmacologists to act as neutral brokers in relations with pharmaceutical companies
- linking the marketing products derived from indigenous resources directly with indigenous harvests to increase both the indigenous share in the market and the benefit to local communities
- sharing income arising from the use of IK
- labeling sources of products and packages.

It does not seem possible to stop the international interest in IK. Rather, the above measures would help ensure that indigenous people are included in the process of the commercialisation of IK . A more realistic approach to this problem would be for

indigenous people to learn to live with and manage this process. This begins with recognising the role of indigenous people in this regard. To begin with, an inventory of national IK resources is needed. The most efficient way of establishing such an inventory is to start by documenting IK resources. In light of this, issues related to the documentation of IK are discussed in the following section.

6.3 Documenting IK

Indigenous communities are becoming increasingly aware of the many benefits of documenting IK. Some indigenous communities have established databases which they maintain themselves. This strengthens their ability to control access to and use of their indigenous and related knowledge (IUCN 1997:117-8). Conversely, there are some institutions that maintain websites containing IK information which were not established in consultation with the indigenous communities who provided such information.

Community registers have been developed in countries such as India as a means of securing community control over traditional ecological knowledge. Locals document all known plant and animal species with full details of their uses. Community members are then in position to refuse access to the register. They usually set conditions under which others would be allowed access. Sacred sites and secret information are not made part of the common register. Some registers are freely available to communities. This is intended to make the patenting of indigenous knowledge by others more difficult as by reading the register, community members will become more vigilant. Contracts are the most accessible and easily instituted legal instruments that can assist in the protection of IK. Registers can be quickly drawn up and they require little legal expertise to implement. They can guarantee upfront payments, training, technology transfer, royalties and other financial and non-monetary forms of benefit sharing (IUCN 1997:118-9&140). Proposed compensation mechanisms are discussed further on in this chapter.

Documentation of IK is one means of giving recognition to knowledge holders. However, merely documenting IK does not necessarily imply that the benefits arising from its use will be shared, unless it is backed by some kind of mechanism for protecting the knowledge. Documentation of traditional knowledge may serve only a defensive purpose, namely, preventing the patenting of this knowledge in the form in which it exists (Protecting Indigenous Knowledge 2002:5; Viergever 1999:338).

It is quite clear that existing IP protection regimes do not adequately recognise the rights of IK holders. National level mechanisms and legal provisions are required both to prevent biopiracy and to install informed consent mechanisms to recompense IK holders. However, these mechanisms will only be effective if they are recognised internationally and enforced in other countries. In this regard, there is a need for the development of an international mechanism for protecting IK. Such an international mechanism should include local protection of the rights of IK holders through national level *sui generis* regimes, including customary laws (Mulenkei 1998:126; Protecting Indigenous Knowledge 2002:6).

During the process of documenting IK, it is important to discuss cooperation between bioprospecting researchers and the holders of IK. The researchers' contact with IK, as discussed in chapter four, should be enhanced by meaningfully involving the locals in their research endeavours. Joint ventures and collaborative research are the most practical ways of involving locals when conducting IK-related research.

6.4 Joint ventures and collaborative research

Joint management of IK in this context implies a certain relationship between government, indigenous communities and parties interested in IK. Such relationships may vary from government retention of key management functions through various forms of partnership to full indigenous control. Indigenous people must have a stake in the management of local resources on which their subsistence economy is based. Cooperative or co-management arrangements in which indigenous communities share management authority with other government organs represent an incremental step

towards self-determination. Such benefits should entail aspects such as joint research and information sharing systems (IUCN 1997:132-3; Mulenkei 1998:126).

Collaborative research is undertaken between two equal parties based on agreed objectives and methods. Conditions necessary for collaborative research may depend on the ability of an indigenous group to regulate access to their lands. For indigenous people to participate in collaborative research, the process needs to be cross-cultural, multilingual, and geared to free exchange of information and viewpoints. The terms of the collaboration should be negotiated, and activities of the researchers working within indigenous people's territories must be controlled. Models of collaboration between indigenous and non-indigenous experts and scientists for collecting, processing and applying IK are varied and must be adapted to local situations (IUCN 1997:141-2).

Indigenous people need to be recognised and compensated for the role played or contributions made during research. There are various ways in which indigenous people could be compensated for their research contribution. These may include monetary and non-monetary compensation. Such compensation mechanisms are discussed in the following section.

6.5 Possible compensation mechanisms

Compensation is expected to vary depending on a number of factors. For example, in the pharmaceutical industry, if knowledge and resources are contributed during the early stages of the research only, compensation in the form of royalties will be quite low. If the knowledge and resources identify an actual product, royalties may be higher. It should always be determined whether the form of compensation reflects the community's needs and desires or the researchers' perception of the situation. Money may not always be the most suitable form of compensation (Posey & Dutfield 1996:37-38).

The question of whether compensation is merited on moral grounds alone depends on the individual country's national laws. Compensation of source communities for knowledge and biogenetic resources is problematic and will invariably differ from case to case, not only in quantity but also in type of compensation. A number of compensation mechanisms, such as funds, contracts, IPR agreements, nonbinding agreements, and defensive publications are used as compensation. Defensive publications are used for compensation, benefit sharing, and the protection of IPR. The same mechanisms can be applied to IK (Grenier 1998:23; Posey & Dutfield 1996:37).

6.5.1 Funds

Companies can establish funds to compensate communities for appropriated IK that is no longer widely available. Such IK might be unattainable because the original innovators are anonymous or no longer living. This type of mechanism can support a wide variety of regional goals, such as biodiversity-conservation programmes (Grenier 1998:24).

6.5.2 Contracts and IPR agreements

Contracts are legally binding agreements between two or more parties that enable the contractees to take legal action on their own behalf. This may be appropriate if knowledge and resources are not widely known and are not in the public domain. A community's contract with a company may give the community (among other things) rights, local training, royalties on compounds, or the option of filing a joint patent with the company or having local community members named as inventors. Contracts can address issues of confidentiality and exclusivity. A confidentiality clause can ensure that the knowledge or material will not be made available to anyone else without the community's permission. The company may request exclusive rights to the information or material supplied (Grenier 1998:24).

Material transfer agreements (MTAs) establish standards for the transfer of biological resources and outline the benefits to the supplier (for example, upfront benefits, a trust

fund, or future royalties). When the material has commercial potential, MTAs usually grant the commercial party the right to apply for patents. Information transfer agreements (ITAs) move one step beyond MTAs. ITAs give communities the right to be compensated for material transfer and also the right to be recognised for their intellectual contribution by having community members named as inventors in the patent application, or by being able to file a joint patent with the company. Licensing agreements enable a community to sell a patent to a company that is better equipped to market a product. Under a licensing agreement, a company pays fees to the community for knowledge (or samples); and the community transfers this particular knowledge to no other party besides the company during the period that the licensing agreement is in effect (Grenier 1998:24; Posey & Dutfield 1996:68-9).

6.5.3 Non-binding agreement

A letter of intent or a memorandum of understanding is a statement of principles between parties that serves as a framework for a future legally binding contract. A letter of intent or a memorandum of understanding can address issues of confidentiality, the sharing of research results, and the provision of benefit, but is not legally enforceable. Covenants establish principles for future legally binding agreements and often contain ethical commitments (Grenier 1998:25).

6.5.4 Defensive publications

Inventors may publish a thorough description of their invention containing information on how to use it. After the date of publication, any patent claim for the same invention will be invalid. The quality and form of compensation for IK are complex issues. Competition should depend on how closely the commercial product is related to the traditional compound or use. If a community contributes knowledge and resources during the early stages of research only, royalties can be as low as one to five percent. If the commercial product is based on an indigenous product, royalties can be as high as 10 – 15 percent. The details of such arrangement are negotiated on a case-by-case basis (Grenier 1998:25).

Compensation mechanisms do not preclude the protection of IK. It does not mean that if indigenous people were rewarded for their knowledge, IK could be left at the mercy of prospecting researchers. IK should be protected and compensation could be administered on a case-specific basis. The following section addresses the need for additional mechanisms by which IK could be protected.

Effective measures are needed to protect IK. The cases discussed in the previous chapter show that serious IK appropriation has taken place. Protection against such appropriation is scarce, since current international IP regimes and conventions were not designed with IK in mind. The following section investigates the necessity of designing appropriate IK protection systems.

6.6 Systems for IK protection

It has become apparent that piracy in the form of IK appropriation is being perpetrated on the part of certain Northern corporations against Southern communities. The cases mentioned in the previous chapter bear testimony to this piracy. The lack of legal frameworks for the protection of IK has made indigenous communities of the developing world vulnerable to biopiracy. More generally, biopiracy is one way for some rich countries to extract wealth from poorer countries (Martin 1995:9; Shiva 1996:10).

WIPO agreements appear to allow the retention of an indigenous system, but this is not a real alternative. In defending trade-related actions, the systems recognised by international conventions have the legal benefit of the doubt whilst the indigenous system must prove itself. However, developing countries do not always have resources to prove themselves (Finger & Schuler 2000:522).

The attempts made by the Convention on Biodiversity to outline some measures to protect IK were not sufficient. The convention promotes the idea of biodiversity as a global common heritage which, therefore, requires biodiversity-rich countries to allow other countries access to biological resources on mutually agreed terms. It requires

technology-rich nations (generally developed nations) to encourage the transfer of technology to biodiversity-rich, developing countries. Thus, the Convention promotes the exchange of biological resources for technology to facilitate bioprospecting, which benefits all nations in the world. This clearly spells out a need for an inclusive system of IP regimes to protect IK (Bhat 1999; Thrupp 2000:280).

In the Uruguay Round, IPR was linked for the first time with international trade to become what is known as Trade Related Aspects of Intellectual Property (TRIPS). Some TRIPS provisions differ dramatically from some of the patent regulations which prevail in the developing countries. TRIPS provisions restrict the way farmers and the local people have traditionally utilised biological resources and their derivatives (McCalman 2001:161).

The international environment has changed considerably with respect to IP with the conclusion of the TRIPS agreement. The TRIPS accommodates the demands of the industrialised countries for higher international standards of protection by mandating the extension of patentability to virtually all fields of technology recognised in developed countries' patent systems. This could prolong patent protection for a uniform term of twenty years, and provide legal recognition of the patentee's exclusive rights to import the patented products (Kumar 2002:37).

TRIPS is not a product of negotiations. It was imposed by transnational corporations on the citizens of the world. These corporations achieved this by manipulating the governments of industrialised countries into consensus. TRIPS is not a result of democratic negotiations between the larger public and commercial interests or between industrialised countries and the Third World. TRIPS is weighted in favour of transnational corporations against Third World countries. TRIPS recognises IPRs as private rights which lead to a corporate monopoly. The other limitation of TRIPS is that it recognises IPRs when knowledge and innovation generate profits, but not when they meet social needs. However, it seems fair that ideas produced in rich countries be provided to poor countries at no cost (Martin 1995:9; Shiva 1996:18-19).

It is a costly process to determine the genetic and biochemical information contained in biotic material, and to further generate information on how to apply basic knowledge to produce and develop useful products. However, once this is generated and incorporated in new products or technologies, the copying or emulation of the new product or process is relatively cheap, such that the access to the new information is almost free. Because of this, producers of information or knowledge have difficulty capturing at least some of the social value of their creative activity, and hence difficulty in meeting the costs of producing innovations (Finger & Schuler 2000:512; Janssen 1999:318).

The Western patent system is inappropriate for the subject of biodiversity or living resources. The shift from the chemical era to the age of biology creates new problems of patentability. Patents on biodiversity falsely claim that properties of plant-derived drugs are 'products of the mind' when they are actually products of plant biodiversity. Plant-based medicines depend on existing properties and characteristics of diverse plants. The boundary between the 'product of nature' and the 'product of mind' is therefore blurred in the case of plant medicines. Medicinal plants in indigenous systems of knowledge are the basis of most patent claims by Western enterprise (Shiva 1996:23).

Instead of recognising the innovation of traditional systems, recognition and protection under Western-style patent regimes are given to minor modifications of IK systems by practitioners of Western science. Thus, patents cannot offer protection to the intellectual heritage of practitioners of indigenous medical traditions. Traditional knowledge relating to biodiversity is not patentable by indigenous practitioners since the criteria of patentability are novelty, non-obviousness and industrial application. Knowledge pluralities have been transformed into knowledge hierarchies as a result of colonial biases which have treated Western knowledge as exclusively scientific and non-Western knowledge systems as unscientific. A pluralistic IPR regime needs to be evolved which makes it possible to recognise and respect IK systems, practices and livelihoods (Shiva 1996:23-5).

If no property rights are accorded to IK, then for many companies, such information will remain a free input for production. Most IK is said to fall outside the scope offered by standard IP regimes. The creation of *sui genris* regimes was proposed as suitable for the developing world. A possible *sui generis* strategy for the developing world is that each developing country should legislate for a *sui genris* form of protection for IK within its borders. The *sui generis* system should later be linked to the national statutory regimes of developing countries that are participating in the process. Once a significant number of developing countries agreed to participate in such an agreement, it is likely that the Western world would also join (Drahos 1997:209-211). This arrangement is unjust to the developing world because IK is sidelined and removed from the international platform of protection.

IP cannot alone sufficiently protect IK. All IK resources need to be documented, digitised and stored in national repositories. Any registration of a patent or an invention based on an IK resource could be verified against this repository and further actions could then be taken against any infringement. There is a need for an additional system to protect IK and also improve access to it. An internationally agreed upon system that recognises national level IK protection should also be designed. Such an instrument would not only help to prevent biopiracy but would also ensure that national level benefit-sharing mechanisms and laws are respected worldwide. However, the efforts to develop such a system should not lead to the harmonisation of national level *sui generis* systems but should rather recognise the diversity in national level systems and provide for international recognition of this diversity. There is a dire need for another system to protect IK in addition to the existing IP regimes.

6.7 Summary

This chapter investigated some of the measures that are currently employed to promote and protect IK. It was proposed that some *sui generis* IP laws be employed together with various measures to promote and protect IK. Various measures currently employed to promote and protect IK include documenting IK resources, joint ventures and collaborative research, as well as various financial compensation measures. In an

attempt to answer the main research problem statement, this chapter answered the following research sub-question:

Which measures are currently used to protect and promote IK?

It was further discovered that these measures do not adequately promote and protect IK and that an additional system is required to protect and promote IK. Chapter seven investigates the use of information and communication technologies as additional mechanisms to promote and protect IK.