

5.1 Introduction

Over hundreds of thousands of years, indigenous people have developed a close and unique connection with the environments in which they live. They have also established distinct systems of knowledge, innovation and practices relating to the uses and management of biological diversity.

Much of this knowledge contributes extensively to research and development, particularly in areas such as pharmaceuticals, and agricultural and cosmetic products. These jungle-dwelling societies might know botanical remedies for diseases that currently baffle modern science. This theory is the basis for a multi-million dollar business effort to patent new medicines from ancient herbal remedies. A pertinent example of this, is one of today's most potent medicines for treating childhood leukemia, which was derived from the rosy periwinkle, an old standby of witch doctors in Madagascar.

In the context of these uses, indigenous peoples claim that their rights as traditional holders and custodians of this knowledge are not adequately recognized or protected by legal measures. They demand not only for recognition and protection of this knowledge, but also for 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.

5.2 The importance of indigenous medicine

Indigenous medicine has for centuries been the mainstay of the health care system in non-Western communities, and its continuous utilization must be taken seriously. One area in which indigenous medicine has not developed in the same way as Western medicine, is in the construction of precision methodologies for testing its effectiveness. Often those trained in Western medicine, have taken this to mean that indigenous medicine is not effective. But the apparent absence of Western-type methods for testing the efficacy of indigenous medicine should not be seen as evidence of its ineffectiveness. Examples include aspirin, quinine and cancer chemotherapy agents (e.g. taxanes) amongst others, which are all synthetic equivalents of old folk medicines.

Moreover, African and other indigenous societies have a system for measuring efficacy of their medicine within a social context. This is reflected in the fact that the community refers patients with particular ailments to a specific traditional healer. Such collective behaviour is indicative of the community's recognition of the effectiveness of that particular "medicine man" and his medicine.

Traditional knowledge related to human health, is currently the basis of primary health care for a large part of the world's population. Interest in this area is more and more recognized in development policies, the media and scientific literature. In Africa, traditional healers and remedies made from plants play an important role in the health care of millions of people. Local communities have always used and managed natural biodiversity resources to meet their needs in health care.

Ratios of traditional practitioners and medical doctors to total populations in African countries are telling. In Ghana's Kwahu district, there is one traditional healer for every 224 people but only one university trained medical doctor for almost 21 000 residents (ELCI, 1996).

The same applies to Swaziland, where the ratios are for every traditional healer there are 110 people while for every medical doctor, there are 10 000 people (ELCI, 1996).

Relegated for a long time to a marginal place in health planning of developing countries, traditional medicine or more appropriately, traditional systems of health care, have undergone a major revival in the last twenty years. Also, the international pharmaceutical industry has started developing a keen interest in medicinal plants. The sales of the phyto-medicine industry have already exceeded \$ 2 billion in the United States in 1996 (ELCI, 1996). We are thus currently at a stage where traditional medicine is considered more for its capacity to generate other medicine and financial earnings, than for its own sake.

5.3 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.¹ Increasingly sophisticated biotechnological processes are used to transform plant derived substances into commercially successful products with global markets.

There is currently an increased interest in natural remedies. Hence, pharmaceutical companies are keen to use traditional knowledge.

¹ World Resources Institute (<http://www.igc.org/wri/biodiv/bp-facts.html>)

It has been estimated that 25% of prescription drugs (about 7000) in the United States, have active ingredients which are extracted or derived from plants (Puri, 2000:1).

In the chemical field, extracts from particular plants have been used as a natural insecticide by environmentally friendly pest controllers. A Brazilian fungus has been patented as a natural fire ant control and genetically modified organism – the potential seems unlimited.

The patenting of products and substances derived from the natural environment has particular implications for indigenous peoples' claims.

5.4 Patent protection and its limitations in protecting indigenous knowledge

A patent is an important component of intellectual property 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) (Lipinski and Britz, 2001:22).

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. 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.

5.5 Case studies of global commercial exploitation of indigenous medicinal knowledge

5.5.1 India

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, fertilizers, and in agriculture. 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" (Davis, 1998:4).

The neem has unique characteristics as a bio-insecticide in that it is lethal to at least 200 types of insects as well as species of mites and nematodes, but completely harmless to birds, mammals and even beneficial to insects such as bees (Puri, 2000:27).

From the early 1970's, the neem tree began to attract the attention of the United States and global markets. In 1971, a US importer noted the properties of the neem tree, and began importing it (Puri, 2000:27).

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 transitional chemical company W.R. Grace & Co (Davis, 1998:4). W.R. Grace's patent described it as a "strong, stable azadirachtin formulation used as a pesticide" (Puri, 2000:27).

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.²

5.5.2 Australia

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 (Davis, 1998:5).

² The critics state that: "Patent claims on the various processes and products of the neem that re built on the vast and intellectual heritage of the Indian people, reflect a total devaluation of the country's intellectual heritage and an arrogance on the assumption of superiority of western sciences" (Davis, 1998:5).

During the 1960's, 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 1980's, 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 (Davis, 1998:5).

To develop this substance, in the early 1990's, the Western Australian 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 Western Australian Government would receive royalties exceeding \$ 100 million by the year 2002 if *Conocurvone* is successfully commercialised (Davis, 1998:5).

Given these commercial values on smokebush and its derivatives, critics argue that there should be provisions for Aboriginal peoples to share in benefits from this plant, given their role as first having identified the smokebush for its therapeutic and healing properties.

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 of 1984. This Act was amended in 1993 to include a clause specifically designated 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, favoring instead, state and industry interests (Davis, 1998:5).

Amrad Pharmaceuticals has recently also signed an agreement with the Aboriginal Tiwi Land Council to enable it to conduct research with rare Northern Territory plants with the assistance of Tiwi Aborigines (Puri, 2000).

5.5.3 Cameroon

The bark of *Prunus africana* has been found to have important anti-cancer properties. It is also used in the treatment of benign prostatic hypertrophy (BPH). The bark of this tree is currently being debarked illegally, causing many trees to die and threatening extinction of the species (Bodeker, 2000:1).

A French company is the sole holder of a commercial exploitation permit to collect and export the bark to the European market. The European market was estimated at \$ 150 million in 1992 (Bodeker, 2000:1). None of these profits are repatriated to Cameroon, whose citizens are paid only for the collection of the bark.³

5.5.4 South Africa

In South Africa, as elsewhere in Africa, there is not only a need to promote the use of indigenous knowledge, but there is also a serious need to protect it from exploitation and possible extinction.

³ Cameroon intellectual property laws protect patents (including pharmaceutical patents and “cultural patrimony”, e.g. indigenous medicinal treatments. However, protection would be limited only to Cameroon. New inventions, based on minor variations on traditional knowledge would be eligible for patent protection in industrialized countries (Bodeker, 2000:1). Cameroon has made no attempt to

This is specifically applicable to indigenous medical knowledge. South Africa is the third most biologically diverse country in the world, with more than 30 000 plant species - 80% of these species are endemic to the region. Many of these species are used by traditional healers (of whom there are more than 200 000 in South Africa) as medicine. However, two problems arise. The one is that 15% of these species are under serious threat of extinction (Jordaan & Britz, 1999:4).

The second is that of bio-piracy. It is estimated that over a dozen Japanese, European and American pharmaceutical companies obtain their raw material from Africa, and treat the host countries as global warehouses to be exploited by paying them extremely low prices for the plant species that are used (Dutton & Dutton, 1997:1). The problem is that there is current up to date legal protection in terms of intellectual property in South Africa for indigenous knowledge.

Once a local community gives away its indigenous medical knowledge it has lost control of the valuable resource. Two examples of these practices are the following:

5.5.4.1 Rooibos tea (*Aspalathus linearis*), rooibostee, bossietee (Afrikaans)

Southern Africa has a diverse and interesting indigenous tea culture. Several teas are known, but the distinction between a tea, a tonic tea and a medicinal tea (i.e. a medicinal infusion) is somewhat blurred. Some examples of these are the following: in some parts of the Karoo, lidjietee (made from *Viscum capense*) is still in daily use as a tonic.

develop its own capacity to prepare medicinal plant extracts for sale on the world market, nor to link this trade to conservation and local community development.

The same is true for devil's claw (*Harpagophytum procumbens*) in the Kalahari region and in Namibia. Honeybush tea (*Cyclopia* species) is another well-known indigenous tea which is also widely used.

Rooibos tea is one of the best known indigenous medicinal teas, and have become increasingly popular as a health beverage, because it is totally devoid of caffeine but rich in phenolic compounds which is nowadays claimed to have important anti-oxidant activity. This plant is a shrub of up to two metres high, with bright green needle-shaped leaves that turn reddish-brown after processing. The small, yellow flowers are produced in early summer, followed by small single-seeded pods.



Rooibos tea is a traditional beverage of the Khoi-descended people of the Cedarberg region in the Cape and is one of only a few indigenous plants that have become an important commercial crop. Production is still centred in its natural distribution area (the districts of Nieuwoudtville, Clanwilliam, Citrusdal and Piquetberg). Seeds have to be treated with sulphuric acid to break the impermeable seed coat and seedlings are transplanted to deep acid sandy soils.

The production area has cold wet winters and hot dry summers, with a mere 300 to 350 millimetres of rain per year. Some wild types of rooibos tea are harvested on a small scale, but only one form, the so-called red type or Rocklands type, is commercially cultivated.

Annual yields vary from about four to nine million kilograms, depending on the rainfall. The plants are mostly harvested with sickles and tied into bundles. They are then chopped into short segments, moistened, bruised and left in heaps to “sweat” or “ferment” for several hours until a sweet smell develops.

So-called “fermentation” is actually an oxidation process, during which the phenolic compounds in the plant are enzymatically oxidized. When the tea-maker is satisfied with the colour and aroma, the tea is spread out thinly to sun-dry (Refer to Annexure 2 for the rooibos tea production cycle).



According to van Wyk & Gericke (2000:100), marketing started in 1904, through the efforts of Benjamin Ginsberg, who bought wild tea from local people. During the early 1930's, Dr. P. le Fras Nortier helped to develop rooibos tea as a crop plant and Mr. James van Putten played a major role in later years. The Rooibos Tea Control Board was established in 1954 to stabilize producer prices through structured marketing and quality control. This Board was recently turned into a private company. Through imaginative marketing, rooibos tea has become an important commercial product, with retail and export earnings running into many millions of rands per year.

However, the Khoi people and original holders of the knowledge who have traditionally used rooibos for its therapeutic and healing properties, would receive nothing from the commercial exploitation of the plant.

Rooibos tea is popular as a health beverage, prepared and used in much the same way as black tea. However, it contains no harmful stimulants and is totally devoid of caffeine. It has gained popularity as an excellent iced tea. The health properties are ascribed mainly to the low tannin content, the presence of minerals and the antispasmodic and free-radical capturing properties of several unique flavonoid C-glycosides such as aspalathin and nothofagin. The product is also used as an ingredient in cosmetics, in slimming products, as a flavoring agent in baking, cooking, cocktails and even as a milk substitute for infants who are prone to colic.

5.5.4.2 Devil's claw (*Harpagophytum procumbens*) sengaparile (Twana), duiwelsklou, kloudoring (Afrikaans)



The Devil's claw is a perennial plant with annual stems spreading from a central tap root. The common names are derived from the claw-like fruit



The thick, fleshy secondary roots are the parts used medicinally. The plant is traded world-wide, and it has a reputation for efficacy in osteoarthritis, fibrositis and rheumatism and is particularly effective in small joint disease.

According to van Wyk & Gericke (2000:146), devil's claw is taken as a bitter tonic to stimulate the appetite and for indigestion. Taken in the form of infusions and decoctions, tinctures and extracts, it is used in many health conditions, including diabetes, hypertension, gout and peptic ulcers. It is taken for fever, and as an important tonic in infectious diseases including tuberculosis. Taken on a regular daily basis, it has a subtle laxative effect. Small doses are used for menstrual cramps, and in higher doses to assist in expelling a retained placenta. It is also used post-partum as an analgesic, and to keep the uterus contracted.

The dry, powdered tuber is used directly as a wound dressing, or it is mixed with animal fat or vaseline to make wound healing and burn-healing ointments. Commercial ointments and creams are applied topically for minor muscular aches and pains and to painful joints. In Germany, it is used in supportive therapy for degenerative disorders of the locomotor system and for lack of appetite and dyspeptic problems.

The iridoids harpagoside, harpagide and procumbide have analgesic and anti-inflammatory activity, and, together with phytosterols, such as β -sitosterol, may be responsible for some of the efficacy of devil's claw. Clinical studies support its use in painful joint conditions (Lecomte & Costa, 1992) and low backache (Chrubasik, 1996). Serum cholesterol and uric acid levels were also found to be reduced (Brady et al, 1981).

Devil's claw has become a medicinal plant of international importance, with approximately 500 tons being traded annually, almost solely from wild-harvested material. With the increasing interest in the therapeutic potential of this plant, there is a danger of over-exploitation of wild resources. Furthermore, the original custodians of the indigenous medicinal knowledge who have traditionally used Devil's claw for its therapeutic and healing properties, are not shareholders in the commercial success of the plant.

A number of private initiatives in Namibia and South Africa are successfully propagating the plant on a limited commercial scale in the interests of providing a sustainable supply of raw material, and also to control the quality of the raw material.⁴

It is obvious from the above examples of bioprospecting and patenting of biological and genetic products that important issues are raised 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.

⁴ The Agricultural Research Council of South Africa is investigating the feasibility of transferring propagation technologies to the small rural farmer in the interest of rural development.



5.6 Conclusion

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 remain unacknowledged, and little or no financial benefits are returned to these knowledge holders and innovators for their contribution.

While conventional intellectual property rights systems are largely ineffective in providing recognition and protection for indigenous knowledge, there are some other avenues that have potential to offer solutions. In the next chapter, some solutions of these problems will be discussed, e.g. alternatives to intellectual property systems that may offer more productive opportunities for the protection and promotion of indigenous knowledge.

CHAPTER 6 CRITICAL EVALUATION AND POSSIBLE HARMONIZATION OF PROBLEMS ASSOCIATED WITH CURRENT LAWS AND PROPOSED SOLUTIONS

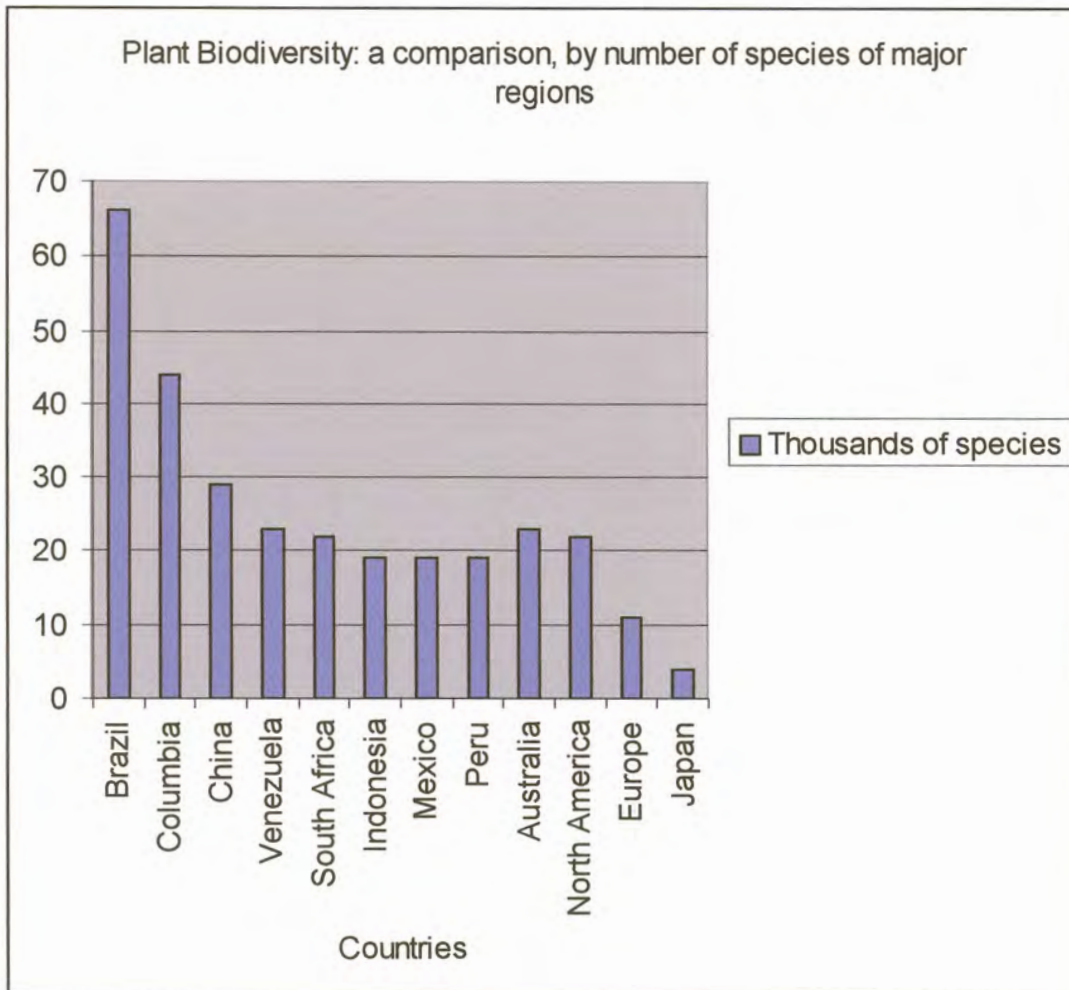
6.1 Introduction

Expressions of indigenous culture of underdeveloped countries or of underdeveloped peoples within developed or developing nations is a sought after commodity in today's globalized marketplace. Since indigenous knowledge is often found in intangible form, the legal protection may be minimal. When the knowledge is expressed in tangible form, societies have seen fit to offer protection under the rubric of intellectual property laws. However, these legal protections have emerged from a "western" or "developed" legal tradition and are often inadequate to deal with the scenarios in which indigenous knowledge often resides. The dominant global perspective on the ownership of knowledge is furthermore based upon commercialization and exploitation. There is, however, a renewed interest in the rights (including ownership rights) of indigenous people (United Nations General Assembly Resolution, 48/163:1993; Lipinski & Britz, 2000). This is accompanied by a growing need to incorporate alternative, non-economic, viewpoints into the present global legal infrastructures. This new emerging perspective may be, amongst other, a reflection of the "new politics of identity" where indigenous people struggle for "recognition of cultural diversity" (Axford, 1995:174).

6.2 Indigenous knowledge and the growing importance of plant biodiversity and medicine from natural resources

In the health field, 80% of the world's population is at least partly dependent upon traditional medicine and medicinal plants to treat their ills. In the light of the above, the conservation of pharmaceutical biodiversity is critical.

More than two-thirds of the world's plant species – at least 35 000 of which have potential medicinal value – originate in developing countries (refer to Figure 1).¹



According to an inter-governmental meeting of Southern experts in Tanzania in 1990, at least 7 000 medical compounds in the Western pharmacopoeia – from aspirin to birth control pills – are drawn from plants. The estimated value (manufacturer's price) of Third World countries medicinal materials could range from \$ 35 million to \$ 47 billion by the end of 2000.

¹ The Crucible Group. IDRC. 1994, 140 pp. People, plants and patents. The impact of intellectual property on trade, plant biodiversity and rural society. ISBN 0-88936-725-6, www.idrc.ca/books/725/chap1.html

Because the development of medicinal plants relies heavily on the knowledge of indigenous people and rural societies, concerns about equitable benefit sharing and intellectual property inevitably arise. While the benefits to drug companies are clear, the contributions of indigenous people, whose knowledge and innovation are often the key of drug development, generally go unrewarded.

6.3 Possible problems with current laws

6.3.1 Patents and indigenous medicine

A chemical or pharmaceutical patent derived from a plant or the patent of a crop plant derived from “newly discovered” indigenous stores of flora knowledge can contribute greatly to the health and wellbeing of many beyond the confines of the indigenous culture (and to the profit margins of developers, i.e. pharmaceutical companies) (King, 1996:2).

Again, the concept of property embodied within the patent law does not mesh well with the environs in which the indigenous knowledge is used. There exists fundamentally a problem of recognition of ownership of natural resources and the proper compensation to be paid for the exploitation of these resources and if it should involve intellectual property rights at all.

The particulars of discovery or development of the plant into a commercially viable patent (it may be a naturally occurring plant that is only patentable after mutation/alteration or processing) often do not coincide with the ownership rights the patent laws offer. As a result, there is inadequate recognition of ownership rights due to the indigenous contact or referral and thus compensation to the source’s originator, the indigenous people, is seldom forthcoming by legal right.

Western interests are often responsible for the development and marketing of a viable commercial version of aboriginal plant therapy

In the light of the above, the following questions may be posed: what rights, if any, should reside in the indigenous people that have served as caretaker and developer of the knowledge, often accumulating expertise in the use of the fauna and flora of their environment for centuries? How should these rights be balanced against the reapers and developers of that knowledge without whose effort and contribution the knowledge would not be widely available or commercially viable or even medically palpable to the general population? Also, should indigenous people be able to control the use or release of their knowledge in the first instance?

The main problem is not the patentability of the drug therapy, but who is entitled to the ownership rights. For example, many drug therapies are described first, not in the medical or pharmaceutical literature, but in the anthropological literature as indigenous case studies, the medicinal use of plants being merely one part of a larger study.

Another problem arises when considering the sharing of a patent between the original holder (traditional healer or indigenous group) and the developer (pharmaceutical company). Does the traditional healer or indigenous group truly know how and the extent to which their use of the drug will actually be applied in a mass-market product? Furthermore, development of the finished product takes place without any involvement from the originating indigenous resources. According to Lipinski & Britz (2000:25), merely supplying useful background information about the benefits of a useful medicinal plant is not enough for the patent requirement of co-contributor or joint inventor. Whether the contribution of indigenous knowledge is an essential part of the conception, depends on details of collaboration, the method of development and type of patent sought.

The publication rules may be less a problem where the specific goal of plant development is involved. This is true because the publication must be more than a mere passing mention (for purposes of novelty).

Furthermore, a pharmaceutical company would be careful by its own act to not trigger the activation of publication rules (the statutory bar) with respect to medicinal fauna and flora that it intended to develop. "Simply naming a plant used in indigenous medicinal systems, or even describing its particular uses, activities, and effects, will not provide a drug developer of ordinary skill with the means for developing a drug from that plant without additional inventive contribution by the developer." (Lipinski & Britz; 2000:26).

While patent protection might be shared with the indigenous knowledge holder, it seems unlikely. Legislative amendment could of course make it so, but this would skew the existing concept of "inventor" under existing patent laws. However, some other ownership right in the indigenous people could be granted. Lipinski and Britz (2000:26) contend that this could involve firstly a claim to share in the economic interest, either in terms of initial monetary compensation or a right to share in the subsequent revenue stream if developed successfully and secondly a general right of control over the development or exploitation. This would include not so much an ability to prevent development by others in the first instance, but in the ability of the indigenous people to preserve their traditional access to the source of knowledge, be it fauna or flora.

6.3.2 Moral Rights

One mechanism to protect intellectual property is based upon rights of personality or persona (Liemer, 1998:7). Moral rights are based on civil law concepts and acknowledge the natural rights of authors (*droit d'auteur*) to control the disposition of their creation beyond commercial considerations. Moral rights include the following three rights:

- The right of attribution (*droit a la paternite*). This grants holders of the right the ability to be identified as the originator of the work (paternity right). It implies also the right to be free from false attribution.

- The second moral right is the right of integrity (*droit a l'integrite*) which includes the right to protect the integrity of the work (prevent modification, alteration and excessive criticism).
- The third moral right to control the public presentation or disclosure of the work (*driot de divulgation*). The creator of a work has a right to determine when the work is finished, thus disclosed to the public and thus formally published. The creator of a work can also withdraw after publication the work from public use (Peeler, 1999: 423).

Moral rights have the potential to protect indigenous knowledge and enhance the harmonization of international intellectual property law (Farley, 1997: 20). This is due to the fact that moral rights cannot be alienated from its creator. In the present discussion, the rights of paternity and integrity impact most upon the expression of the indigenous culture and knowledge. These rights implies that a creator (of indigenous knowledge) has the right to be identified as creator and the right to object to uses of the work which would discredit the reputation of the creator. The additional right of non-disclosure can apply to cases in which a commercial developer makes public the indigenous knowledge without permission or expresses indigenous knowledge in such a way that it would harm the indigenous culture. This might occur if a particular fauna and flora used by indigenous people are harvested into extinction.

Unfortunately, moral rights are individual rights and not communal rights. Moreover, moral rights typically protect unique works of art and would not protect general indigenous knowledge expressed through commonly known stories or shared folk remedies. If moral rights could be expanded to the community or groups it might hold promise for protecting the commercial exploitation of indigenous knowledge.

6.3.3 Commercial misappropriation

Intellectual property protects tangible information. However, the question is whether intellectual property protects intangible knowledge. Since this is the status of much of the store of indigenous knowledge, should the law not also be extended to protect intangible indigenous knowledge from commercial exploitation?

In the present legal system information, which is in an intangible form such as a mere business idea is protected from unauthorized taking and/or commercial exploitation. This is known as misappropriation. However, it is mostly applicable to factual information. Misappropriation acts as a finder's fee mechanism: encouraging the finders to seek more information secure in the knowledge that if any revenue stream is generated by another's use of that information then the original collector or compiler will likewise share in any revenue stream that the use thereof creates. An example of this phenomenon would be indigenous medicinal knowledge used by traditional healers and the commercial interest of pharmaceutical companies in this valuable commodity.

Indigenous knowledge is more than mere facts, and thus no longer subject to continuous "discovery". According to Lipinski & Britz (1999:6), this implies that the granting of misappropriation ownership rights to the indigenous would not have a negative impact on the discovery – collection – creation incentive system as the discovery, collection and creation is already exploited. The application of the misappropriation right could therefore reward the indigenous when the initial discovery, now perhaps centuries old, is found to have commercially relevant use today. The concept is grounded in the protection of commercial exploitation of another's knowledge. Therefore indigenous people will be protected from developers (e.g. pharmaceutical companies) who might collect indigenous knowledge at no or little cost and commercially exploit it in the market place. The right of misappropriation would furthermore recognize the great efforts of indigenous, often over generations, in contributing to the knowledge base of others.

6.3.4 Protection of indigenous property

Information in traditional societies is mostly seen as a primary good and therefore it plays a major role in the economic, political and cultural processes in which societal members are engaged. Considering the global importance of information, one of the main issues is therefore the fair and equal distribution of information. It has, however, been argued that the development and implementation of primarily Western concept of intellectual property and notions of property being based on exclusiveness, has had a major impact on the way in which information is being distributed. This may lead to a paradox between the reality of the co-modification (of information) processes and the goal of information and knowledge dissemination in society (as a renewable resource).

Lipinski and Britz (2000:27) argues that ownership information must not only be based on a legal perspective but also be investigated from a moral perspective based on social justice. Since uneven and even imperfect distribution of information can have serious economic, political and social implications, a theory of justice must be found that can be used to evaluate unequal distributions in an attempt to gauge socially acceptable levels of disparity, or alternatively, succeed in achieving justice.

Within the framework of these emerging perspectives, the present shortcomings and inadequacies in the present global legal infrastructure were investigated by Lipinski & Britz (1999:1), who proposed a possible solution of harmonization of current laws.

The authors' objectives were to illustrate that both the current (private and exclusive) and alternative (communal or public) legal perspectives on knowledge ownership (intellectual property) can be harmonized in order to protect indigenous knowledge from further exploitation.

Lipinski & Britz (1999:1) illustrated how the use of present legal infrastructures support the existing free market system based upon individual ownership, demonstrated how strands of these various concepts might be woven into a new protection scheme (Kuruck, 1993: 842). Deconstruction assists in questioning the present global information property world order; it provides the building blocks upon which a new order, one which would protect indigenous rights, might be fashioned. In response to this a discussion of ethical implications resulting from the disparity of ownership and control rights is undertaken. This provides a moral basis upon which past practices may be evaluated and future protection mechanisms designed. This ethical framework is based on the work of John Rawls.

Western legal infrastructures support a market orientated property system and this often results in an inadequate or inconsistent mechanism for the articulation of social, political or ethical considerations (McEvoy, 1998:100). However, this does not exclude the possibility that these property-based mechanisms could not be used in future to become more adequate and consistent.

6.4 Possible harmonization of current legislature

6.4.1 South Africa's alternative legal approach to protect its indigenous knowledge²

South Africa's proposed way in which to protect and promote indigenous knowledge is to formulate, apart from intellectual property, separate legislation dealing specifically with indigenous knowledge. South Africa is one of the few countries that has adopted such an approach. Not only has the country drafted a bill on the "Protection and Promotion of South African Indigenous Knowledges" but it has taken other initiatives to protect and promote its rich wealth of indigenous knowledge.

² Refer to Chapter 4 (4.6.1.2), where this subject was discussed in further detail

These initiatives include, *inter alia*, the establishment of an Indigenous Knowledge System Programme (IKSP), the initiation of research projects to determine how indigenous knowledge and indigenous technologies can contribute to innovation in South Africa, setting up research projects to determine the value of traditional medicine.

South Africa has realized that the sharing of indigenous knowledge within and across communities can help to enhance the process of cross-cultural understanding and the promotion of the cultural dimension of development. It also acknowledged that indigenous knowledge could provide a basis for problem-solving strategies for local, poor communities.

As was already mentioned in Chapter 3 (3.2), there is, however, not only a need to promote the use of indigenous knowledge in South Africa. There is also a serious need to protect it from exploitation and possible extinction. This is specifically applicable to indigenous medical knowledge. South Africa is the third most biologically diverse country in the world, with more than 30 000 plant species - 80% of these species are endemic to the region. Many of these species are used by traditional healers (of whom there are more than 200 000 in South Africa) as medicine. However, two problems arise. The one is that 15% of these species are under serious threat of extinction (Jordaan & Britz, 1999:4).

The second is that of bio-piracy. It is estimated that over a dozen Japanese, European and American pharmaceutical companies obtain their raw material from Africa, and treat the host countries as global warehouses to be exploited by paying them extremely low prices for the plant species that are used (Dutton & Dutton, 1997:1). The problem is that there is currently no up to date legal protection in terms of intellectual property in South Africa for indigenous knowledge. Once a local community gives away its indigenous medical knowledge it has lost control of the valuable resource. This is one of the main reasons why South Africa has formulated a White Paper on the Protection of Indigenous Knowledge which will be presented to Parliament.

The main aim of this draft bill was extensively discussed in Chapter 4 (4.6.1.2). In the preamble of the draft bill it is also stated that indigenous knowledge systems represent an important part of the living culture heritage of the nation, and that South African must recognize the need to identify resources that are unique to South Africa.

It seems that South Africa, in its search for a fair and just protection of its indigenous knowledge, has opted for an alternative legal approach.

6.4.2 The deconstruction and reconstruction of indigenous knowledge rights

Lipinski & Britz (1999:9) postulated the following probing questions: Should the present legal infrastructure continue unaltered? This might then imply that indigenous people are without any legal resources as the legal system assigns ownership and control rights to persons other than the indigenous .If protection should exist, should such a mechanism rest on some form of an intellectual property right? Should it derive from some other property right: right of publicity, misappropriation, a non-property right or the articulation of a sui generis right, derived from a combination of existing concepts several equitable or quasi-equitable principle and specifically addressing the rights of indigenous?

The designing of any protection mechanism raises problems of definitions, of exclusion and inclusion. The notion of deconstruction, as a form of criticism, is of particular relevance to the present discussion of communal versus individual rights and exclusions. Deconstruction is critical of definitions in general and for that reason is relevant to the present discussion as globalization by its design imposes external definitions on internal and communal indigenous systems. Due to the fact the law is constructed, it can be de- and re-constructed (Caputo,1997:130). The deconstruction argument can therefore be used for the protection of indigenous knowledge.

The question is how to find a balance in these competing interests (ownership rights of authors to control the work versus access rights (and under deconstruction creation rights as well) of users)? Deconstruction might suggest a preservation of these paradoxes by not precluding the structuring of a mechanism that prevents others from using indigenous knowledge, but rather the structuring process would look to meeting the concerns posed by deconstruction, while at the same time forwarding the rights of indigenous. This would imply a strategy to identify the purpose behind those intellectual property regimes as discussed above. In this process deconstruction would force a return to the underlying precepts: societal benefits. (Lipinski and Britz, 2000:3) The process of reconstructing the law would then focus on the preservation of the rights of the indigenous to maintain the use and interpretation of their knowledge by offering protection from practices of others that interfere with the exercise of those rights.

It can therefore be argued that an indigenous community has a legitimate right of control to its indigenous knowledge, specifically when the commercial exploitation of the knowledge is involved.

6.4.3 The moral foundation based on social justice

Lipinski and Britz (2000:28) proposed a framework for new legal structures in order to realign current property laws that subsequently will aid in the upliftment of information-poor societies. According to the authors, there are four categories of social justice applicable to a situation of information poverty: commutative, distributive, contributive and retributive justice. Applied to indigenous medicinal knowledge systems, the following may hold true:

- *Commutative justice*: calls for fundamental fairness in all agreements and exchanges between individuals or social groups. In its economic application, it calls for equality in transactions and it is applicable in cases where information is treated as a commodity. Commutative justice is of specific relevance in the dealing of indigenous medicinal knowledge.

In terms of access to information, commutative justice underscores the importance of a fair relationship between buyers or developers (pharmaceutical companies) and sellers or creators (indigenous people) of information. The economic gain from the commercialization of indigenous medicinal knowledge must also not be at the expense of the least advantaged society. The contribution of indigenous medicinal knowledge and patent process must be recognized. Since large pharmaceutical and biochemical companies (or developers) draw tremendous economic value from the indigenous knowledge of a new drug entity, it is only fair that the indigenous people be compensated for that contribution. Before undertaking to collect information pertaining to indigenous medicinal knowledge, the researcher or developer should have some idea of how the community in question might benefit from the exercise. Perhaps the ethno-biological information can be shared with the community or used for future development projects in the area, e.g. in the fields of ethno-medicine and indigenous agricultural systems and general plant uses such as food, construction material and dye.

- *Distributive justice*: is concerned with the fair allocation of the benefits of a particular society (for instance income, wealth, power and status) to its members. It applies to situations where information is treated as a primary good. Distributive justice performs to the fair distribution of information to people and the accessibility thereof, in order to satisfy basic needs. With regards to indigenous medicinal knowledge, there should be free access to and local communities should make available its innovation and practices in relation thereof, to other communities, provided that such innovation is not acquired for commercial utilization. Under the concept of distributive justice, indigenous medicinal knowledge should be shared with others outside the originating culture and promoted. It should, however, be protected from exploitation.

Distributive justice requires that the developer (those that add value to existing indigenous medicinal knowledge) must never exude the indigenous people from continuous use of the information, since indigenous medicinal knowledge tends to be more essential to daily existence and survival in the practices of their culture, than it is to the people of the world at large.

- *Contributive justice*: is applicable here information is treated both as a primary good and as a commodity. Thus dealing with the creation of equal opportunities through equal access to information and knowledge. Regarding the flow and access of information, contributive justice can serve to maximize the use of information for productivity. Based on this viewpoint, it can be argued that society has a responsibility to create a legal and moral environment that will stimulate creativity and productivity, e.g. encourage knowledge creation by both indigenous people and Western developers. The creation and processing of indigenous medicinal knowledge must be encouraged as well as the temporary outflow of human capital – because it can be an effective way of acquiring foreign knowledge which can be used to the benefit of society. Indigenous medicinal knowledge can be made available to the less knowledgeable within the community, especially the young, by means of printed word and other learning materials.
- *Retributive justice*: also known as punishable justice, refers to the fair and just punishment of the guilty. With regard to access and use of information, it acts as an important guideline for the protection of indigenous medicinal knowledge. Under this category of justice, indigenous knowledge should be the subject of retribution; the purpose of which is to compensate for past harms and by the threat of its imposition, it limits future acts of appropriation of indigenous medicinal knowledge to those that are justified.

Lipinski and Britz (2000:28) contend that the application of the above mentioned theory can then be used to assess the role of information control and access mechanisms, for example, the intellectual property laws, in affecting the distribution of indigenous knowledge. Based on the work of Lipinski & Britz (2000:41), the following proposals are made:

- *Recognition of ownership rights:* Indigenous people have an ownership right in the indigenous medicinal knowledge associated with their culture. This right may extend beyond present intellectual property regimes. (Distributive Justice)
- *Recognition of custodianship rights:* Communities should have rights to the custodianship or stewardship of their innovation. (Distributive Justice)
- *Recognition of moral rights:* Indigenous knowledge should be used in a way that preserves the culture from which it was derived. The use of knowledge should maintain the integrity of the indigenous knowledge, not disparage the indigenous culture from which it was derived, and allow for the proper identification or attribution of the indigenous people as a source of the knowledge. (Contributive Justice: freedom and integrity)
- *Recognition of economic interests:* Indigenous people must have recognized rights over the use and dissemination of their indigenous medicinal knowledge in the commercial market place. If economic benefit is derived from the use of the indigenous knowledge, the indigenous people should have the right to share in the commercial exploitation of the knowledge, and possibly control the initial economic use of the knowledge. (Commutative Justice)
- *Recognition of development rights:* Any local community may opt to be paid a non-monetary equivalent as may be determined by the local community in accordance with its customs, practices and usage (Commutative Justice)

- *Recognition of problems with current laws:* Oral traditions must be protected under international and national intellectual property and other laws, in addition, current problems with the intangibility of knowledge from indigenous people must be confronted and resolved. (Distributive Justice and Contributive Justice: participation and production)
- *Consideration:* Place a moratorium on any further commercialization of indigenous medicinal knowledge until international, national and local indigenous communities have developed appropriate protection mechanisms. This insulation will allow indigenous cultures to at least survive, perhaps prosper (increasing the diversity for all), instead of wither. (Commutative Justice and Retributive Justice)
- *Consideration:* Ethical deliberation should recommend and result in the expansion of legal mechanisms that protect alternate indigenous interests in their knowledge. (Distributive Justice)
- *Consideration:* Indigenous people should have the right to use the intellectual property of others in an expanded application of the general law as it would apply to non-indigenous users if conditions of moral justification warrant, e.g., use of another's intellectual property in a commercial setting would not be allowed. This practical expression might take the form of a shortened period of copyright duration protection or adoption of the compulsory license schemes for developing nations discussed earlier is consistent with the analysis of social justice as proposed and interpreted herein. (Commutative Justice, Distributive Justice, Contributive Justice and Retributive Justice)

6.4.4 Practical proposal based on social justice

This section proposes a framework for action to promote and create awareness of the importance of indigenous medicinal knowledge to indigenous people and other role players (developers, e.g. pharmaceutical companies). The framework would revolve around four pillars:

6.4.4.1 Disseminating information

- *Disseminating information:*
 - ✓ Providing tools and methods for recording of indigenous medicinal knowledge and indigenous food plants (e.g. fieldworker handbooks).
 - ✓ Educating indigenous people on conservation of plant species and their habitats and related indigenous medicinal knowledge.
 - ✓ Educating indigenous people on the value of indigenous medicinal information (economically as well as for social upliftment).
 - ✓ Educating indigenous people on Agroforestry, especially the planting of multipurpose indigenous trees and shrubs which have food value in addition to such benefits as shade and medicinal qualities.
 - ✓ Developing a comprehensive database (a pharmacopoeia for Southern Africa) of indigenous medicinal practices relating to the use of fauna and flora and comparing the use of different plant/animal substances amongst the different ethnic groups.
 - ✓ Publishing selected cases in print (by means of a newsletter) and electronic format.
 - ✓ Developing a web-page to cater for all the most important ethnic groups in South Africa in their own languages.

6.4.4.2 Facilitating exchange of information

- *Facilitating exchange of indigenous medicinal knowledge among developing communities:*

- ✓ Assisting local community to share indigenous knowledge amongst themselves.
- ✓ Identifying appropriate methods of capturing and disseminating indigenous knowledge among communities.
- ✓ Facilitating a global network (e.g. Internet) to exchange indigenous medicinal knowledge.

6.4.4.3 Applying indigenous medicinal knowledge

- *Applying indigenous knowledge in the development process:*
- ✓ Raising awareness of the importance of indigenous medicinal knowledge by means of brochures being distributed or advertisements on television, in newspapers and magazines.
- ✓ Integrating indigenous medicinal practices in projects supported by developers.

6.4.4.4 Building partnerships

- *Building partnerships:*
- ✓ Speaking to and learning from local communities and traditional healers and trying to understand their knowledge systems and eliciting their technical knowledge.
- ✓ Addressing the intellectual property rights issues of indigenous knowledge
- ✓ Discussing compensation / Royalties (Compensation for the creation, compilation and distribution of knowledge will contribute to the stimulation of future creativity regarding the creation of knowledge).



6.5 Conclusion

In today's global marketplace, no stone goes unturned. Where there is commercial value, there are profits to be made. However, as entrepreneurs scour the world in search of new drug commodities, a voice of dissent is growing and striving to be heard. That voice belongs to the world's indigenous people, and it is a voice that has been ignored long enough.

It has been suggested that, if pharmaceutical companies can secure intellectual property protection for their "inventions" – even those derived from the knowledge systems of indigenous people, then indigenous people too, should be entitled to intellectual property protection.

Contemporary intellectual property law permit only the patenting of an identified active principle from a plant, not the plant or folk information relating to the medicinal properties of the plant. The most significant rights of indigenous people are those deriving from physical control of the plants and the knowledge pertaining to their use. This control can provide the basis for trade secret protection. Such agreements are enforceable in developed nations and should become so in developing nations.

There have been recent efforts to strengthen indigenous people's rights over relevant medicinal knowledge, but the most far-reaching of these are not yet a part of international law. Pharmaceutical patents combined with trade secrecy can allow companies to develop and market medicine and ensure that the ethnic group from which the material or information was derived is properly rewarded. However, a uniform agreement that deals in a balanced way with the relative rights of indigenous people should be developed.



CHAPTER 7 CONCLUSION

Concerning the central statement of this study, namely the protection of indigenous medical knowledge, the following conclusions can be made:

7.1 Indigenous knowledge

As indicated in this study, the importance of studying indigenous people's knowledge of natural resources, is becoming increasingly apparent in the face of widespread failure to alleviate poverty in Third World countries and the continued decline of environmental conditions in the wake of spreading global technologies. An understanding what happens to indigenous knowledge systems within this turbulent context is therefore of critical importance for the autonomy and well being of disadvantaged populations facing resource shortages, especially in developing countries such as South Africa.

As the focus of this study, in Chapter one, the term "indigenous knowledge" was defined. The author described the characteristics of indigenous knowledge and highlights the special features of indigenous knowledge, which distinguishes it broadly from other kinds of knowledge. Several pertinent examples of indigenous knowledge are given. The author further discussed the numerous fields of application of indigenous knowledge and concluded the chapter with the contributions of indigenous knowledge to development and information wealth.

From this chapter, it became apparent that, in the current milieu of an information economy versus the industrial economy of the past, indigenous knowledge and its application, is the true measure of information wealth for developing countries.

7.2 Indigenous knowledge and biological diversity

Since indigenous knowledge is such a diverse field of knowledge which does not only encompass cultural heritage, but is also closely linked to biodiversity (i.e. through indigenous medicinal practices and plant knowledge), this subject and its relation to biological diversity was further explored and highlighted.

Biological diversity (biodiversity) which encompasses the totality of genetic resources, varieties and ecosystems, is the very foundation of life on earth. Unfortunately, it is diminishing at an alarming rate, as human expansion forces the ever-increasing numbers of species into extinction.

In this chapter, the author discussed the importance and economic benefits of biological diversity in particular in South Africa, which ranks as the third most biologically diverse country in the world, with its rich variety of plant species. The author highlights the fact that in economic terms, biological diversity may be viewed as a resource that has enormous present and future value which is currently undiscovered, undervalued or underutilized. The indigenous people's rights to biodiversity is discussed.

The chapter is concluded by examples of indigenous knowledge being used by traditional healers for traditional medicine and as food sources in a few African countries (Kenya, Madagascar, Morocco, Namibia, South Africa and Uganda). This highlights the right of ownership of these indigenous people hereto as well as the need of proper legal regimes to protect this most important commodity.

7.3 Current intellectual property regimes and indigenous people

Chapter four deals with the contentious issue of who owns, who has access to and who benefits from indigenous knowledge and the biological resources from which it is derived.

Since current Western jurisprudence is limited in its conception of intellectual property, it therefore needs to be expanded to accommodate indigenous knowledge system notions of ownership.

In this chapter, the author defines intellectual property and continues to highlight the importance of intellectual property and its application to indigenous people.

The author discussed the history of international intellectual property laws and investigates their application in intellectual property laws in Third World countries. Here the author supplied the reader with two case studies from two African countries, namely Ethiopia and South Africa.

From this chapter, it is evident that 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.

7.4 The exploitation of indigenous knowledge

Indigenous medicine has for centuries been the mainstay of the health care system in non-Western communities and traditional knowledge related to human health, is currently the basis of primary health care for a large part of the world's population.

In chapter five, the author highlights the importance of indigenous medicine and the commercial importance of bioprospecting. Within the current scenario, the author investigates the implications of the patenting of products and substances derived from the natural environment.

Different case studies dealing with global commercial exploitation of indigenous medical knowledge, are discussed (i.e. India, Australia, Cameroon and South Africa).

7.5 Critical evaluation and possible harmonization of problems associated with current laws and proposed solutions

While conventional intellectual property rights systems are largely ineffective in providing recognition and protection for indigenous knowledge, there are some other avenues that have potential to offer solutions. In chapter six, some solutions of these problems were discussed, e.g. alternatives to intellectual property systems that may offer more productive opportunities for the protection and promotion of indigenous knowledge.

The author investigates the growing importance of plant biodiversity and medicine from natural resources. Then possible problems with current laws (patents and indigenous medicine, moral rights, commercial misappropriation and protection of indigenous property) are discussed.

The author investigated the following avenues for the possible harmonization of current legislature: deconstruction and reconstruction of indigenous knowledge, moral foundation based on social justice and finally practical proposals based on social justice. The following practical examples were elucidated by the author: disseminating information, facilitating exchange of information, applying indigenous medicinal knowledge and building partnerships with indigenous people.

From this chapter it is evident that the harmonization of intellectual property rights and traditional knowledge and belief systems are extremely difficult and whilst not refuting the importance of intellectual property rights, the author proposes a paradigm shift to focus also on the moral and social rights of indigenous people.



7.6 Proposed further research themes

In retrospect, the following research themes, which can be regarded as relevant to indigenous medical knowledge, can be indicated:

- Indigenous knowledge and distribution of economic benefit.
- Indigenous medicinal knowledge. Is it a true measure of information wealth?
- Indigenous medicine: information acquisition and database creation