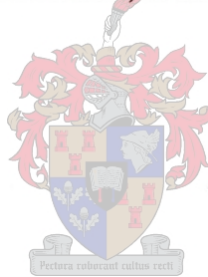


**INTELLECTUAL PROPERTY RIGHTS AND THE PROTECTION
OF TRADITIONAL KNOWLEDGE IN WESTERN CAPE
AGRICULTURE**

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This is presented in partial fulfillment of the requirements for the degree of Master of
Commerce (Agricultural Economics) at the University of Stellenbosch.



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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Summary

This study analyses the extent to which the current intellectual property system is suited to the protection of traditional knowledge in the Western Cape. Employing a multidisciplinary approach that incorporates economic and legal theory as well as legal philosophy, this study argues that although advances in the fields of biotechnology has brought with it the need for greater intellectual property rights protection, the protection of traditional knowledge has largely been ignored. Traditional ethnobotanical knowledge holds immense economic value for both commercial entities seeking to develop products based on traditional knowledge as well as for the communities that possess such knowledge. Protecting traditional knowledge is necessary to ensure that the communities contributing their knowledge are recognized and compensated for such contributions. In order for a system to provide adequate protection for traditional knowledge it has to be consistent with and suited to the needs of traditional knowledge holders. This study therefore evaluates the prevailing system of knowledge protection as embodied in the intellectual property rights regime as a means of protecting traditional knowledge. The analysis reveals that the dominant justification for the existence of IPRs is based on utilitarian considerations that promote IPRs as a necessary incentive encouraging innovative activity. This utilitarian justification also provides the basis for an economic justification for the existence of IPRs that suggests that the conferring of exclusive rights (in the form of IPRs) to innovators ensure that such innovators are able to recover their research costs and realize profits from their inventions. The IPR system as it exists is underpinned by these considerations and embedded in principles of individualism and private property. The WTO reinforces and promotes this approach to intellectual property in the TRIPs agreement by recognizing intellectual property as a 'trade related' issue. The inclusion of IPRs as a 'trade related' issue in the multilateral framework of the WTO reflects the interests of multinational corporations and developed nations who rely extensively on these mechanisms to maintain their power and wealth in an increasingly knowledge driven global economy. The exclusion of traditional knowledge within the TRIPs, coupled with the desire to extend patents to cover life forms is also indicative of this bias inherent in the system. South African intellectual property legislation is then applied to the traditional knowledge of an indigenous medicinal plant to test whether IPRs are able to provide

adequate protection to traditional knowledge. In this regard it is found that patent protection, which could potentially provide the greatest form of protection for traditional knowledge is not suited to the needs of traditional knowledge holders. Problems of identifying owners, determining inventors and novelty, time limited rights and costs all limits the potential of patents as a tool for protecting traditional knowledge. Similar constraints limit the potential of other categories of IPRs to provide protection for traditional knowledge. However, it was found that IPRs do provide a certain measure of defensive protection. The study therefore concludes that the IPR system as it exists, both in the international trade environment as well as at the national level, fails to adequately address the threat of appropriation and the concerns of traditional knowledge holders. Amending the IPR system and/or developing *sui generis* systems of protection are therefore necessary to ensure that the knowledge of communities are protected and such communities are able to benefit from the exploitation of their knowledge and resources.

Opsomming

Die doel van hierdie studie is om vas te stel in hoe 'n mate die huidige sisteem vir die beskerming van intellektuele eiendom geskik is vir die beskerming van tradisionele kennis in die Wes-Kaap. 'n Multidissiplinêre benadering, wat uit elemente van ekonomiese- en regssteorie sowel as regsfilosofie haal, is gevolg om te wys dat die beskerming van tradisionele kennis grootliks geïgnoreer is, alhoewel nuwe deurbrake in biotegnologie die behoefte skep vir groter beskerming van intellektuele eiendom. Tradisionele etnobotaniese kennis het geweldige ekonomiese waarde vir beide die kommersiële entiteite wat produkte uit sodanige kennis wil produseer sowel as vir tradisionele gemeenskappe aan wie die kennis behoort. Dus, indien sulke gemeenskappe voordeel wil trek uit hierdie kennis, is dit nodig dat hul bydraes erken moet word, en dat hulle daarvoor vergoed moet word. Sulke beskerming sal net doeltreffend wees indien dit aangepas is by die behoeftes van hierdie gemeenskappe. Dus word die huidige sisteem vir die beskerming van tradisionele kennis geëvalueer in hierdie studie. Die ondersoek wys dat die sisteem vir die beskerming van intellektuele eiendom berus op die teoretiese basis van nutsmaksimering, waar die hoofdoel te vinde is in die bydrae wat dit kan maak tot ekonomiese welvaart deur middel van innovasie. In hierdie opsig word beskerming van intellektuele eiendom beskou as 'n manier waardeur die innoveerder sy navorsings- en ontwikkelingskoste kan delg en wins kan maak. Hierdie benadering word onderskryf deur die WTO in die TRIPS Ooreenkoms. In hierdie opsig word die belange van veral die ryk lande en die multinasionale maatskappye bevorder, 'n sleutelvoordeel in 'n wêreld waar kennis gepaardgaan met mag in die mark. Hierdie verskynsel word versterk deur die uitsluiting van tradisionele kennis van die TRIPS Ooreenkoms en die behoefte daaraan om patentregte uit te brei.

Suid-Afrikaanse wetgewing oor intellektuele eiendom word vervolgens toegepas op die geval van tradisionele kennis oor 'n inheemse medisinale plant om te toets of intellektuele eiendomsreg genoegsame beskerming aan tradisionele kennis bied. Daar is gevind dat patentregte, wat potensieël die grootste mate van beskerming sou kon bied, nie gepas is in die geval van houers van tradisionele kennis nie. Probleme wat voorkom sluit in die identifisering van eienaars, innoveerders en innoverings, die

tydsbeperking op regte, asook kosteoorwegings. Ander vorms van beskerming is aan soortgelyke kritiek onderhewig, alhoewel bevind is dat intellektuele eiendomsreg wel 'n mate van defensiewe beskerming bied. Die gevolgtrekking word dus gemaak dat die huidige vorms van beskerming vir intellektuele eiendomsreg, beide internasionaal sowel as in Suid-Afrika, nie die belange van die houers van tradisionele kennis beskerm nie. Dit is dus nodig om die huidige vorms aan te spreek, of om *sui generis* beskerming te ontwikkel om hiervoor te sorg.

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LIST OF ABBREVIATIONS

CBD	Convention on Biological Diversity
CIPR	Commission on Intellectual Property Rights
CSIR	Council for Scientific and Industrial Research
DEAT	Department of Environmental Affairs and Tourism
DTI	Department of Trade and Industry
EU	European Union
FAO	United Nations Food and Agricultural Organization
GATT	The General Agreement on Tariffs and Trade
GI	Geographical indications
IP	Intellectual Property
IPRs	Intellectual Property Rights
NDA	National Department of Agriculture
NGOs	Non-governmental Organizations
NIE	New Institutional Economics
PIC	Prior Informed Consent
TK	Traditional Knowledge
TRIPs	Agreement on Trade Related Aspects of Intellectual Property Rights
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UPOV	The International Union for the Protection of New Varieties of Plants
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
ZAPTO	South African Patents and Trademark Office

CHAPTER ONE

INTRODUCTION

1.1 CONTEXT OF STUDY

Traditional knowledge has been and is increasingly being used in a wide range of industries for the development of new products. This is especially true of the food and beverage, pharmaceutical, agriculture, personal care and cosmetic sectors (Downes and Laird 1999, Halewood 1999, Toffel 2002). Increasing awareness of the economic value of biological diversity has resulted in industries seeking to exploit traditional knowledge and biodiversity through opportunistic behaviour (Wynberg 2001). The term used to describe this behaviour is bioprospecting, which refers to the systematic search of natural biological resources for new sources of chemical compounds, genes, proteins, microorganisms and other products that have potential economic value. Closely related to this term is the concept of biopiracy, which the Commission on Intellectual Property Rights (CIPR) defines as, "the appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals or institutions seeking exclusive monopoly control (usually patents and plant breeders rights) over these resources and knowledge."

No clear definition exists on what constitutes traditional knowledge, but it is often described as knowledge or practices of traditional peoples that are inextricably linked to the land and their environments. Daes (as cited in Downes and Laird 1999) notes that "because the structure and content of traditional knowledge is intimately linked with local bioresources and ecosystems themselves, the protection of rights to cultural heritage is closely linked to the protection of the environments and living resources of indigenous and local communities". Traditional knowledge is often characterised by the interrelationship of spiritual, practical, and innovative practices all of which revolve around reverence for the land and the land's sustainable use (Halewood 1999:959). Other important characteristics of traditional knowledge are that it is often derived and held collectively. This knowledge can be collectively known within a community, or known only to a specific people, or groups of people within the community (E.g. traditional healers). For the purposes of this study the traditional knowledge that will be investigated relates to ethnobotanical knowledge. Ethnobotanical knowledge refers to

the knowledge of wild plants with commercial potential, including species that contain compounds with pharmacological, pesticide, or other industrial properties.

The protection of traditional knowledge has long been ignored as developed nations and large industries sought to promote self-serving systems of protection. The Convention on Biological Diversity (CBD)¹ sought to remedy this by recognising the importance of protecting and promoting the use of traditional knowledge. Article 8 (j) provides that *"Members should respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices"*. Although traditional knowledge is legally protected under this article, the threat and perception that this protection is both inadequate and ineffective remain, as many indigenous and local communities fear losing control of their knowledge to outsiders seeking to appropriate its benefits (Downes 1997:1).

In a South African context, the reality of the threat to traditional ethnobotanical knowledge was recently highlighted by the Hoodia Cactus dispute involving the San Bushmen. This cactus is traditionally eaten by the San Bushmen of the Kalahari Desert in Southern Africa (Barnett 2001). This community uses the cactus as an appetite suppressant and thirst quencher, which assists them to endure long hunts and resist the temptation to eat their kill before returning to their camps. In April 2001 a British journalist, Antony Barnett, revealed that the Council for Scientific and Industrial Research (CSIR) had patented the appetite-suppressing ingredient of the cactus, which was dubbed P57, and granted development rights to a UK pharmaceutical firm, Phytopharm, which patented P57². Barnett reports that Phytopharm scientists announced that P57 would have none of the side effects that plague most slimming products, because it was derived from a natural product. This announcement resulted in a sharp rise in the share price of Phytopharm. Shortly afterwards the firm sold the licensing rights for the drug to Pfizer, the US pharmaceutical giant, for \$21 million. This entire process was completed without any consultation with the San community, the holders of this traditional knowledge.

¹ United Nations Convention on Biological Diversity 1993

² Information on the amount for which CSIR sold the development rights to Phytopharm is not available.

The central issue in this case was what benefits the San could have derived from the commercialisation of their knowledge. Although the San have subsequently reached a 'memorandum of understanding' for a possible benefit sharing agreement with the CSIR over the Hoodia patent (Khan 2002), the threat of similar disputes reappearing still remains. Goodwill on all sides has led to an acceptable agreement in this case, however there is no guarantee that goodwill will prevail in future cases.

Although agriculture contributes a small portion to the country's Gross Domestic Product (GDP)³ it continues to play a vital role in the national economy. In addition to accounting for a large proportion of total employment, the agricultural sector continues to represent a major source of foreign exchange earnings. The agricultural sector of the Western Cape plays a pivotal role not only in the provincial economy but also in the regional economy, contributing 9.5% of the Western Cape Gross Regional Product. The Western Cape generates nearly a quarter of the South African agricultural sector's total gross income and accounts for more than half its exports. WESGRO⁴ identifies agriculture as one of the primary pillars upon which the provincial economy is built, and goes on to state that although the province contributes some 14% to the country's GDP, it generates about 23% of the total gross income of the agricultural sector, which is by far the largest contribution of any of the nine provinces. The agricultural sector also provides the main source of income for many of the previously disadvantaged indigenous peoples (e.g. the San-in the Hoodia Cactus case).

As technological advances have continued driving the process of globalisation resulting in a more integrated global economy, traditional knowledge systems have come under increasing threat from bioprospectors. This is also happening in South Africa where a wide range of industries is developing new products (Laird and Wynberg 1996). The main problem in this regard is that in most instances current intellectual property legislation is insufficient to protect the rights and knowledge of indigenous communities.

The Department of Environmental Affairs and Tourism, which states that, "South Africa rank as the third most biologically diverse country in the world..." (DEAT 1997:2) provides an insight into the nature of South Africa's biological diversity. This is mostly attributable to "the extraordinary plant richness contained within the country:

³ 3.2% in 2000-(NDA: 2002)

⁴ WESGRO Cape Sector fact sheet available at www.wesgro.org.za/downloads/default.htm

some 18000 vascular⁵ plant species occur within our boundaries, of which 80% occur nowhere else” (DEAT 1997:2). Toffel (2002:7) estimates that about three-quarters of the plant sources that provide prescription drugs’ active ingredients came to the attention of researchers through their use in traditional medicine. He goes on to state that 80 percent of the worlds remaining biodiversity is to be found on indigenous lands. Increasing awareness of the economic value of biological diversity has resulted in industries seeking to exploit traditional knowledge and biodiversity through opportunistic behaviour (biopiracy).

The case of the Hoodia Cactus is indicative of this threat and highlights the increasing significance IPRs occupy in the international trade arena. The wealth of biodiversity in the country makes South Africa susceptible to these threats. The management of intellectual property rights therefore holds important implications for the South African and Western Cape economies, particularly the agricultural sector. The development and empowerment of rural communities who may possess valuable traditional knowledge can only be secured if such knowledge is adequately protected. The ability to protect their traditional knowledge impacts directly on the capacity of these communities to develop this knowledge and realise any potential economic benefits. The economic potential of traditional ethnobotanical knowledge has a vital role to play in the sustainable development of these communities.

1.2 AIMS, UNDERLYING ASSUMPTION AND LIMITATIONS OF STUDY

The aim of this study is to analyse the current intellectual property system and determine the extent to which it acts to protect traditional knowledge systems relevant to agricultural trade in the Western Cape. This research therefore aims to contribute to an understanding of the value traditional knowledge holds for the sustainable development and economic growth of communities and how such knowledge can be protected. It also seeks to provide value to every individual and community holders of knowledge where such knowledge has some commercial potential.

The research specifically aims to:

- Analyse the nature and value of traditional knowledge and determine the threats to traditional knowledge;

⁵ The Concise Oxford dictionary defines a vascular plant as “a plant with conducting tissue”.

- Evaluate the existence and justifications for the existence of intellectual property rights protection in the global trading environment;
- Analyse this system of protection as it applies to traditional ethno-botanical knowledge;
- Investigate alternative systems of protection and the extent to which they may act to protect traditional knowledge whilst taking cognisance of obligations incurred through relevant agreements (TRIPs, CBD, UPOV)⁶.
- Draw implications for the protection of traditional ethnobotanical knowledge for the Western Cape.
- Provide conclusions and recommendations based on the research findings.

The study is limited to ethnobotanical knowledge in the Western Cape, i.e. knowledge of wild plants with commercial potential, including species that contain compounds with pharmacological, pesticide or other industrial properties in this area. The categories of IPRs that will be analysed include patents, geographical indications and trademarks. Each of these categories will only be investigated with regard to the economic and legal implications they hold for the protection of traditional ethnobotanical knowledge.

Traditional knowledge protection also contains an important social dimension. However for the purposes of this study the social implications of protection of such knowledge is not detailed and is only evaluated in so far as it has economic and legal implications for the communities.

This study is also limited to how traditional knowledge may be protected, whilst remaining committed to the provisions of multilateral agreements. The most important of these are the United Nations Convention on Biological Diversity (CBD) and the TRIPs agreement (i.e. a *sui generis* system of protection in terms of Article 27(3)(b) of the TRIPs Agreement). In this regard alternative systems of protection are evaluated and recommendations made but no attempt is made to develop a new system.

⁶ TRIPs-The World Trade Organization Agreement on Trade Related Aspects of Intellectual Property Rights (1994)

CBD-The United Nations Convention on Biological Diversity (1993)

UPOV-The International Union for the Protection of New Varieties of Plants (1978 and 1991)

1.3 METHODOLOGY

1.3.1 RESEARCH PROBLEM AND SUB PROBLEMS

The research question of this study is: To what extent does the current intellectual property system act to protect traditional ethnobotanical knowledge systems relevant to agricultural trade in the Western Cape?

The assumption underlying this study is that the current intellectual property system has been designed to serve commercial interests and therefore fails to adequately provide for the protection of traditional knowledge systems. It is therefore necessary to review the current system and develop new systems of protection. Following from this and the research question several sub-problems for investigation have been identified:

- i. What is the nature and value of traditional knowledge and what are the threats to traditional knowledge?
- ii. What is the origin, and nature of intellectual property rights and how do they apply in the global trading system?
- iii. What is the extent of protection IPRs can offer traditional knowledge holders?
- iv. What are the implications for the Western Cape?

1.3.2 THEORIES AND REFERENCES

Although limited to an economic analysis the very nature of the study necessitates an investigation into the legal system governing intellectual property. This study is therefore interested in identifying and analysing the fundamental economic and legal processes inherent in the relationship between intellectual property protection and traditional knowledge. In order to understand and investigate this legal-economic nexus the research is divided into components that are analysed using several approaches, the most important being institutional economics and legal philosophy. The choice of institutional economics as a framework for analysis lies in the nature of its application across subject fields. This allows for widening the scope of the study to include an analysis of the intellectual property law as an institution regulating the behaviour of economic agents as well as allowing for incorporating a legal analysis into the study.

Kasper and Streit (1998: 30) provide useful insight into the nature of institutional economics:

Human interactions, including those in economic life, depend on some sort of trust which is based on an order that is facilitated by rules banning unpredictable and opportunistic behaviour. We call these rules 'institutions'.

Institutional economics covers a two-way relationship between economics and institutions. It is concerned with the effect of institutions on the economy as well as the development of institutions in response to economic experiences.

Traditional neoclassical economics contains, as one of its central tenets, the principle of individualism in which the basic economic actor is the individual, as opposed to groups. This individual is assumed to base his action on rational thought (even if such rationality is bounded) with the aim of maximising his utility. These assumptions allow neoclassical economists to predict and model individual responses and to aggregate those responses to explain economy wide behaviour (Vandenberg 1998:9). Individuals are also assumed to act in an environment of incentives that rests largely on the role of relative prices. It can thus be assumed that when a rational individual acting to maximise his utility is confronted with a choice between two goods of comparable quality he would choose the one with the lower price. Furthermore, relative prices play a vital role in ensuring that markets clear by ensuring that the demand and supply of goods are equated. In this way prices, working through the market, ensures that the economy is at or moving toward a long run equilibrium, which represents an optimally efficient situation (Vandenberg 1998:9).

However, recognising that prices do not act as the only economic incentives, institutional analysis allows for evaluating the role of other incentives (strong property rights) as well as extending the investigation to governance structures (legislation). Institutional economics also differs from the neoclassical approach on the basis that within such a rational functioning of markets and individual action, inadequate attention is given to historical and cultural processes and the roles of power and coercion in the operation of markets. Neoclassical economics is therefore criticized for avoiding or denying the importance of institutions in economic analysis (Vandenberg 1998:10).

The importance of focussing on institutions in economic analysis is emphasised by North (1990:6): *"In a world of uncertainty they (institutions) have been used by human*

beings in an attempt to structure human interaction. They are the rules of the game of a society and in consequence provide the framework of incentives that shape economic, political, and social organisation. Institutions are composed of formal rules (laws, constitutions, rules), informal constraints (conventions, codes of conduct, norms of behaviour), and the effectiveness of their enforcement. Enforcement is carried out by third parties (law enforcement, social ostracism), by second parties (retaliation), or by the first party (self imposed codes of conduct). Institutions affect economic performance by determining, together with the technology employed, the transaction and transformation (production) costs that make up the total costs of production. Because there is an intimate connection between the institutions and technology employed, the efficiency of a market is directly shaped by the institutional framework”.

It is important to note that within the field of economics there exist two branches of institutionalism. Vandenberg (1998:2) points out that these include ‘new institutional economics (NIE) and ‘alternative institutional economics’ (AIE)⁷ and explains the distinction between them. NIE is founded on the contribution of Ronald Coase and is based on neoclassical principles of rational and maximising behaviour whereas AIE draws its inspiration from a critique of neoclassical principles, focuses more on historical structure and evolutionary change and draws its inspiration from writers such as Veblen, Commons and Ayres whose work is often termed ‘old institutional economics’ (OIE)⁸. Rutherford (1996) argues that although these branches differ significantly in philosophical and methodological orientation, as well as in theoretical direction and normative predilection, these differences are not dichotomous and irreconcilable. He claims that the differences between the two relate to matters of emphasis and focus and this allows for the possibility that some of the contributions of each might be complementary in nature and might indicate different aspects of a problem that should be incorporated in a more complete treatment. Rutherford (1996:x) explains “ It is a part of my argument that any adequate treatment of institutions cannot ignore points made by each, and that neither approach has a monopoly over the good or the interesting”.

⁷ Vandenberg (1998) uses the term ‘alternative institutional economics’ to highlight the different branches within institutionalism. In contrast to NIE the term AIE is not generally used to describe this branch of institutionalism. For the purposes of this study this distinction proves valuable and will be employed.

⁸ Vandenberg (1998) identifies leading writers within each branch as, Alchian; Demsetz; Williamson and North –(NIE), Samuels; Rutherford; Hodgson and Lazonick –(AIE)

The institutional framework that is employed in this study therefore draws on both AIE and NIE since both schools of thought adopt a holistic approach to economic analysis with emphasis not only on the economy and institutions at a point in time but also with their evolution. In this study particular emphasis is placed on the AIE work of Samuels on law and economics and the NIE work of North on institutions and institutional analysis as well as the property rights work of Demsetz and Arrow.

North's approach to institutional analysis serves as a valuable tool for the purposes of this study, given that the emphasis of this analysis is on institutions and the interaction between institutions and organisations (North 1990:5). This approach is well suited to this study, which seeks to provide an analysis of intellectual property protection and traditional knowledge as institutions regulating and determining the behaviour of economic actors. The distinction between institutions and organisations can best be explained by North's assertion that what must be clearly differentiated is the 'rules from the players' (North 1990:4). Employing this conceptual framework for differentiating between them, institutions can be understood to represent the underlying rules of the game (for the purposes of this study that is, the existing legislation and cultural norms regulating intellectual property and traditional knowledge), whilst organisations represent the players who seek to win the game whilst acting within the set of rules (i.e. communities that hold knowledge, enterprises seeking to exploit the knowledge)(North 1990:5).

The emphasis on the role of transaction costs within institutional economics and their close relationship with property rights also prove valuable for the analysis conducted in this study. The concept of transaction costs can be explained as the costs of specifying what is being exchanged and enforcing the subsequent agreement (Vandenberg 1998:6). For the purposes of this study the two aspects of transactions costs are especially relevant, Vandenberg (1998:7) explains that the enforcement and specification aspects of transaction costs are related but distinct. Enforcement costs rely either on a set of informal constraints such as traditional norms or on a set of legally enforced rights. Vandenberg explains that specification costs are more difficult to define since they involve measuring what is being exchanged. The concept of specification costs proves particularly relevant in the discussion on shared ownership as is the case with most forms of traditional knowledge and what exactly is being traded in the context of traditional knowledge⁹. Institutional economics and in particular North

⁹ Chapters two and three contain a detailed discussion on this issue.

use this concept of transaction cost as a basis for criticism against neoclassical economics, which assumes transaction costs to be zero.

According to Samuels and Schmid (1981:1) the aim of their work on law and economics is to “identify the instrumental variables and fundamental issues and processes- in the operation of legal institutions of economic significance.” The most important aspect of this approach to institutional analysis lies in their conceptualising of government and law. Samuels and Schmid (1981:1) explain “Government –the law- is (1) an institution available for the use of whoever can control it; (2) an arena of power and power play;(3) an important part of the larger social decision-making and valuation process; and (4) both an independent and dependent variable, the former insofar as other persons, groups, and institutions are law takers, the latter insofar as others can secure control of and use government as law makers.” Government is thus viewed as an object of legal control and the law is seen as an instrument of securing economic gain and advantage (Samuels and Schmid 1981:1) The importance of this conceptualisation of law and government is especially valuable for the purposes of this study given that the debate surrounding the protection of traditional knowledge involves not only the traditional communities but also those seeking to commercialise and exploit this knowledge and government and the law which serves as a handle or mechanism for ensuring a balancing of the interests of the different parties (the law acts as the primary governance mechanism structuring relations). Samuels and Schmid (1981:3) also introduce the important concepts of power and choice, selective perception, interdependence, and evolution. These concepts, power in particular, prove especially useful in analysing intellectual property regulation and its relationship to traditional knowledge. Their focus on the study of “processes whereby private decision-making is organised and structured, in large part through the institution of property” (Samuels and Schmid (1981:3)) also provides a valuable link to the work of North.

Property theories are also introduced. These include the Utilitarian and Natural Rights theories of property (Fisher 2001). These theories are then investigated in terms of the economic theory of property rights, which is founded on the claim that the history of property is the history of increasingly efficient solutions to the problem of economic efficiency (Ryan 1987:103). This is done in an attempt to provide an economic analysis of the justification of intellectual property rights, which is essential in understanding the rationale for seeking protection for knowledge. Existing forms of protection are also

introduced and investigated with an emphasis on the extent to which they provide for the protection of traditional knowledge. This is achieved by introducing traditional knowledge, investigating the economic value of traditional knowledge and determining the relationship between intellectual property and traditional knowledge.

Other references that will be employed in this study include the World Trade Organisation's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), The United Nations Convention on Biological Diversity (CBD), South African immaterial property legislation and the intellectual property protection systems of selected WTO members. Extensive use will also be made of resources, particularly research, conference and working papers, available through the World Intellectual Property Organisation (WIPO), The United Nations Food and Agricultural Organisation (FAO), The United Nations Conference on Trade and Development (UNCTAD), the World Bank, national and local government departments, universities and other relevant organisations.

1.4 SUBJECT OF COMPARATIVE STUDY

The comparative study included as a component of the broader study relates to the analysis of the intellectual property protection for a traditional South African medicinal plant that is found in the Western Cape. The choice of plant, the *Sutherlandia Frutescens* or 'Cancer Bush'¹⁰ is largely motivated by the availability of information and the fact that the plant is indigenous to Southern Africa. The *Sutherlandia* information site reports "*Sutherlandia Frutescens* is regarded as the most profound and multi-purpose of the medicinal plants in Southern Africa. Because of its efficacy as a safe tonic for diverse health conditions it has enjoyed a long history of use by all cultures in Southern Africa".

Other factors motivating this choice include:

- The extensive use of the plant, for its medicinal properties; by a significant number of traditional communities in the region. This serves to emphasize the problems of identifying ownership, which has significant implications for the assigning of intellectual property rights.

¹⁰ Sutherlandia.org identifies the following common names that have been used for *Sutherlandia* in South Africa: *Sutherlandia* (Botanical); Cancerbush (English); Kankerbos, Wildekeer, Rooikeurtjie, Kalkoenbos, Belbos, Gansies (Afrikaans); Unwele; Insiswa (Zulu); Musa-Pelo, Motlepele and Phethola (Sotho).

- The status the *Sutherlandia* has achieved through publicity identifying it as a potential herbal treatment for Aids patients (The Daily Dispatch (2001), The Cape Argus-(Campbell 2001), BBC News- (Dempster 2001), New Scientist (2001)).
- The economic, social and trade potential of the plant if found to be an effective treatment.
- The absence of a current intellectual property dispute over the plant allows for developing arguments along theoretical lines and extending such arguments to traditional knowledge in general.
- The chemical composition of the plant has been identified and studied, which facilitates an analysis of the protection afforded to the individual compounds as contrasted with the protection afforded to the entire plant. This is significant for identifying and explaining the threat posed by bio prospectors as in the Hoodia case. This also allows for evaluating the extent to which intellectual property can act as a threat to traditional knowledge.

This aspect of this study is only intended to test the applicability of IPRs to traditional knowledge of a plant in the region. This analysis is thus not an in depth analysis of the traditional knowledge of the plant itself. The plant is merely used as a proxy to highlight the complexities of applying IPRs to traditional knowledge in the region.

1.5 RESEARCH STRATEGIES

The methodology used for this study is a combination of techniques with an emphasis on analysis. In Chapter Two traditional knowledge systems are analysed. This is done by describing the social and economic value of traditional knowledge systems and identifying threats to traditional knowledge. The general nature of traditional knowledge as well as the management and practices of traditional communities is also investigated and described. The need for protection is then evaluated, including an analysis of the CBD agreement.

Chapter Three reviews IPRs by introducing intellectual property as an institution. This is done by introducing theories of property and analysing the economic justification for the existence of intellectual property. This chapter also outlines the development of the intellectual property system in global trade, and describes relevant intellectual property concepts such as patents, trademarks and geographical indications. The relationship

between intellectual property and traditional knowledge is then described with reference to both the TRIPs agreement and the CBD.

In Chapter Four existing intellectual property rights systems and the protection they are able to provide to traditional knowledge in South Africa is investigated. In this chapter the intellectual property protection of a traditional South African medicinal plant found in the Western Cape, the cancer bush or *Sutherlandia Frutescens*, is examined. Relevant IP legislation is applied to the traditional knowledge of the plant to determine the extent of protection these mechanisms provide. Chapter Five introduces several alternative systems of protection. This is done to identify the extent and effectiveness of different forms of protection; alternative systems are then contrasted with the prevailing IPR system in an attempt to determine the extent of protection provided by these rights. The results of the analysis are then interpreted with specific reference to the implications they hold for traditional knowledge in the Western Cape.

A summary of the results of the analysis, conclusions based on the research findings and recommendations for further research follow in Chapter Six

CHAPTER TWO

TRADITIONAL KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

If nature has made one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of everyone.

[Thomas Jefferson]

2.1 INTRODUCTION

The need to protect traditional knowledge is increasingly being realised as traditional knowledge and associated practices are recognised as having an essential role to play in environmental management and the promotion of sustainable development. The increased use of and search for commercially profitable substances among the ecosystems of indigenous communities underlines the value of traditional knowledge and resources. Recognising the value of traditional knowledge brings to the fore the issue of protecting it and ensuring that the holders of this knowledge are compensated for their contribution to the development of commercially traded products.

In 1993 the United Nations (UN) recognised the value of traditional knowledge when it declared ‘the international year for the worlds indigenous peoples’. The Rio¹¹ Declaration of the Convention on Biological Diversity (CBD) and most recently the Johannesburg¹² Declaration further reinforced the need to protect and promote the interests of indigenous and traditional communities and their practices, but still no single treaty on the protection of traditional knowledge exists.

This chapter analyses traditional knowledge systems and the institutions that regulate the access to and use of traditional knowledge and associated resources. Traditional ethnobotanical knowledge is defined and the economic value of traditional knowledge systems is discussed. The next section examines traditional knowledge as an institution by identifying and examining the characteristics and the use of the knowledge as held by traditional communities. The threat to traditional knowledge is then explained. This

¹¹ World Summit on Sustainable Development, Rio de Janeiro, Brazil 1992

¹² World Summit on Sustainable Development, Johannesburg, South Africa 2002

is followed by a discussion on the protection of traditional knowledge, which is undertaken within the framework of international regulation as contained in the TRIPs agreement and the CBD.

2.2 UNDERSTANDING TRADITIONAL KNOWLEDGE

2.2.1 DEFINING TRADITIONAL KNOWLEDGE

In order to investigate the protection of traditional knowledge it is essential to understand what the concept traditional knowledge encompasses and the manner in which it manifests itself. Buchner (2002) asserts that it is the lack of a universally accepted definition of traditional knowledge together with the lack of defined parameters for its protection that remains a major obstacle to the protection of traditional knowledge. Although this research focuses on a single aspect of traditional knowledge (i.e. ethnobotanical knowledge) and thus traditional knowledge in a narrow sense, it remains necessary to describe it in broader terms. This is because the reference to traditional knowledge as a concept in most of the literature refers to a wide variety of knowledge and practices of traditional communities.

The WIPO Secretariat uses the following all-encompassing and working concept of traditional knowledge¹³:

Traditional knowledge...refer[s] to tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names, symbols; undisclosed information; and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields. "traditional based" refers to knowledge systems, creations, innovations and cultural expressions which: have generally been transmitted from generation to generation; are generally regarded as pertaining to a particular people or its territory; and are constantly evolving in response to a changing environment. Categories of traditional knowledge could include: agricultural knowledge; scientific knowledge; technical knowledge; ecological knowledge; medicinal knowledge, including related medicines and remedies; biodiversity-related knowledge; traditional cultural expressions (expressions of folklore) in the form of music, dance, song, handicrafts, designs, stories, and artwork; elements of languages, such as names, geographical indications and symbols; and, movable cultural properties.

¹³ <http://www.wipo.int/globalissues/glossary/index.html> (09/11/2002).

This description of traditional knowledge excludes items in the scientific, industrial, literary or artistic fields that do not result from intellectual activity. Examples of these include human remains, languages in general and other similar elements of 'heritage' in the broad sense (WIPO: 2003). A UNDP (2003) report cites a 1996 Four Councils Document, which explains that what makes traditional knowledge 'traditional' "is not antiquity but the way it is acquired and used. In other words, the social process of learning and sharing knowledge, which is unique to each...[traditional] culture, lies at the heart of its traditionality".

In terms of the above description, ethnobotanical knowledge is included in the category of medicinal knowledge. Due to legal and policy issues that arise in traditional knowledge discussions it is important to note that a distinction exists between traditional cultural expressions and expressions of folklore, and, technical forms of traditional knowledge and traditional know-how. Ethnobotanical knowledge falls into this latter category and refers specifically to the know-how required to identify, locate, and use wild plants for medicinal, industrial and other practical purposes (Toffel 2002). Unless otherwise indicated all references to traditional knowledge in this study refer to ethnobotanical knowledge as defined here.

2.2.2 THE VALUE OF TRADITIONAL ETHNOBOTANICAL KNOWLEDGE

The history of mankind is the history of knowledge being transmitted from generation to generation. Hoppers (2002:2) suggests that as "...the world stands at a crossroad in search of new, human-centered visions of development in health, in preserving and conserving biodiversity, in human rights, and in the alleviation of poverty," development agencies and programmes are increasingly promoting the paradigm of sustainable development that builds on the knowledge resources that exist in communities. The renewed attention afforded to the integration of traditional knowledge systems recognises the value of these systems in achieving goals of transformation and sustainable development.

Traditional knowledge has played and continues to play an important role in the lives of the vast majority of people. Traditional knowledge is essential to both the food security and health needs of millions of people in the developing world. The Commission on Intellectual Property Rights (CIPR 2002) estimates that up to 80% of the population in developing countries rely on traditional medicines as it provides the

only affordable treatment available to poor people to help them meet their healthcare needs. Tansey (2000:16) states that the major social and economic value of traditional knowledge is in:

- Providing the livelihoods of millions of people;
- The types of farming it supports;
- Its maintenance and development of *in situ* biodiversity;
- In the knowledge of how to produce from low inputs sustainably in a wide variety of environments.

For many years traditional and indigenous communities were considered a hindrance to the economic development of a country. As countries pursued the goal of industrial development the traditional practices of communities were often ignored and sacrificed in pursuit of the goal of economic growth. The realisation that economic development and economic growth are not synonymous, coupled with the emergence of the idea of sustainable development (i.e. development that meets present needs without compromising the options of future generations), brought development and the environment into one logical framework. Recognising the significance of indigenous people's holistic knowledge of their environment and management of natural resources served to provide an "ideological bridge between the traditional and the modern sectors." (UNDP 2003:1).

In an African context the rich and largely unexplored biodiversity of the continent has resulted in an explosion in interest from the pharmaceutical industry. This interest provides a valuable opportunity for Africa to promote sustainable growth and development. Biological resources are rapidly becoming as valuable a resource for African development as mining and agriculture have traditionally been. In a Southern African context characterised by erratic rainfall with the majority of people living in rural areas and the main source of income generated by rain-fed arable and livestock production with low input-low output technology, biological opportunities present a real opportunity for these communities to supplement their income and drive development (Le Breton 2001).

Le Breton (2001: 2) provides the following data on trade in informal medicinal plants to highlight the value of trade in biological resources in the region:

- In South Africa as a nation, some 19500 tonnes are traded on the informal market per year, valued at \$35 million. The secondary users associated with this

trade in turn generate some \$280 million from the resale of these plant materials;

- The SADC regional market consumes over 50000 tonnes of medicinal plant material a year, and its 450000 dispensing healers are generating a minimum of \$700 million from the trade;
- In 1996, Europe imported 26500 tonnes of medicinal plant material from Africa.

The value of traditional knowledge and the desire to protect it extends well beyond economic and profit motives and is deeply rooted in concerns of continued existence, cultural preservation and social recognition. Traditional knowledge not only provides a profit opportunity but, depending on their ability to harness their traditional knowledge for commercial benefit, many traditional and indigenous communities can use it to ensure long-term sustainable economic development. Traditional knowledge thus represents an important opportunity for traditional communities to uplift and empower themselves.

2.3 TRADITIONAL KNOWLEDGE AND PHARMACEUTICAL TRADE

Global trade in pharmaceutical products is estimated at \$400 billion. Pharmaceutical companies invest vast sums of capital in research and development (R&D) activities aimed at identifying compounds with potential commercial value. The existence of millions of compounds in plant varieties makes the potential to determine beneficial drugs phenomenal but at the same time raises the costs of searching and identifying those plants with potentially beneficial compounds (GRAIN and Kalpavriksh 2002).

The rich and largely unexplored biological resources in the Southern African region and particularly the Western Cape represents an attractive option for pharmaceutical companies seeking to find new products and new ingredients. Traditional knowledge of these products and ingredients holds enormous value for bio prospectors in the region. Table 2.1 shows some South African medicinal plants that yield valuable products.

Locating active compounds in plants involves locating active assays. Identifying active assays in natural plants requires time and resources and often involves expensive screening methods that offer no guarantee of success. Researchers are required to identify viable targets, prioritise those targets and develop information rich screens. Compounds with a better chance of being biologically active, either as a drug or as agro

compounds, then have to be recognised (a hit) and the nature of their useful application has to be determined (a lead)¹⁴. In addition to this a large variety of tests and toxicity examinations need to be conducted before the compound can be developed further (Cameron 2003)¹⁵.

Table 2.1 *South African medicinal plants and their industrial application.*

Plant	Products	Uses
Aspalathus linearis L.	Rooibos Tea, cosmetics	Health beverage, antispasmodic
Aloe ferox	Gel	Wound healing
Ballota africana L.	Bradu tincture	Antispasmodic, sedative
Cnicus benedictus L.	Powder	Appetite stimulant
Cyclopia intermedia Vent.	Honeybush Tea	
Elytropappus rhinocerotis Cass.	Tonic	Anti-inflammatory
Harpagophytum procumbens DC	Devils claw tablets, gel, ointment	Anti-arthritic, anti-rheumatic, analgesic, appetite stimulant
Hypericum perforatum L.	Capsules, ointment	Anti depressant, anti viral
Sutherlandia Frutescens	Tablets, alcoholic tincture	Anti diabetic, anti-viral
Xysmalobium undulatum	Root powder	Anti diarrhoeal

Adapted from: van Wyk, Oudsthoorn & Gericke (1997) and George and van Staden (2000)

Toffel (2002:6) identifies the “massor blind screening approach” as one of the processes used by pharmaceutical companies in their search for new products based on natural plants. This technique involves screening all species that can be collected in sufficient quantity to identify useful chemical structures. Toffel (2002) cites the CEO of Sandoz AG, a pharmaceutical and agrochemical company and predecessor to Novartis AG, as estimating that only one in five thousand substances examined is likely to prove safe and effective, with a representative of the pharmaceutical giant Merck estimating the chances of success as being twice as remote. The US National Cancer Institute is

¹⁴ A hit refers to identifying a useful medicinal compound in a plant and a lead refers to identifying a useful application of the compound

cited as estimating the odds of discovering anticancer compounds from screening efforts as one in fifty thousand.

With an estimated three quarters of the plant sources that provide prescription drug's active ingredients coming to the attention of researchers through their use in traditional medicine the value of traditional knowledge to the screening process is evident (Toffel 2002). Traditional knowledge of medicinal plants, their use and application allows researchers to narrow their search base and increases the probability of successful "hits and leads". This was shown in the case of the Hoodia Cactus where the traditional knowledge of the San community allowed researchers to identify and screen the plant without having to undergo the resource intensive and time-consuming process of screening thousands of other plants. In this instance the traditional knowledge of the San contributed to a 'hit'. In addition the traditional knowledge that recognised the plant as an appetite suppressant also gave rise to a 'lead'. Researchers isolated the appetite-suppressing compound and a product is being developed for its properties as an appetite suppressant. This is consistent with the traditional application of the plant.

Using traditional knowledge as an information source essentially provides researchers with a head start that is vital in the pharmaceutical market. A UNDP Civil Society Organisations and Participation Programme Report (UNDP 2003) goes as far as to claim that by consulting indigenous groups, bioprospectors can enhance the success rate of their screening for useful compounds to one in two. Toffel (2002:7) explains that the value traditional knowledge can bring to pharmaceutical companies derives not only from the fact that traditional communities possess the information on the medicinal properties of various species of plants, but "...also from their knowledge of the location of these species, the proper time for harvesting, the appropriate parts of the plant to use, and the best methods to store, prepare, and administer the medicine."

2.4 THE NATURE OF TRADITIONAL KNOWLEDGE

2.4.1 IDENTIFYING A COMMUNITY

Traditional knowledge by its very nature relates to knowledge held by a traditional community. Great diversity among and within communities makes it especially difficult to define and identify a specific community. Mudiwa (undated:8) explains that

¹⁵ Discussion with Denise Cameron, Researcher, University of Cape Town-South African Traditional Medicines Research Unit.

no one definition of what a community is exists. A community could be defined in a number of ways and on the basis of different factors. Some communities may be defined in terms of shared social and economic relationships, others in terms of shared values and customs. Communities may also be defined in terms of the transmission of knowledge, religious affiliation, and common language, or even on the basis of territory or access to a specific natural resource (Mudiwa: undated). Within South Africa the diaspora of communities makes the problem of identifying communities extremely difficult. To overcome this problem this study simplifies the identification of communities on the basis of linguistic fractionalisation in terms of the eleven officially recognised languages¹⁶, and in addition assumes that these communities share a common culture with common values and customs¹⁷.

This approach is not without problems and by no means adequately addresses the dynamics of groups that invariably exist within the larger community. This approach also excludes some communities whose languages are not officially recognised. However, it does prove useful in providing a workable framework for delineating communities along some determinable lines and serves the purpose of highlighting the difficulty of applying IPRs to the protection of traditional knowledge, even if attempted within a given geographic location (i.e. Western Cape).

2.4.2 THE CHARACTERISTICS OF TRADITIONAL KNOWLEDGE

The relationship between a particular community and its environment or biological resources differs from one to another. In a similar fashion the nature and use of traditional knowledge within different cultures varies. Kluckhohn (1962:25) defines culture as “ a shared set of commonly held body of beliefs and values which define and influence assumptions, perceptions and behaviour...[furthermore]...it (culture) is one of facet of human life. It is that part which is learned by people as a result of belonging to some particular group, and is that part of learned behaviour which is shared with others.” Different communities each possess unique cultural traits and as a result manage their knowledge resources in different ways. Different traditional and

¹⁶ The South African Constitution, 1996, provides for eleven official languages, these are, Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Sepedi, Sesotho, Setswana, siSwati, Tshivenda and Xitsonga.

¹⁷ This assumption in itself is problematic given that a wide range of communities with different values and customs share a common language. An example of this could be the Coloured and Afrikaner community who share Afrikaans as a language but differ in terms of customs. Similarly using a language such as English as a defining criterion ignores the multitude of different cultures that use English as a first language in South Africa.

indigenous communities each possess their own locally-specific systems of jurisprudence with respect to the classification of different types of knowledge, the procedures for acquiring and sharing knowledge, and the rights and responsibilities which attach to possessing knowledge. These systems are embedded in the culture and language of a community and are thus unique to a community.

Attempting to identify the unique characteristics of eleven communities in South Africa poses a significant challenge and is not attempted here. No generic form of customary regulations governing traditional knowledge exists but several generally applicable principles can be identified and introduced. These characteristics are not exhaustive and ignore many of the intricacies of traditional systems and as such are not intended to be representative of the totality of characteristics of traditional cultures, but merely to outline the informal constraints that could be considered generally applicable within and across traditional communities.

Traditional knowledge as it exists within traditional communities and for the purposes of this study¹⁸ can be characterised on the basis of the following:

(a) Ownership

Traditional knowledge is often described as being collectively derived and held (Halewood: 1999). This implies that knowledge belongs to the community as a group with no one individual possessing the knowledge to the exclusion of others even though specific individuals or groups within a community may hold certain types of traditional knowledge. In South Africa this may be represented by a 'sangoma'¹⁹ or traditional medicine man that possesses the traditional knowledge of medicinal plants. There do exist transaction costs associated with the knowledge held by a 'sangoma'. The community benefiting from the specialised knowledge may be required to provide some form of immediate payment to the 'sangoma' as compensation for the service received. The form and nature of this payment is often determined by the particular custom of a community²⁰. The transfer of a 'payment' to the 'sangoma' implies that the traditional knowledge falls into the realm of private property that is held by the 'sangoma'. However, the nature of traditional communities which is generally underpinned by a recognition of common property and the governance of information

¹⁸ The characteristics listed here represent those most relevant to a discussion on traditional knowledge and IPRs.

¹⁹ Other examples from various communities include; witchdoctors, shamans, sadus etc.

flows that this concept suggests that although individual recognition may be granted to a 'sangoma', the knowledge is held for the benefit of the community and not the individual. In addition the reputation and status of a 'sangoma' in traditional communities is dependant on the community he/she serves, opportunistic behaviour and rent seeking behaviour by such individuals is therefore constrained and traditional systems of information exchange are entrenched. Traditional knowledge can therefore be considered as being collectively held.

Knowledge is also derived collectively, which implies that all contributions to knowledge could be considered to be a communal contribution with no one individual merited for the advancement of the knowledge. This implies that no one individual can claim ownership over such knowledge. The concepts of individual ownership and private property are generally not applicable to traditional societies (UNCTAD 2000) and as a result traditional knowledge, even if held by an individual within a society, is considered the property of the entire society. In economic terms traditional knowledge can be considered as a public good, in that is non excludable and non rivalrous in nature. Traditional knowledge resides in the intellectual commons and exists for the benefit of the community who act as custodians of the knowledge for future generations.

(b) Access and Use

The access to and use of traditional knowledge within and outside communities is usually governed by a wide variety of customary laws. As with ownership, no generic system of proprietary rights exist across all communities but most traditional communities share the belief that products of nature are the common heritage of mankind and as a result should be available to all. This does not imply that communities do not claim rights over such knowledge, but unlike the Western conception of property rights that have an axiomatic link to ownership, the rights of communities to traditional knowledge are often rights and responsibilities associated with their role as custodians and stewards of such knowledge.

²⁰ Payment may take the form of monetary compensation and /or gifts.

(c) Relationship to Environment

Traditional knowledge is generally described as being closely related to the environment. Halewood (1999:957) describes traditional knowledge as being embedded in and “inextricably linked to the land...[furthermore]...as an amalgam of interrelated spiritual, practical, and innovative practices, all of which revolve around reverence for the land and the land’s sustainable use.” This close connection between traditional communities and their environments stems from the communities’ reliance on their environment for their survival, given that most traditional communities are agrarian and practice subsistence farming. In addition, relying on the land and the environment as a resource for food and medicine results in these communities viewing the land as sacred and vital to the preservation of their cultures and lifestyles.

(d) Evolution and Duration

Traditional knowledge is not time limited. Traditional communities do not consider knowledge as being created at a specific point in time and being valuable for a limited duration. Rather than being static, knowledge creation in traditional communities is dynamic. Traditional knowledge evolves over time as communities respond to new challenges and needs. Traditional knowledge is passed down from generation to generation and adapted and improved upon with the passing of time. Traditional knowledge is therefore not held for a specific period of time but is held in perpetuity by the communities who acquire and inherit the knowledge. Traditional knowledge can thus be viewed as being ‘intergenerational’ in nature (Toffel 2002).

(e) Transmission

Although some traditional knowledge is documented and transmitted in written form, the transmission of traditional knowledge generally tends to take place orally from generation to generation (Halewood 1999). Traditional knowledge is also often tacit knowledge implying that it is not transmitted through documentation. As a result and unless otherwise indicated, this study proceeds on the assumption that most traditional knowledge is undocumented.

2.5 THE THREAT TO TRADITIONAL KNOWLEDGE

The protection of traditional knowledge and innovations of traditional communities has been receiving increasing attention on the international agenda. Access to the resources of traditional communities and the traditional knowledge of these communities has the potential to provide substantial benefits to companies and scientific researchers in both developing and developed countries (Wynberg and Jardine 2000). However, the concern does exist that traditional knowledge is at risk of being unfairly appropriated, adapted and patented by industries in developed countries with no compensation to the holders of this knowledge and without their consent.

Biopiracy is the greatest threat facing traditional communities who possess traditional knowledge on medicinal plants. Although no generally accepted definition of biopiracy exists the CIPR definition provided in chapter one²¹ does provide an insight into the nature of biopiracy. Based on this definition the CIPR describes the following as biopiracy:

- The granting of ‘wrong’ patents: this relates to inventions or innovations that do not meet patent requirements because of their existence as traditional knowledge;
- The granting of “right” patents: This refers to inventions or innovations that meet patent requirements even though they are based on traditional knowledge. The granting of ‘right’ patents could be seen to constitute biopiracy because patenting standards are too low and/or no arrangements are made with traditional communities for benefit sharing.

In this regard it is important to note that it is often the use of existing IPRs (patents) by parties wishing to commercialise traditional knowledge that acts as the threat to traditional knowledge (Box 2.1. provides several examples of this threat). This often raises the concern regarding not only whether the same tool that acts as a threat to traditional knowledge could be used to protect it but also whether it should be used to protect traditional knowledge. WIPO (2003(a)) reports that with regard to plant varieties in South Africa, 223 applications for registration were filed in 2001. Of these only 75 represent applications by South African residents. In addition, a further 166 registrations were effected during this period, with only 39 of these effected in the name of South African residents.

²¹ Chapter 1, pg. 1.

Box 2.1 *The Threat of Biopiracy***The Tumeric Patent**

Tumeric is a plant of the ginger family often used as spice for flavouring in Indian cooking. The Tumeric plant also has properties that make it an effective ingredient in medicines, cosmetics and as a colour dye. As a medicine it is traditionally used in the treatment of wounds and rashes. In 1993 a patent application for the 'use of Tumeric in wound healing' was filed in the US. This application was filed by two Indian nationals (Das, S.K. & Cohly, H.H.P) with the assignee being the University of Mississippi Medical Centre. In 1995 the patent on Tumeric was granted (US patent no. 5401504). The CIPR reports that the Indian Council for Scientific and Industrial Research (CSIR) requested that the patent be re-examined on the basis that Tumeric has been used for thousands of years in healing wounds and rashes. The patent was subsequently revoked.

The Tumeric case represents a landmark since it was the first instance in which a patent based on the traditional knowledge of a developing country was successfully challenged. However, it should be noted that the CSIR challenge was supported by documentary evidence of the traditional knowledge, including an ancient Sanskrit text and a 1953 paper in the Journal of the Indian Medical Association (CIPR 2002). This evidence was essential in challenging the patent on the grounds of it not being novel.

The Ayahuasca Case

Ayahuasca (meaning 'vine of the soul') is a ceremonial drink that is produced from the bark of the *Banisteriopsis caapi* tree, which occurs in the Amazon Basin. The CIPR (2002) states that shamans of indigenous tribes throughout the Amazon Basin have been producing this drink for generations, which is used in religious and healing ceremonies.

In 1984 Loren Miller of Palo Alto, California filed a patent application for an allegedly new and distinct variety of '*Banisteriopsis caapi*', which he called 'Da Vine'. Miller's application characterises the plant on the basis of its colour (rose colour) and medicinal properties. In 1994 the Coordinating Body of Indigenous Organisations of the Amazon Basin (COICA) learned of the patent and with the help of the Centre for International Environmental Law (CIEL) challenged the patent. In November 1999 the USPTO

rejected the patent claim, agreeing with the CIEL that 'Da Vine' was not distinguishable from the prior art (i.e. the use of the *Banisteriopsis caapi* by indigenous tribes of the Amazon Basin) represented by the CIEL and should not have been patented. However, as the CIPR (2002) reports, in 2001 for reasons unknown the USPTO announced that the patent should stand.

The Neem Patent

The Neem tree occurs in India and other parts of South and South East Asia. For centuries Indian farmers have scattered the seed of particular species of Neem on the fields as a pesticide. Neem provides a cheap and environmentally friendly alternative to pesticides produced by commercial enterprises. In addition, the oil extracted from the Neem seeds is traditionally used to treat colds and flu and can be used to treat malaria and skin diseases.

The active chemical (*azadirachtin*) was extracted and modified. Two companies, W.R. Grace and Agrodyne, obtained patents for the active ingredient in the Neem seeds even though their properties are not new and have been known for generations to Indian farmers. In 1994 W.R. Grace was granted a European patent (no. 0436257) based on the extracted Neem oil. In 1995 NGO's representing Indian farmers challenged this patent and in 2000 the European Patent Office revoked the patent.

A search of the USPTO database reveals that several patents based on '*azadirachta indica*' exist and have been recently granted. In June 2003, Sumitomo Chemical Company was

granted a patent for 'solid pesticidal formulation' and in August 2003 a German company was granted a patent based on this compound for an agrochemical formulation (patent no. 6602823). Other patents include pesticidal applications and medicinal applications of the compound.

The Endod Plant

The Endod plant is an Ethiopian plant that is more commonly referred to as the Ethiopian soapberry plant. This plant is grown mainly for its use as a detergent. Laurie (1997) reports that in 1964 it was discovered that snails carrying the fluke that caused

schistosomiasis (more commonly referred to as snail fever, liver fluke or bilharzia) were killed in the streams where people washed their clothing using the Endod plant. This scourge is widespread in tropical Africa and poses a problem wherever people work in water (Landes 1998:8). The death of the snails in the streams used by local inhabitants directed scientists at Addis Ababa University to research the potential of the plant as a low cost molluscicide. Researchers at the University of Toledo in U.S. discovered the active ingredient and named it '*lemmatoxin*'. The university subsequently filed and received a patent for this agent (patent no. 5334386). A search of the USPTO patents database revealed that three additional patents for the agent '*lemmatoxin*' were subsequently granted (patent no.: 5550157,5303781,5252330) for the use of the agent as a molluscicide in the controlling of zebra and dreissenidae mussels.

Despite the contribution of the Ethiopian people (both the communities and researchers at the university) to this discovery, no benefits from the exploitation of the patent have accrued to either of them.

Sources CIPR (2002), USPTO (patents database) and GRAIN (2000).

2.6 PROTECTING TRADITIONAL KNOWLEDGE

WIPO (2001) summarises the concerns of traditional knowledge holders as follows:

- Concern about the loss of traditional lifestyles and of traditional knowledge, and the reluctance of younger members of the communities to carry forward traditional practices;
- Concern about the loss of respect for traditional knowledge and holders of traditional knowledge;
- Concern about the misappropriation of traditional knowledge including use of traditional knowledge without any benefit sharing;
- Lack of recognition of the need to preserve and promote the further use of traditional knowledge.

Thus, there are a number of reasons for the protection and promotion of traditional knowledge. The erosion of traditional lifestyles and cultures through external pressures, promotion of its use for development purposes and protection against the threat of misappropriation are amongst the most important of these. These reasons are not

mutually exclusive and each has a bearing on the other. This study focuses on the threat of misappropriation (biopiracy), which if not guarded against poses significant constraints on the use of traditional knowledge for development purposes. Misappropriation in the context of this analysis focuses on two aspects of protection:

- Ownership: this includes the right to maintain the secrecy of traditional knowledge, use traditional knowledge to develop the community and most importantly the right to benefit from the commercialisation of their traditional knowledge;
- Control: this includes the right to approve or reject the commercial use of their traditional knowledge and the right to maintain the sacredness of their knowledge.

Although this analysis is limited to the above concerns it should be noted that protecting traditional knowledge is not limited to protecting the commercial value of such knowledge, but is inextricably linked to the protection of a wide range of rights relevant to the cultures and survival of traditional communities and practices. It should also be noted that the absence of protection might also act as a threat to traditional knowledge in that it may act as a disincentive for communities to further develop their knowledge and practices.

Several international agreements have important implications for the protection of traditional knowledge. These agreements are interrelated, in terms of the mechanisms of protection proposed, and are currently the only international agreements that make provision for the protection of traditional knowledge.

These agreements include:

- The Convention on Biological Diversity (CBD)
- The WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs)²²

The relationship between the objectives of the CBD and IPRs is the subject of continuing debate, as is the effect of the TRIPs agreement on achieving the objectives of the CBD. These agreements are introduced to highlight these issues and provide a context for further discussion on protecting traditional knowledge.

2.6.1 THE CBD AND TRADITIONAL KNOWLEDGE

Prior to 1992 the traditional knowledge and associated resources of communities was generally considered to be the ‘common heritage of mankind’. The absence of international and in most cases national laws regulating access to biological resources resulted in an increase in the commercial use of such resources and traditional knowledge. The resultant depletion of resources and the need to reward users and providers of knowledge gave rise to the CBD (World Bank 2000).

The 1993 Rio Summit provided the background for the document of the United Nations Convention on Biological Diversity (CBD). The agreement entered into force in December 1993 after a sufficient number of members ratified the agreement²³. The aims of the CBD are the “*conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies (Article 1)*”. Almost a decade later the CBD remains the only legally binding instrument that refers to the protection of traditional knowledge. In terms of article 8(j) the CBD calls for the protection and promotion of traditional knowledge, practices and innovations but it does not provide any explicit means by which national governments are required to draw up legislation to achieve this. A central reason for this is the fact that the CBD bases its approach on the premise of national sovereignty over biological diversity²⁴. Article 15 (1)²⁵ reinforces this: “*Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with national governments and is subject to national legislation.*” This indicates a recognition by parties to the convention that, given unique biological resources, developmental objectives and diversity of communities, national governments are best suited to determine the nature, the type and the extent of protection required for their unique circumstances. Article 15 also represented a salient shift in perceptions about traditional knowledge. Jerome (undated) makes the point that by recognising national sovereignty over natural resources the CBD directly challenged the concept of

²² TRIPs does not explicitly provide for protecting traditional knowledge but certain provisions may be interpreted and applied to traditional knowledge.

²³ South Africa signed the agreement on the 4 June 1993 and ratified the agreement on 11 December 1995. The agreement is thus legally binding on South Africa.

²⁴ CBD preamble – “Reaffirming that states have sovereign rights over their own biological resources.

²⁵ Article 15 of the CBD deals with access to genetic resources

‘common heritage’ and in so doing acknowledged the historical asymmetry of the flow of such resources.

In addition to requiring parties to respect, preserve and maintain traditional knowledge, Article 8(j) also emphasises the importance of equitable sharing of benefits that arise from the use of such knowledge. The mechanism that the CBD promotes to achieve this is the requirement that access to genetic resources must be obtained with ‘prior informed consent’ and on ‘mutually agreed terms’²⁶. Signatories are further required to encourage the use of traditional knowledge when the associated practices of that knowledge are compatible with conservation and sustainable resource utilisation (Article 10(c)). The thrust of the CBD as it relates to ethnobotanical traditional knowledge can thus be construed as being the inclusion of traditional communities as beneficiaries of innovations using their traditional knowledge to develop medicinal products. Traditional communities should also approve, be involved in developing, and benefit from any innovations using their traditional knowledge.

The Conference of Parties (COP) to the CBD recognised the special nature of agricultural biodiversity and its distinctive features and the problems associated with it. In so doing the CBD recognises the need for distinctive solutions. The broad and open language of the agreement, whilst giving freedom to parties to implement their own systems of protection does carry with it the cost of often being unclear and difficult to interpret. George and van Staden (2000:435) challenge the idea that that the agreement is an ‘honest broker’ and identify the following flaws in the agreement:

- The absence of royalties’ rights for genetic material and traditional knowledge that has already been exported. The rights conferred to source nation/s are therefore prospective only;
- Lack of legal pressure on host nations to share any compensation with traditional communities.

The failure by the United States to ratify the convention is another factor cited as indicative of the improbability of the convention achieving its stated objectives.

Although these criticisms do highlight flaws of the CBD it should be noted that multilateral agreements by their very nature are agreements between states and not between communities or individuals within those states and, although not complete or comprehensive in its coverage, the CBD does represent an important step in

²⁶ Article 15(4) and (5).

recognising the contributions of traditional communities and challenging the inequities that prevail in the trade in biological resources.

2.6.2 TRIPS AND TRADITIONAL KNOWLEDGE

A year after the CBD was entered into the TRIPs agreement was created. The TRIPs agreement is a General Agreement on Tariffs and Trade (GATT) agreement and is administered by the WTO. It is the first and only international treaty that establishes enforceable universal minimum standards for the protection of IPRs and requires members to conform to industrialized country standards of IP protection (Lewanika 2001, May 2000). The implications of the TRIPs for South Africa is that as a member South Africa is required to amend its IP legislation in line with the provisions of the TRIPs.

Within the WTO the relationship between the CBD and its provisions on traditional knowledge and the TRIPs agreement has been discussed in both the TRIPs council and the Committee on Trade and Environment (Sharma: 2003). The TRIPs agreement makes no explicit mention regarding the protection of traditional knowledge nor does it make reference to the CBD. Given this and as table 4.1²⁷ outlines, different categories of IPRs are applicable to different activities; the category that dominates the discussion on traditional knowledge within TRIPs is patents and the protection of plant varieties (Buchner 2002). The importance of Article 27 of the TRIPs for traditional knowledge is that it requires members to make patents available for all inventions, whether products or processes, in all fields of technology without discrimination (Article 27(1)). However, this Article does provide for exceptions to this basic rule and it is within this exception that discussion on traditional knowledge takes place. Article 27 (3)(b) of the agreement states that:

Members may exclude from patentability: plants and animals other than microorganisms, and essentially biological processes for the production of plants and animals other than non-biological and microbiological processes. However, members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof....

The importance of article 27(3)(b) for traditional knowledge stems from the requirement that countries need to introduce protection for microorganisms,

²⁷ Chapter 4, table 4.1, pg. 71.

microbiological processes and plant varieties. The basis for discussion on protecting traditional knowledge within the framework of the TRIPs therefore tends to take place within the ambit of this provision. It is important to note that the TRIPs agreement is a legal text and as such is subject to interpretation. The terms used in the above article are not defined in the agreement and are therefore open to interpretation²⁸, which can and as the literature and discussions reveal, often does lead to legal arguments over their precise meaning.

The lack of clarity of definitions poses significant challenges for countries not wishing to patent plants or essentially biological processes. Distinguishing between an essentially biological process and a microbiological process is often a matter of definition. These words, along with those identified by Dhar, are often defined differently in different international and national legislation. In addition, requiring patents on microorganisms allows for patenting of compounds or active ingredients found in plants, which often provides the basis of biopiracy, which represents the threat faced by traditional communities. This is especially relevant when the patenting of the microorganism or active compound of a specific plant essentially amounts to a 'patenting of the entire plant'. What is meant by this is that if a plant serves a specific purpose or the value of that plant to a community lies in its specific application as a medicine, the patenting of the active compound essentially patents the entire value of the plant²⁹ and could be considered an appropriation of the plant itself (even though the plant itself is not subject to a patent).

The value of discussing traditional knowledge within the WTO framework is enhanced by the legal structure of the organisation. In contrast to the CBD, the TRIPs agreement contains a credible and authoritative enforcement mechanism. The WTO Dispute Settlement Unit (DSU) creates a binding dispute settlement mechanism. Non-compliance with provisions carries with it the threat of other member countries lodging a complaint against the transgressing member at the WTO dispute settlement body

²⁸ Dhar as cited in Tansey (1999:7) identifies the following words as being open to interpretation:

- Plants
- Animals
- Micro-organisms
- Essentially biological processes
- Non-biological
- Microbiological
- Plant varieties
- Effective, and
- *Sui generis* system

²⁹ Personal discussion, Johnna Montgomerie.

(WTO 1999). A ruling against a member is binding and failure to abide by the decision of the Dispute Settlement Unit authorises the complaining party to impose trade sanctions against the other party. Monagle and Gonzales (2001:11) explain, “The existence of the dispute settlement mechanism is one factor that lends practical and political strength to the WTO agreements.”

This political strength is further reflected in the ability of the WTO to infringe on national sovereignty. Unlike the CBD, which encourages national sovereignty over bioresources, the TRIPs agreement and in particular the provisions of article 27(3)(b) restrict national sovereignty by requiring members to provide for a stated level of protection as set out in the agreement.

Member countries are limited to four options that are consistent with Article 27(3)(b). Tansey (1999: 7-8) interprets these as:

1. To allow patents on everything;
2. To exclude plants, animals and essentially biological processes from patenting but not to exclude plant varieties from patentability;
3. To exclude plants, animals and essentially biological processes from patenting and to introduce a *sui generis*³⁰ system of protection for plant varieties;
4. To exclude plants, animals and essentially biological processes from patenting but not plant varieties and to provide, in addition, a *sui generis*³¹ system of protection.

Options one and two implement patent protection for plant varieties and therefore do not require the development of a *sui generis* system of protection. Option 3 requires a *sui generis* system of protection for plant varieties whilst option four allows for using both patents and a *sui generis* system. Option four reflects the ‘any combination thereof’ option provided for. Using the existing categories of rights to protect traditional knowledge through the TRIPs agreement thus has the advantage of providing a guaranteed level of protection backed by the threat of retaliation in the event of non-compliance.

In addition, the importance of the TRIPs agreement as a mechanism for furthering the objectives of the CBD lies in its potential to address substantive issues relating to

³⁰ *Sui generis* is a Latin phrase meaning “of its own kind”.

³¹ The International Union for the Protection of new Varieties of Plants (UPOV) is often cited as an example of a *sui generis* system of protection for plant varieties.

ethical questions about patenting life forms, prior informed consent and benefit sharing and traditional knowledge. The inclusion of these issues for discussion is possible in terms of Article 71(1) of the TRIPs agreement, which makes provision for reviewing the agreement at regular intervals. Monagle and Gonzales (2001) argue that such a review should be directed toward examining whether the agreement is meeting its objectives and the broader WTO objectives including that of sustainable development. Monagle and Gonzales (2001) conclude that such a 'sustainability review' would ensure that the implementation of the IPR system required by the TRIPs agreement is supportive of, and not inconsistent with, the objectives of the CBD. The interpretation of and application of provisions on patenting and plant variety protection have important implications for implementing the CBD and protecting traditional knowledge. The manner in which rights are allocated in terms of the TRIPs agreement impacts on how the control over and benefits arising from the use of traditional knowledge and genetic resources are shared amongst relevant role players.

2.7 CONCLUSION

The broad scope of coverage of different types of traditional knowledge makes it especially difficult to provide a single all encompassing definition of what constitutes traditional knowledge. This lack of a clear definition contributes to the difficulty of providing protection for traditional knowledge since a working definition is necessary to determine what traditional knowledge is and what exactly needs to be protected. Focusing on a single category like ethnobotanical knowledge provides a narrower framework, thus limiting the scope of the analysis, and allows for a directed analysis. This facilitates a discussion on protecting traditional knowledge by providing clarity of the nature of the knowledge that is to be protected.

Traditional ethnobotanical knowledge as a category of traditional knowledge holds enormous economic and social value for communities that possess such knowledge, as well as for parties who seek to develop products based on such knowledge. This is particularly evident in the pharmaceutical, agricultural and cosmetic sectors, which are increasingly using traditional knowledge as a source of information in their search for natural compounds that can be developed into commercially traded products. The lack of protection for traditional knowledge often results in traditional communities not benefiting commercially from the exploitation and development of products based on their traditional knowledge. Providing protection to communities in the form of

recognising ownership and control over their traditional knowledge and resources allows communities to determine who gains access to their knowledge and the terms of such access.

However, an effective system of protection has to take cognisance of the nature of traditional knowledge and in so doing has to be suited to the cultural and traditional practices of such communities as regards their traditional knowledge. The unique cultures and practices of traditional communities contribute to the difficulty of developing uniform protection mechanisms. The CBD recognises this difficulty and does not provide a system of protection but rather, recognises national sovereignty, thereby promoting national discretion in developing a system suitable to specific needs of the community or country. The CBD also signals an important international acknowledgement of the necessity of protecting traditional knowledge and granting communities rights over their knowledge. Although it does provide a system of protection the CBD does recognise the link between IPRs and traditional knowledge by recognising that such knowledge is the intellectual property of communities. IPRs therefore have an important bearing on the protection of traditional knowledge.

The TRIPs agreement and in particular Article 27(3)(b) of its patent provisions are therefore important as a vehicle for promoting the objectives of the CBD. As a WTO agreement the TRIPs places IPRs squarely in the realm of international trade. Protecting traditional knowledge is a broad issue relating to culture, religion, recognition, preservation and sustainable development. Using the TRIPs framework to promote CBD objectives of protecting and promoting traditional knowledge requires evaluating traditional knowledge as a trade issue. This necessitates an analysis of the nature of and features of traditional knowledge and IPRs as promoted by the TRIPs agreement.

CHAPTER THREE

AN ANALYSIS OF INTELLECTUAL PROPERTY RIGHTS AND THEIR DEVELOPMENT IN THE GLOBAL TRADING SYSTEM

Property institutions fundamentally shape society

Edwin C. Hettinger

All property is theft!

P.J. Proudhon

3.1 INTRODUCTION

Fuelled by technological advances, the role of intellectual property rights (IPRs) in international trade has grown considerably over the last three decades (Dutfield 2000). As with other property rights, IPRs deal with the relations between individuals, but unlike other property rights, IPRs relate to rights to abstract objects, the most important of which is knowledge (Gernholtz 1994 and May 2000). Intellectual property rights therefore act as a vital mechanism for allocating rights to knowledge. “Knowledge is critical for development, because everything we do depends on knowledge. For countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far toward the former that knowledge has become perhaps the most important factor determining the standard of living – more than land, than tools, than labour. Today’s most technologically advanced economies are truly knowledge based” (UNCTAD 2002:9). The importance of IPRs stems from the fact that they make it possible to control the commercial exploitation of scientific, technological and cultural creations, which is key to economic growth.

Accepting that IPRs have a role to play in protecting traditional knowledge leads to the question regarding what that role should be and to what extent can IPRs be used to protect traditional knowledge. In order to answer these questions it is necessary to first understand what exactly IPRs are and why they exist. This chapter provides an analysis of the institution of intellectual property and its development. Intellectual property as a concept is defined and the categories of intellectual property rights as contained in the

TRIPs agreement are introduced³². The legal construction of intellectual property is examined with a focus on the questions, what is intellectual property, why does it exist and who has the right to claim ownership of it. These questions are addressed by introducing relevant theories of property and examining the manner in which they are extended to include intellectual property. This section investigates the extent to which the prevailing concept of intellectual property rights is consistent with and may be justified by existing theories of property rights. Intellectual property is then examined in terms of economic theory. The economic rationale for the existence of IP is examined using neoclassical economic theory as well as an institutional approach. The next section provides a brief outline of the development of the existing global intellectual property system as represented by the TRIPs Agreement, and introduces the relevant categories of IPRs.

3.2 INTELLECTUAL PROPERTY AND INTERNATIONAL TRADE

The 1st of January 1995 heralded the beginning of a new era for international trade as the World Trade Organisation (WTO) was born following the successful conclusion of the Uruguay Round of trade negotiations and the ratification of the Marrakech Agreement by member countries. Although largely based on the General Agreement on Tariffs and Trade (GATT), which dated back to 1947, the establishment of this new international organisation signalled a significant move forward in the liberalization of international trade and the restructuring of the global trading system. For the first time in the history of global trade rules a formal multilateral organisation has been tasked with regulating the implementation and application of those rules (Thomas and Meyer 1997 and Bhandari 1998).

However, the evolution of the GATT to the WTO resulted in more than just the establishment of a formal multilateral organisation. This new organisation also served to deepen and widen the legal framework administered by its predecessor, GATT. The WTO extended its coverage to trade in services³³ and incorporated an agreement on the contentious area of agriculture³⁴. Wilkinson (2000:57) explains the manner in which the WTO also widened the parameters of international trade regulation: “The negotiation of the Agreement on Trade Related Aspects of Intellectual Property Rights

³² The categories of IPRs are merely introduced to facilitate the discussion that follows, greater detail of all relevant IPRs for the study is provided later.

³³ General Agreement on Trade in Services-GATS

³⁴ Agreement on Agriculture-AoA

(TRIPs) and the Agreement on Trade Related Investment Measures (TRIMs) has taken this regulation beyond the traditional parameters of trade into areas deemed to be trade related - areas which, though not bearing tradable commodities, are deemed essential to the production process.”

Advances in the fields of communication, information processing and biotechnology have brought with them the need for greater intellectual property rights protection. Large corporations operating across a wide range of sectors not only employ these technologies, but also are often responsible for the development of such technologies. Firms thus seek intellectual property rights protection for their products and technologies so as to maximise returns from their often-sizeable investments. The protection of IPRs has been and continues to be a major concern for global marketers and consumers. Shultz and Nill (2000) explain that the extent to which IPRs are protected, shared, borrowed or stolen has profound implications for a multitude of stakeholders, including the party that owns it, investors and employees with firms who control the rights, rogue marketers and disfranchised opportunists who counterfeit, pirate and distribute it, consumers and businesses who wilfully or unknowingly purchase counterfeits, and future generations who may or may not benefit from innovations.

May (2000:80) cites a 1992 GATT brochure titled *The Uruguay Round: A giant step for trade and development and a response to the challenges of the modern world*, which provides the following reasons for the need to conclude an agreement on intellectual property:

- i. *The protection of intellectual property has become a key element in international competition: creativity and inventiveness are major assets in competition between companies and countries;*
- ii. *The scale of trade in counterfeit products has reached alarming proportions and it involves a very broad range of products, from pharmaceuticals to auto parts and luxury goods;*
- iii. *The protection of intellectual property is a factor in technological progress: it can encourage technology transfer between countries, leading to investment and jobs;*

- iv. *The protection of intellectual property has become a source of trade tensions in recent years, owing to the differences in the levels of protection in competing countries.*

The TRIPs agreement encompasses, in principle, all forms of intellectual property³⁵ and aims to harmonise international standards on intellectual property. Although largely based on prior agreements³⁶, Dutfield (2001:8) notes that the uniqueness of the agreement stems from the fact that, “it is the first and only international treaty which seeks to establish enforceable universal minimum standards of protection for all major intellectual property rights”. It is also important to note that, unlike other WTO agreements, the TRIPs agreement does not seek to bring about a direct expansion in trade activity, but rather to create an environment that is conducive to an expansion in trade (Wilkinson 2000).

As with other agreements administered by the WTO, the TRIPs agreement is based on the principles of national treatment, most favoured nation treatment (MFN) and reciprocity (Das: 1998). These principles serve to ensure that no domestic parties are accorded special preferences, nor is any member to be denied ‘any advantage, favour, privilege, or immunity’ granted by another in respect of intellectual property protection³⁷. Das (1999:16) identifies the MFN provision as being “the very pillar of the multilateral trading system, it serves to strengthen the multilateral process in international trade policy”.

The inclusion of intellectual property at a multilateral level was viewed with suspicion as developing and least developed nations perceived them not as tools for free trade, but rather as tools for protectionism for the owners of IP in developed states (May 2000:83). Hoekman and Kostecky (1995:156) contend that the extension of IP in the international trading system and the harmonisation of laws of WTO members represents a major triumph for “US pharmaceutical, entertainments and informatics industries that were largely responsible for getting TRIPs on the agenda”.

Prior to the conclusion of the TRIPs agreement the international system for the protection of intellectual property consisted of a variety of treaties administered by the

³⁵The TRIPs agreement covers seven types of Intellectual Property Rights, these include: Copyright and Related Rights, Trademarks, Geographical Indications, Industrial designs, Layout Diagrams of Integrated circuits, Patents and Trade Secrets

³⁶Par. 3 Article 1 of the TRIPs Agreement requires that its members abide by the Paris Convention (1967), the Berne Convention (1971), the Rome Convention (1961) and the Treaty on Intellectual Property in Integrated Circuits. The World Intellectual Property Organisation (WIPO) administers these agreements.

World Intellectual Property Organisation (WIPO). In contrast, the TRIPs³⁸ agreement was developed in order to give adequate and effective protection to intellectual property rights with the aim of ensuring that the owners of these rights receive the benefits of their creativity and innovation (Repetto and Cavalcanti 2000), thereby encouraging efforts to create and invent. Unlike WIPO, which did not have the power to address enforcement issues and merely administered the respective conventions, the inclusion of IP in the WTO considerably enhances enforcement through the dispute settlement mechanism of the organisation. Non-compliance by member nations carries with it the threat of sanction in the form of retaliation.

Although the TRIPs agreement sets minimum substantive standards for several categories of IPRs it does not act as a rule-making system nor does it address domestic enforcement issues (D'Amato and Long 1997). These matters are presently determined by the respective domestic legal systems of member countries. Member nations are merely required to establish the minimum standards as stipulated in the TRIPs agreement. Members are thus allowed to develop stricter levels of protection provided these are consistent with the TRIPs and do not “themselves become barriers to legitimate trade”³⁹. In order to bring South African IP legislation in line with the minimum requirements as set out by TRIPs, three major legislative changes have already been made. These include the adoption of the Counterfeit Goods Act⁴⁰, the Intellectual Property Laws Amendment Act⁴¹ and the Copyright Amendment Act⁴² (WTO 2003).

3.3 THEORETICAL PERSPETIVE

3.3.1 WHAT IS INTELLECTUAL PROPERTY?

Attempting to define the concept of intellectual property requires an examination of the manner in which the term is used. An important distinction is drawn between the common or colloquial usage of the term and its legal description. Phillips (1986:3) explains that the common description of intellectual property comprises “all those things which emanate from the exercise of the human brain,” and includes things such

³⁷ Article 3-4. Ibid.

³⁸ *Agreement establishing the World Trade Organisation, Annex 1C*

³⁹ Preamble to the TRIPs agreement

⁴⁰ Act no. 37 of 1997

⁴¹ Act no. 38 of 1997

⁴² Act no. 9 of 2002

as ideas, inventions, works of art, designs, computers etc. In contrast to this definition the legal description of intellectual property focuses not on the object resulting from the exercise of the brain but rather on “ the rights which are enjoyed in the produce of the mind.” In many instances the distinction between the two is blurred, but it remains necessary to highlight this distinction since this study uses the rights definition as the basis for analysis. This distinction is also valuable as it is consistent with the distinction that exists for the concept of real property⁴³ as it is used in the theories of property that are employed in this study.

The term intellectual property will therefore be taken to mean the rights that may be asserted in respect of a product of human intellect or an intellectual object. Similar to other property rights, IPRs are relations between individuals. However, unlike real property rights, intellectual property relates to rights in abstract objects. Defining intellectual property in terms of a right still leaves the question regarding what the nature of such a right is. The most obvious answer is that the right referred to is a legal right and intellectual property regulation as a system is by definition a system of legal rights. However, in attempting to determine the extent to which the institution of intellectual property is able to protect traditional knowledge it is important to develop an understanding of the justification for the existence of these rights, since this provides an indication of the economic, moral and social rationale for their existence. Only after such an examination is it possible to determine the extent to which these rights are able to and more importantly, suited to, the protection of traditional knowledge.

Although the focus of this study is predominantly on legal rights, it is necessary to understand that institutions are not only comprised of formal rules. The conception of institutions that North proposes encompasses both formal and informal constraints. Formal constraints can be thought of as rules that human beings develop and are legally enforced by the state whilst informal rules refer to the norms of a society, such as conventions and codes of behaviour (North 1990:4). Norms are intimately related to and in many instances determined by the values and culture of a particular society and/or community. In North’s view institutions act to facilitate activities by reducing the levels of uncertainty in human interaction, thereby promoting the efficient coordination of social, political and economic activities. “Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape

⁴³ Macpherson (1978:2) explains this distinction as it relates to the term property,” In current common usage, property is *things*, in law and in the writers, property is not things but *rights*, rights in or to things.”

human interaction, in consequence they structure incentives in human exchange, whether political, social or economic” (North 1990:3). May (2000) suggests that the institution of property could be considered to have emerged as a means to coordinate the activities of individuals to promote social efficiency, which is to say that property rights might have emerged as a result of individuals competing over scarce resources.

Examining the extent to which existing IPRs are able to protect traditional knowledge requires examining the extent to which the formal institution of IP is able to complement or substitute for the informal institutions that govern their use within communities. Such an examination also requires an assessment of the conflict between the formal and informal institutions and the manner in which this conflict is manifested. This contributes to understanding the mechanisms that can best be utilised to limit this conflict. It is for this reason that theories of property are utilised. This is done in an attempt to understand the existence of intellectual property rights not merely as legal rights but also the nature and underlying rationale for their existence as an institution in the global trading system.

3.3.2 WHY DOES INTELLECTUAL PROPERTY EXIST?

As the opening quotations indicate, the institution of property and its role in society has been and continues to be the subject of fierce philosophical debate. This debate is not confined to an argument about what the institution of property ought to be but includes disputes about what it is. Macpherson (1978:1) ascribes this to the fact that the meaning of property is not constant: “ the actual institution, and the way people see it, and hence the meaning they give to the word all change over time.” He goes on to argue that since property is a man made institution which creates and maintains relations between people, it could be seen to have been made and maintained for some purpose. It therefore becomes apparent that those who see the purpose differently will thus see the institution differently.

Drahos (1996) asserts that the idea of property has been and continues to be one of the 'bedrock' subjects of social science theorizing. This is borne out by a cursory glance at a list of eminent writers who have addressed the question of property: Locke, Rosseau, Bentham, Marx, Hegel, Mill, Veblen, Coase, Commons, Arrow and numerous others. A large body of literature thus exists about theories of property, but relatively little of it has dealt explicitly with intellectual property. This could be ascribed to the view that

any general theory of property would significantly explain all forms of property, including intellectual property (Drahos: 1996). Determining whether such a view is correct or not is beyond the scope of this study but an attempt is made to introduce the dominant theories of property and show the links between them and intellectual property as done by Drahos (1996), Shiffrin (2001) and Fischer (2001).

Drahos (1996) argues that although a distinctive theory of intellectual property may need to be developed, existing theories of property contribute a great deal to our understanding about the phenomenon of intellectual property. Given the contrasting nature of the objects of ownership May (2000:45) contends that there are significant philosophical problems with importing existing property theories into intellectual property, but recognises that an appeal to these theories is made "...in most if not all debates and disputes about the protection and transfer of knowledge." It is for this reason and the fact that these theories have served as the most pertinent justification for the existence of property rights that this study uses existing property theories to explain intellectual property.

The theories that will be used in this regard include the labour or natural rights theory and the utility theory of property⁴⁴. The focus of this study is on the trade related aspects of intellectual property and in order to effectively examine this it is necessary to investigate the economic rationale for the existence of intellectual property rights. Given that the South African property rights system is largely inherited from its European counterpart and the fact that these theories have not only provided the basis for European thinking on property but have also served to provide the greatest economic justification for the existence of property rights and hence intellectual property rights (May 2000, Drahos 1996, D'Amato and Long 1997, Shiffrin 2001 and Fischer 2001), these choices prove to be the most appropriate for the purposes of this study. May (2000:22) refers to these theories as a 'justificatory schemata of property'- that is often used to justify intellectual property. He uses the term schemata to emphasise that these arguments are "used to achieve a certain end, the continuity and reinforcement of a particular understanding of property in knowledge."

The existing literature on property theories and their references to intellectual property does not often distinguish between the different categories of IPRs, and generally treats all IPRs under the umbrella term "rights to knowledge" or "rights in information".

⁴⁴ A third theory, the Personality Theory as formulated by Hegel is excluded from this discussion in an attempt to limit the focus of this study as far as possible to economic considerations.

Drahos (1996), Shiffrin (2001), Ryan (1984 and 1987), May (2000) and Hettinger (1989) do however distinguish between the various categories of IPRs when interpreting the extension of traditional theories of property to intellectual property. These distinctions tend to be confined to two groups of IPRs, namely industrial intellectual property, which broadly refers to patents, trade secrets and trademarks (with patents often being used as a proxy for the other rights in this group), and literary or artistic intellectual property (copyright). These rights differ from each other in terms of legal detail and characteristics and even though these rights do not represent all the categories of IPRs recognised under the TRIPs agreement, they do tend to serve as a good proxy for discussions on the nature of IPRs in general given that they share the fundamental characteristic of referring to rights in abstract objects. The distinction between industrial and artistic intellectual property is maintained throughout this study with the greater emphasis being placed on industrial intellectual property, as it is this group of rights that is most relevant for the topic of traditional ethnobotanical knowledge.

(a) A NATURAL RIGHT THEORY OF PROPERTY⁴⁵

Does an individual possess a natural right of property in the abstract objects that they discover or create?

The natural rights or labour theory of property attempts to provide an answer to this and in so doing provide a justification for the existence of such a right. Although not explicitly dealing with rights in abstract objects the natural rights theory does provide valuable insight into the nature of property rights in general, and its arguments can be and have been extended to rights in abstract objects (Drahos 1996, May 2000, Shiffrin 2001 and Fischer 2001). No discussion on the natural rights approach to property can be undertaken without mention of the contribution of John Locke. His *Two Treatises of Government (1690)* provides the single greatest influence on the natural rights theory of property. Many interpretations of Locke's 'labour theory of property' exist (Ryan 1987, Macpherson 1978, Shiffrin 2001, Hettinger 1989, Drahos 1996 and others) and no attempt is made to add another. This discussion merely describes the theory, introduces

⁴⁵ The natural right theory of property as proposed by John Locke is often termed the labour theory of property because of its emphasis on the contribution of labour in securing property. These terms will be used interchangeably throughout this study and will be meant to refer to the basic theory as outlined in this section.

some conflicting interpretations and, using the approach of Drahos (1996) and Shiffrin (2001), applies these interpretations to intellectual property.

Locke's justification for the existence of a natural right to property is as follows:

Though the earth, and all inferior creatures be common to all men, yet every man has a property in his own person. This nobody has any right to but himself. The labour of his body and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided, and left in it, he hath mixed his labour with, and joyned to it something that is his own, and thereby makes it his property. It being by him removed from the common state nature placed it in; it hath by this labour something annexed to it, that excludes the common right of other men. For this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joyned to, at least where there is enough, and as good left in common for others." [Section 27, Chapter V, Book II of Locke's Two Treatises on Government 1690 – reproduced in Macpherson (1978:18)].⁴⁶

The natural rights approach derives individual rights from the law of god, or nature or reason. The assumption is that 'every man has a property in his own person' and as a result an individual's labour also belongs to that individual. In conjunction with this, justifying private property from a starting point of common ownership of resources (i.e. that which nature has provided) Locke's argument for property can be logically developed. An individual is assumed to own their body and therefore it can be assumed that such an individual owns what it does, that is, it's labour. If an individual's labour and the product of such labour cannot be separated it follows that if a person is to own his or her body and thus its labour, then he or she must also own what he or she joins with that labour, that being the product of such labour (Hettinger 1989, Ryan 1987, Macpherson 1978, May 2000, Shiffrin 2001 and Fischer (2001).

The labour theory bases its justification of property rights on the belief that labour should be rewarded. For Locke it is this belief that provides the connection between labour and property with property rights being considered a just reward for the

⁴⁶ Drahos (1996:43) summarizes the core propositions of Locke's theory:

- God has given the world to people in common.
- Every person has a property in his own person.
- A persons labour belongs to him.
- Whenever a person mixes his labour with something in the commons he thereby makes it his property.
- The right of property is conditional upon a person leaving in the commons enough and as good for the other commoners.
- A person cannot take more out of the commons than they can use to advantage.

industrious. It is important to note that labour is not property but that property is considered the reward to labour. This view provides a central tenet upon which the modern intellectual property system is based (i.e. reward to labour) and also provides an indication of a utilitarian argument that is often used to justify property rights. The distinction between the two theories is maintained by the natural rights theory basing its argument on the ideal that it is a 'god given' right (moral right) to be rewarded for labouring whilst the utilitarian argument is based on a very different premise, as is shown in the next section.

Accepting the view that property rights relate to rights of individual ownership leads to the question regarding the extent of such a natural right. In terms of the propositions forwarded by Locke, the existence of property rights has to be consistent with and is constrained by the requirements that an individual leave in the commons enough and as good for the other commoners and that an individual cannot take more out of the commons than they can use to their advantage⁴⁷. According to Locke these conditions set the natural limits for appropriation as a reward to labour. However, as May (2000) points out, these constraints are normative and do not provide an explicit indication of the point at which an individual appropriating property as a reward for his or her labour could be considered to be 'overstretching' these bounds.

In extending Locke's discussion to intellectual property it is important to remember that his discussion referred to ownership of physical objects rather than abstract objects. The principles of Locke's theory appear to be consistent with the modern conception of intellectual property since they permit the private appropriation of property from the common stock provided certain provisions are met⁴⁸. The 'enough and as good' and 'appropriate only what one needs' provisions explains why Locke's theory appears to be consistent with the concept of intellectual property. Shiffrin (2001) explains why many believe that these conditions appear to be easier to overcome for IP. Firstly, IP, unlike real property that is scarce, does not seem to be at risk of depletion. Second, intellectual products are less prone to waste and spoilage because their usefulness does not decline or expire as with real property. Finally, it could be considered easier with intellectual products as opposed to real products, to isolate the value of labour's contribution from the value of the initial product

⁴⁷ This is often referred to as Locke's 'spoilage' provision

⁴⁸ The provisions outlined above. Refer to note 44.

However, an alternative view suggests that the very nature of intellectual works make them less, rather than more susceptible to Lockean justifications for private appropriation (Shiffrin 2001:140, Drahos 1996:51)⁴⁹. The most important criticism levelled against the natural right theory relates to the connection it posits between labour and the object of the property right. Drahos (1996:51), Hettinger (1989:37) and Shiffrin (2001:142) highlight this by citing Robert Nozick who questions why a person should gain what they mix with their labour rather than losing their labour⁵⁰. The problem with the natural rights approach to property using labour as its basis is that, if such a natural right is to exist there must be a means of precisely determining the object of the property right. This problem is magnified when dealing with abstract objects that have no clear boundaries. Isolating labours' contribution to an intellectual activity is also problematic since intellectual activity does not occur in a vacuum and is dependent on the ideas and knowledge of those before us. Human capacity to exploit an infinite pool of intellectual products is dependent on the level of cultural and scientific knowledge that exists at a point in time. Therefore the development of an intellectual product cannot be attributed to any particular labourer and is fundamentally a social product (Hettinger 1989:38)⁵¹.

Applying this justification to traditional knowledge indicates the difficulty surrounding the issue of ownership and control. The intergenerational and trial and error use of resources that contributes to the existence of traditional knowledge of a plant constitutes a labour contribution thus entitling a community to a property claim over such knowledge. In addition, the labour exerted by researchers and companies to develop a commercially viable product would also warrant property rights in terms of this theory. However, IPRs recognise the rights of only one party (the first to claim that right) to the exclusion of others.

⁴⁹ Both Shiffrin and Drahos take an extended excursion into the underlying motivations and structure of Locke's general theory. A review of these discussions is beyond the scope of this study but will be touched upon as they provide valuable insight into the nature of IP and the debate around its justification.

⁵⁰ Nozick as cited by Drahos, Hettinger and Shiffrin, illustrates this difficulty by imagining pouring a can of tomato juice into the ocean and asking whether he thereby ought to gain the ocean or lose his tomato juice.

⁵¹ Hettinger (1989:38) states, "Separating out the individual contribution of the inventor, writer, or manager from this historical/social component is no easy task. Simply identifying the value a labourer's labour adds to the world with the market value of the resulting product ignores the vast contributions of others. A person who relies on human intellectual history and makes a small modification to produce something of great value should no more receive what the market will bear than should the last person needed to lift a car receive the full credit for lifting it."

Although criticised for not providing an adequate justification for the existence of intellectual property, the labour theory does provide an important moral argument for the existence of intellectual property rights. Being entitled to the fruits of one's labour is a fundamental premise upon which this theory is based and also provides an important justification for the existence of property rights in both real and abstract objects. The difficulty of this approach is that the moral argument it posits is equally applicable to both traditional knowledge holders as well as commercial enterprises that develop products based on traditional knowledge.

(b) A UTILITARIAN APPROACH TO PROPERTY

The utilitarian theory of property also uses labour as the basis for its defence of property rights, albeit in a different way from that employed in the labour theory. In contrast to the labour theory, the utilitarian argument is not based on the idea that property is the just reward to labour but rather on the belief that property, through its value, provides incentives for labour. Whereas the natural rights theory considers property rights to be a 'god given' right the utilitarian approach recognises that property rights are a socially constructed phenomena designed to serve a certain purpose (i.e. act as an incentive to labour). Jeremy Bentham's *'The theory of legislation'*, argues that it would not be possible to use the raw materials nature provided for anything other than immediate consumption unless individuals possess a right to appropriate, use and transfer objects of value or interest (Ryan 1987:53). Property rights can thus be considered as having been created to serve some useful or even profitable purpose in society.

In terms of the utilitarian argument, the right to property satisfies a security need and it is in this way that it provides a natural incentive to labour, Ryan (1987:55) explains, "... we are impelled to labour by the mere desire to stay alive, but no man will sow where another may reap in his stead; by guaranteeing that we may call our own our own, rules of ownership ensure that our desire for well being will lead us to work". The legal recognition of ownership as an effective way of promoting happiness and security provides the central tenet upon which the utilitarian argument is based. Extending this justification to intellectual property is straightforward and the same argument as outlined above is applicable. As with other property rights, intellectual property rights provide incentives for the creation of intellectual products. If no IPRs existed there would be no incentive to invest in the development of intellectual products and

techniques. It would be easier for firms to let others develop products and then simply copy the results and as a result no original development would take place⁵². The utilitarian argument claims that IPRs provide the security and thus the incentives to ensure that this does not occur (Hettinger 1989:48).

The utilitarian justification provides the strongest argument for the existence of intellectual property rights and as such is the most widely used justification (Hettinger 1989 and Fischer 2001), however this argument is criticised for being paradoxical (Hettinger 1989, Fischer 2001 and May 2000). Joan Robinson as quoted in Hettinger (1989:48) explains the paradox of this argument, “A patent is a device to prevent the diffusion of new methods before the original investor has recovered profit adequate to induce the requisite investment. The justification of the patent system is that by slowing down the diffusion of technical progress it ensures that there will be more progress to diffuse....” IPRs act to restrict the availability and use of abstract objects in an attempt to ensure that the production of these objects increases thus ensuring that new objects are available in the future.

The constitution of the United States of America provides a clear indication of the strength of the utilitarian argument when it provided the following reason for copyright protection, “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries” (U.S. Constitution Art. 1 Section 8). Adopting a similar reasoning the TRIPs agreement was developed in order to give adequate and effective protection to IPRs with the aim of ensuring that the owners of these rights receive the benefits of their creativity and innovation, thereby encouraging efforts to create and invent. In terms of the TRIPs agreement WTO member countries are required to recognise the stipulated categories of IPRs and establish minimum standards of intellectual property protection. Member countries are thus required to import a system of protection that is founded on utilitarian justifications and the ideals of individual ownership that have come to dominate global intellectual property systems.

3.4 THE ECONOMICS OF INTELLECTUAL PROPERTY

Both theories outlined above have at their core the recognition that information has economic value. This value is not limited to those who possess the information but

⁵² This phenomenon is referred to as ‘free riding’ and is discussed in the next section.

extends to society as a whole. Information is necessary for the formation of ideas; these ideas lead to the development of intellectual products, which if diffused, translate into a benefit for society at large. In economic terms with the focus on the functioning of markets, IPRs are closely connected to the existence of markets in information. They are the rights that are created for and exist within a market context (Drahoš 1996:119). Evaluating intellectual property from an economic perspective therefore requires evaluating it in a market context.

The utilitarian justification of IP is intimately related to an economic evaluation of IP. The role IPRs play in providing incentives and rewards to individuals provides the starting point for such an assessment because incentives and rewards act to ensure that rational self-interested actors react to the opportunities that IPRs create (Drahoš 1996:119).

3.4.1 A NEOCLASSICAL PERSPECTIVE

The neoclassical model, as with most economic models, is primarily concerned with material goods. Bearing this in mind it is important to remember that the characteristics of ideas and other intellectual products sets them apart from other commodities. Neoclassical economic theory seeks to explain economic behaviour on the basis of the construct of the rational individual who acts in a self-interested manner. This assumption is not without criticism but does provide a useful tool for explaining the behaviour of economic agents and is briefly introduced. In addition to the rationality assumption the neoclassical model of perfect competition is based on the following assumptions (Frank 2000:352):

- Firms are price takers
- Factors of production are perfectly mobile
- Firms and consumers have perfect information
- Firms sell a standardized product
- There are no barriers to entry

Neoclassical economics posits that under these conditions the price mechanism provides signals that lead to the demand of consumers being met by suppliers, resulting in the market achieving equilibrium. This equilibrium reflects how a perfectly competitive market is able to efficiently allocate resources to their most productive use.

This model as with most economic models is concerned with material goods. Bearing this in mind it is important to remember that the characteristics of ideas and other intellectual products sets them apart from other commodities.

To highlight the problem of applying this model to intellectual products, Drahos (1996) asks the following question, in terms of this model: how will a rational actor make decisions about investing in the production of knowledge? Investment in knowledge in a perfectly competitive market brings to the fore the issue of ‘public goods⁵³’. Much like a public good the development of a pure intellectual good⁵⁴ may require a substantial initial investment but once it is in existence the marginal cost of providing it to consumers is zero. In terms of the competitive model producers are required to price their products at the point where price equates to marginal cost. Therefore at zero marginal cost an optimal allocation would only occur where producers provide their ideas to the public at no cost. (D’Amato and Long 1997:46).

D’Amato and Long (1997:47) highlight two additional attributes of intellectual goods that set them apart from both public and private goods and aggravate this market failure. These they term ‘secondary production’ and ‘discontinuous marginal utility’⁵⁵. Secondary production refers to purchasers of intellectual goods being able to resell such goods without it losing much value and doing so whilst their holding of the good remains intact. The release of such a good in the market without protection results in the inventor’s monopoly being eliminated and the competitive market pushing the price to zero. Discontinuous marginal utility relates to an intellectual good only being valuable to a consumer the first time it is received. D’Amato and Long (1997:47) explain that this attribute has important marketing implications since buyers rarely know the value of information until they sample it, but having done so they have no incentive to purchase the information.

⁵³ Frank (2000:626) defines public goods as “those goods or services that possess in varying degrees, the properties of non-diminishability and non-excludability.” An additional characteristic of public goods is that of non-rejectability. This implies that once provided consumers are unable to reject such a good (e.g. light form street lamps, military protection etc.). However, it should be noted that the nature of the good in question is a crucial determinant of the extent to which a good may be non-rejectable.

⁵⁴ . D’Amato and Long (1997:45) define a ‘pure’ intellectual good as an idea that can be stored and transmitted without cost or degradation

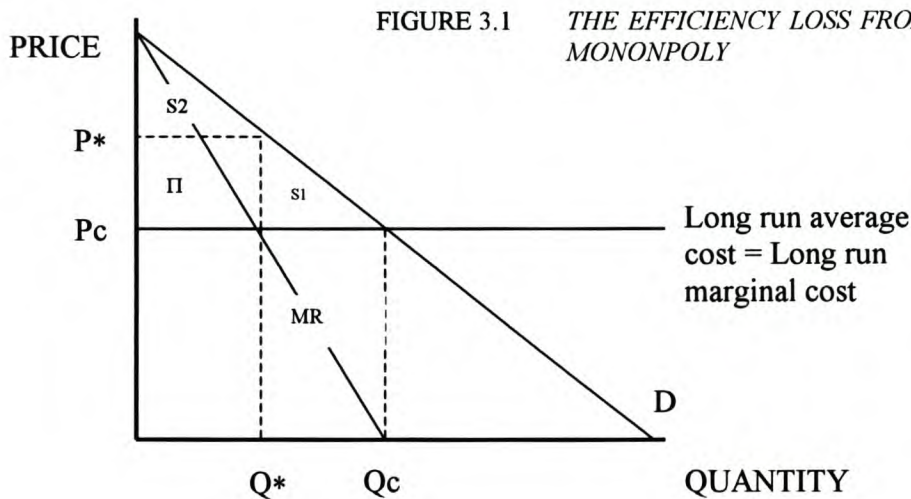
⁵⁵ D’Amato and Long (1997:46) explain these attributes “in this regard [secondary production], intellectual goods occupy precarious middle ground between public goods, which usually flow from a single source and cannot be resold, and private goods, which can be resold but, once resold, are no longer available to the original purchaser. [In addition-discontinuous marginal utility]...when an individual consumes the intellectual good ‘2+2=4’ for the first time, something new has been learned and personal welfare is enhanced. When the consumer receives the same message a second time, however, its value is reduced to zero.”

Returning to the question posed by Drahos (1996), it would appear that in a perfectly competitive environment, the best strategy for a rational self interested individual is to free ride and enjoy the benefits of a good without having to contribute to its production. Free riding refers to choosing not to contribute to a cause but still benefiting from the donations of others. Drahos (1996:121) argues that even though free riding contributes to the diffusion of information, which contributes to the productive potential of an economy, it does pose the problem that insufficient resources will be devoted to the creation of new intellectual products. He contends that under conditions of perfect competition some innovation in information would still occur since it would give the innovators first market entrant advantages but it would not result in an optimal allocation of resources for the creation of new information. The nature of intellectual goods therefore contributes to the market for such goods being inherently unstable. This case of the market failing to optimally allocate resources is overcome by the existence of IPRs.

In a similar vein to the utilitarian justification, IPRs are considered to provide rewards or opportunities to gain a reward in the market place. These rewards act as incentives for individuals to produce new information, which if diffused to others, benefits society (Drahos 1996:122). The paradox highlighted by Hettinger (1989) is also pervasive in this instance. The reward opportunities created by IPRs act as an incentive for individuals to produce new information, which benefits society, but holders of these rights are given power to restrict access to information and this can result in less than optimal use being made of new information. Drahos (1996:122) concludes, "The very protection which encourages production at the same time thwarts the object of the exercise, namely the diffusion of knowledge".

Perfect competition assumes perfect information and no barriers to entry. All actors in the market are thus assumed to have the information that is relevant to their choices and are able to enter the market in response to profit opportunities. The introduction of IPRs challenges these assumptions; patents are designed to confer monopoly power to the rights holders, which acts as a significant barrier to entry. In addition IPRs are constructed with the aim of restricting the unauthorised use of knowledge. Holders of these rights are granted the power to restrict the flow of information. If restricting information holds benefits then the rational self-interested individual will act to ensure that these informational asymmetries are maintained and all possible benefits are appropriated.

In a market context, these factions can be identified as consumers and producers with the link between power and intellectual property translating into market power. IPRs (patents in particular) are often criticised as being monopoly rights. A monopolist has choice in setting price and usually does so to extract maximum profit. Figure 3.1 shows the welfare effects on monopoly power resulting from a patent.



In contrast to the competitive producer who produces output at the point where price equals marginal cost, a profit-maximising monopolist chooses the level of output where marginal revenue equals marginal cost. The problem with this is that it results in an efficiency loss. In figure 3.1 a competitive industry operating under these cost conditions would produce Q_c and sell at price P_c generating a consumer surplus of area $\Delta SI + \Delta S2 + \Pi$. In contrast a monopolist who charges a single price to all consumers will produce Q^* and sell at a price P^* . This results in a loss of consumer surplus equal to the area $\Pi + \Delta S1$ with the monopolist only earning Π .

The power of the monopolist to set the price results in unmet consumer demand. Monopoly power conferred by a patent directly affects the opportunity set of alternatives available to consumers. Patents confer real market power, power to restrict production and maintain prices, which allows for maximizing profits in the absence of competition (Cornish 1993). However, the degree of power enjoyed by a monopolist is curtailed to some extent by, the demand for or dependence on the product by consumers and the extent to which consumers are willing to accept substitutes or the extent to which substitutes are feasible (Drahos 1996:146). The cost to society is

therefore area ΔSI (deadweight loss), which represents the overall inefficiency of monopoly power. In this instance a patent, by granting monopoly power, results in an inefficient allocation of resources.

If patent protection results in an inefficient allocation of resources the question that remains is why then does patent protection continue to exist? In order to explain this the long-term costs associated with product development needs to be considered. The development of new good may require substantial investment in research and development. Once such a good is made available and in the absence of some form of protection competitors may easily copy and imitate the product. This results in a competitive market and a reduction in profits. Therefore, if protection is absent firms have no incentive to develop new products and would choose to free-ride on the innovative activity of others whilst those that do develop new products run the risk of not being able to recoup their initial investments. Conventional wisdom as reflected by the centrality of patent protection in trade discussions holds that the efficiency loss associated with providing protection that allows for monopoly rent extraction is offset by the benefit that innovators are protected and thus encouraged to invent and create.

3.4.2 AN INSTITUTIONAL PERSPECTIVE

North (undated: 5) emphasises that “the neoclassical result of efficient markets only obtains when it is costless to transact. When it is costly to transact, institutions matter. And because a large part of our national income is devoted to transacting, institutions and specifically property rights are crucial determinants of the efficiency of markets”. In terms of North’s argument property rights contribute to the efficiency of markets. The question that now presents itself is whether the same can be said for IPRs. North (1981:164) answers this in the affirmative by asserting that improved property rights lead to the development of new techniques. He explains, “throughout man’s past he has continually developed new techniques, but the pace has been slow and intermittent. The primary reason has been that the incentives for developing new techniques have occurred only sporadically. Typically, innovations could be copied at no cost by others and without any reward to the inventor or innovator. The failure to develop systematic property rights in innovation up until fairly modern times was a major source of the slow pace of technological change.”

This argument is consistent with the utilitarian and neoclassical argument in that it suggests that developing and enforcing property rights will reduce the incentive to free ride and increase the willingness of people to commit resources to the search for new inventions. It would therefore appear that where transaction costs exist the presence of property rights is essential to ensure that positive economic effects occur. Demsetz (1967:348) explains that an important reason for the emergence of property rights is the “internalisation of external costs and benefits⁵⁶.” The extent of property rights will thus depend on the nature of benefits and costs associated with an activity and on the nature of associated transaction costs.

Demsetz agrees with North (2000) on the need for strong property rights but points out: “his (North’s) chain of causation in regard to property rights should be reversed.” North proposes that a well developed property rights system will result in more innovation and invention being encouraged whilst Demsetz (2000:78) argues that the emergence and development of property rights “are responses to the profitability to be expected from creating and modifying property rights.” In the presence of IPRs informational asymmetries are created, which create profit opportunities for self interested individuals and once the strategic value of these rights is realised “opportunistic actors become interested in the rights themselves and their further redesign”(Drahos 1996:125). May (2000:19) argues that the emergence of particular institutions is connected with the need to reduce costs of certain behaviour and to maximise the benefits obtained by specific actors. These benefits are realised through opportunistic behaviour, which Williamson (1985:47) refers to as “self interest seeking with guile.”

North (1990:16) accepts that “institutions are not necessarily or even created to be socially efficient; rather they, or at least the interests the formal rules are created to serve, reflect the interests of those with the bargaining power to devise new rules. In a zero-transaction cost world, bargaining strength does not affect the efficiency of outcomes, but in a world of positive transaction costs it does”. The existence of transaction costs and bargaining power differences thus makes it feasible to consider intellectual property rights as an institution constructed to serve particular interests. This highlights the importance of understanding the vital role power plays in the creation, maintenance and alteration of institutions over time.

⁵⁶ May cites Demsetz (1967:348) to explain, “... all activities have costs and benefits to those who indulge in them. Property as an institution seeks to attach those costs and benefits to the owner of the property which produces them.”

Samuels (1981:13) defines power as the capacity with which to exercise choice. The range of available alternatives and the relative cost of those alternatives limits an individual's choice. Samuels (1981) argues that because conditions of scarcity and interdependence permeate society, the actions of one individual have an impact on other individuals. As a result the choices made by one affects the range of alternatives open to others and the choices made by others impact on the range of alternatives open to him (Samuels 1981:11). Similarly with private property, which Samuels (1981:15) refers to as power, the property rights of one individual is relative to the rights of others and "the greater the property holding, other things being equal, the greater the power, the greater the opportunity set and range of choice..." The ownership of property rights is a source of power, giving the holder the power to set constraints and act in an opportunistic manner (Kanel 1979). Drahos (1996) argues that when dealing with abstract objects with no natural boundaries the constraint setting power of IPRs holders increases dramatically. The property rights of others act as constraints to the choices of individuals and because IPRs affords greater power to their holders, they are able to limit the choice alternatives of others to a greater extent. This is reflected in the pricing strategy of a monopolist as outlined above. Drahos (1996) concludes that factions form naturally around property because it sustains their power and way of life and because IP offers the opportunity for preventive strategies in such a strong way it could be expected to have strong factions.

This power is reflected by the extension of IPRs into new areas, particularly areas relating to plants and animals, as an extension into these areas serves the interests of 'commercial entities' and multinational enterprises that possess the necessary power and are interested in changing the "rules" of the game to better serve their interests (Shiva 2001).

3.5 THE RELATIONSHIP BETWEEN IP AND TRADITIONAL KNOWLEDGE

The fact that IPRs deals with abstract objects, which unlike physical objects, do not have obvious boundaries, makes IPRs a unique and sometimes difficult subject for investigation. The relationship between IPRs and traditional knowledge is the subject of continuing debate. Some commentators argue in favour of IPRs for protecting traditional knowledge on the basis that they act as an incentive for preserving and developing traditional knowledge and associated practices. Others argue that IPRs are

not suited for protecting traditional knowledge since traditional knowledge generally falls outside the scope of protection offered by current IPR regimes and in addition traditional knowledge is based on a different set of cultural norms. Traditional communities (Matataua Declaration) and many commentators (Patel 1996, Buchner 2002, Mushita and Thompson 2002 and Wynberg 1998) criticise Western intellectual property rights regimes as being ill suited to and inadequate for the protection of traditional knowledge. The World Summit on Sustainable Development (WSSD) Johannesburg Declaration states, *“We believe that community rights over biodiversity and indigenous knowledge are collective in nature, and therefore cannot be privatised or individualised. Intellectual property rights as applied to biodiversity and traditional knowledge are private and monopolistic in nature and therefore incompatible with community rights. IPRs cannot exist within a traditional knowledge system and attempts to bring these two worlds together are misguided and unacceptable.”*

Even though traditional knowledge is unique it still remains ‘knowledge’ and as such has to be considered in terms of existing discussions on protecting knowledge (Gupta undated). The prevalent mechanism for the protection of knowledge remains IPRs, and as with other knowledge traditional knowledge has to be evaluated in terms of available theories. In order to undertake such a review it is necessary to highlight what the nature of ‘knowledge’ is. The most important characteristic in this regard is the abstract nature of knowledge. Knowledge can thus be considered to be an abstract object.

Drahos (1996) points out that many people need, use and depend on abstract objects and many of the interdependent relationships that characterize social life are linked to such objects. He explains further “A property form that allows private hands to capture important abstract objects creates, amongst other things, many person-dependant relationships in a society” (Drahos 1996:1). May (2000) explains the nature of intellectual objects by contrasting them with physical objects. He explains the distinction between material objects and knowledge (intellectual or abstract objects) by emphasising the limits on usage. Material objects by their very nature cannot be in two places at once and as a result simultaneous use is restricted to shared use of the object in a single location. In contrast knowledge is not restricted in the same way and use by one person does not necessarily preclude someone else from using the knowledge at the same time. This is indicative of the non-exclusive nature of intellectual objects, which means that they can be in many places at once and are not consumed by their use, a characteristic shared with pure public goods. The marginal cost of an extra user of an

intellectual object approaches zero as modern technologies make it possible for these objects to be almost unlimitedly available at a very low cost (May 2000: 45, Hettinger 1989:34).

Intergenerational invention, which is characterised by collective invention and common heritage, rests on the free exchange of information and rewards within and across communities. This is in direct contrast to the utility considerations that underpin the current IP regime, which promotes rewards and an individualistic conception of invention with monopoly power (Brush 1996 (b): 151). IPRs are designed for the protection of private goods and their extension to traditional knowledge with its public good characteristics poses a number of problems. The most important of these is not one confined to traditional knowledge only but knowledge in general. Arrow (1962:615) as cited by Brush (1996(b): 151) formulates this problem as follows: "in the absence of special legal protection the owner cannot ... simply sell information on the open market. Any one purchaser can destroy the monopoly, since he can reproduce the information at little or no costs." The IPR regime as it exists provides a solution to this in the form of excluding others and providing the owner exclusive rights to use the information. Brush (1996(b): 152) concurs with both Hettinger (1989) and Drahos' (1996) positions arguing that this solution benefits neither the owners nor the society.

Having identified traditional knowledge as a type of public good, and accepting North's assertion that property rights (including IPRs) contribute to the efficiency of markets, the question now becomes, do IPRs contribute to the efficiency of markets for public goods?

Milgrom and Roberts (1992) reiterate the 'free rider' problem as one of the largest incentive problems resulting from insecure or unassigned property rights. Extending their discussion to traditional knowledge, which is a public good, requires a description of the free rider problem or the 'tragedy of the commons'. The 'tragedy of the commons' refers to a single shared resource with many people having a right to use it, a characteristic shared by traditional knowledge. The argument suggests that when many people have a right to use a single shared resource there is an incentive for the resource to be overused. In a similar way, when many people share the responsibility to provide a resource, it will be undersupplied. In addition, when the residual returns to the resource are widely shared there is no incentive for any one person to bear the costs of maintaining and increasing its value. Concentrating ownership and clearly defined property rights will therefore lead to increased efficiency (Milgrom and Roberts: 1992).

Applying this argument to traditional knowledge as a public good once again highlights the problem of extending existing theories of property rights to abstract objects that do not have clear boundaries. Because of its abstract nature, knowledge or an idea is generally not subject to the problem of being overused or undersupplied. In addition, maintaining and developing traditional knowledge within communities is not associated with residual returns but rather with its use in practical applications and its cultural value to communities. Ownership and the associated residual returns only manifest when this knowledge is commercialised and the associated resource appropriated. Extending this approach to the object matter (i.e. genetic resources) of traditional knowledge moves the discussion from an intangible object (i.e. traditional knowledge) to a tangible object. In this instance Milgrom and Roberts' (1992) reference to the 'tragedy of commons' becomes relevant once again since a physical resource is subject to being overused or undersupplied. Accepting that traditional knowledge cannot be separated from the resources they apply to implies that strong property rights are necessary to provide incentives for maintaining and developing traditional knowledge and leads to the question, can IPRs contribute the efficiency of markets in traditional knowledge and associated biological and genetic resources?

Brush (1996 (b)), citing Demsetz argues that property rights will be extended as the benefits of new activities increase or their costs decrease and the transaction costs of excluding others declines and because the value of genetic resources and increasing proprietary control over them will be more rewarding. Extending IPRs to genetic resources will depend on the contractual relations between those who benefit from such an extension and those who suffer (Brush 1996 (b)). Coase (1960: 27) suggests that property will be negotiated when one persons' actions has an effect on another and "what has to be decided is whether the gain from preventing the harm is greater than the loss that would be suffered elsewhere as a result of stopping the action which produces harm." In terms of traditional knowledge determining this is not as clear-cut as it may seem. Given Coases' proposition, and evaluating the value of IPRs from both a community and company⁵⁷ perspective, it is clear that the gain from protecting traditional knowledge (i.e. preventing appropriation) has to outweigh the risk of not protecting traditional knowledge.

Considering this from a community perspective, the benefits of protecting traditional knowledge includes those of promoting self-determination, recognition, and

compensation (Toffel 2002). Self-determination refers to the ability of traditional communities to decide and exercise control over which of their resources to make available for commercialisation and to select which companies they wish to engage with including discretion regarding the range of applications that can be developed. Recognition, as the word implies, refers to the desire of communities to receive recognition for their contribution to products that are developed and commercialised by others. Compensation refers to a reward to the communities from those who develop and commercialise products based on traditional knowledge (Toffel 2002). These concerns represent the major motivations of traditional communities to acquire IPRs and are representative of the interests highlighted in the previous chapter. The cost of not protecting traditional knowledge is the cost of depriving communities from acquiring the above benefits. On the basis of this it appears that the benefits certainly outweigh the costs and as a result property rights should be negotiated, with the strongest form of property rights over knowledge being IPRs.

However, this analysis ignores an additional cost to traditional communities. This cost associated with protecting traditional knowledge relates to the potential that companies and research institutions, when confronted with strong intellectual property rights of communities, may choose not to develop and commercialise products based on traditional knowledge. Strong rights may act as a disincentive and limit the potential of communities having their traditional knowledge commercialised and thus deprive communities of potential benefits. This also represents the cost from a company perspective, with the cost and requirements of complying with strong IP protection for traditional knowledge outweighing the benefits of developing novel products and maximizing profits. The absence of property rights protection and the reliance on contractual benefit-sharing agreements for commercialised traditional knowledge may well be indicative that the benefits of IP protection for traditional communities are outweighed by its associated costs. Adopting this perspective, it would appear that the cost of protection may outweigh their benefits and as a result property rights will not be negotiated.

In addition, Brush (1996(b)), discounts the tragedy of the commons problem by arguing that this incentive problem rests on the assumption that is limited to a view of property as either constituting private property or no property (i.e. the commons) and can be

⁵⁷ Company is meant to refer specifically to pharmaceutical companies but may be applied to any enterprises that seek to develop commercial products based on traditional knowledge.

refuted by recognising that property is more complex than this. Bromley (1991) as cited in Brush (1996 (b): 147) identifies at least four major property regimes, these he lists as:

- State property;
- Private property;
- Common property; and
- Non-property regimes.

Milgrom and Roberts (1992) also distinguish between single ownership (private property) and group ownership (common property). As was explained in the previous chapter, traditional knowledge and resources usually fall in the ambit of common property (i.e. the common heritage principle). Brush (1996 (b)) explains that biological resources are subject to this principle because they are products of collective invention⁵⁸ and cooperative behaviour.

Brush (1996 (b)) concludes that it is social relations rather than a physical object that provide the essence of property and extending IP to traditional knowledge needs to be based on utility considerations and not on ethics. The major utilitarian argument for extending IPRs to biological resources is conservation (Brush 1996(a)) whilst it is more difficult to argue this for traditional knowledge. This may reflect why patents for plants are promoted whilst traditional knowledge is not included in the TRIPs agreement (which is underpinned by utilitarian and efficiency considerations) and the calls for protection are usually based on natural rights considerations that rely on ethical and moral arguments. This may also reflect another reason why advocates for stronger protection do not consider IPRs as appropriate tools for protecting traditional knowledge (Buchner 2002, Downes and Laird 1999, Patel 1996 and Wynberg 1998). Shiva (2001) goes as far as to suggest that IPRs function as more of a threat to traditional knowledge than a benefit⁵⁹.

⁵⁸ Brush (1996 (b)), citing Allen (1983), defines collective invention as occurring “when knowledge is accumulated in a continuous and incremental way.”

⁵⁹ Shiva (2001: 67) argues that when traditional knowledge is commercialised by a company that subsequently protects the resulting innovation by IPRs, communities that provide the traditional knowledge are impacted in the following ways:

- Companies receive free knowledge but private sale and prohibiting free exchange between individuals and communities results in exclusive or monopoly control being exercised over the biodiversity and traditional knowledge;
- The increase in the commercial value of biodiversity (e.g. a medicinal plant) resources is diverted away from meeting local needs to feeding the increased demand for the biological resource;

In the absence of property rights would cultural preservation and community survival act as a sufficient incentive to ensure the maintenance and development of traditional knowledge?

If not, Brush (1996 (b): 152) suggests that an alternative solution may be to create legal mechanisms that allow information to be appropriated as a commodity. However, the intangible nature of knowledge does not lend itself to this solution, Brush (1996(b): 152) cites Arrow (1962:615) who suggests, “no amount of legal protection can make a thoroughly appropriable commodity of something so intangible as information. The very use of the information in any productive way is bound to reveal it, at least in part.” The transfer of information as a commodity would therefore remove that information from the private and exclusive use of the innovator resulting in the person selling the information losing any monopoly benefits with the first sale (Brush 1996 (b)) and D’Amato and Long 1997). In addition the argument posed by D’Amato and Long (1997) becomes relevant once again. A person will only purchase knowledge if such knowledge has value. The value in this sense is the usefulness of that knowledge. Before purchasing knowledge the usefulness of that knowledge will have to be determined, which necessitates revealing that knowledge and thus resulting in that knowledge no longer being private. Arrow (1962:619) concludes that a free-market economy will under invest in knowledge creation and research because of the risks associated with it (i.e. only a part of its true worth can be captured as income, and returns increase with use.)

If Arrow’s conclusion is accepted, the question that presents itself is how can knowledge creation be encouraged in a free-market economy?

Both Arrow (1962) and Hettinger (1989) identify mechanisms that could be used to stimulate the production of knowledge. These include:

- The generation of knowledge by government institutions (extension offices, health laboratories),
- IPRs, and

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- This can lead to over exploitation of the resource and lead to extinction of the species;
 - Local scarcity combined with IPRs on products derived from the resource could eventually take the resource and its products beyond the access of the communities that provided the initial traditional knowledge;
 - The traditional knowledge holders lose their rightful share to emerging markets;
 - Other communities, which could have received the knowledge freely or at a low cost, are also made dependant on commercial interests.

- Public subsidies to private persons to create knowledge (universities, government contracts).

These systems, although different in nature, share the common view that recognises the public nature of creating knowledge and rely on open access to information, since open access to information is necessary for further innovation to be possible.

Irrespective of the approach or argument one adopts the inescapable reality is that a Western system of IPRs prevails and dominates global trade. IPRs remain the principal mechanism for protecting and enforcing control over information, and no discussion on protecting knowledge, traditional or scientific, can disregard their significance. This is also reflected within the CBD agreement that promotes protecting traditional knowledge. The provisions of the CBD relate to many aspects of biodiversity conservation where IPRs prove particularly relevant. These provisions include those that govern the interrelated areas of preservation of and respect for the knowledge, innovations, and practices of indigenous and local communities (Article 8), access to fair and equitable sharing of benefits arising from the utilisation of genetic resources (Article 15), the conservation and sustainable use of biological diversity (Article 16) and the transferring of technology (Article 19) (Monagle and Gonzales 2001). In addition, Article 16 (2) recognises that the development and transfer of technology will be affected by IPRs and states: “...*access and transfer shall be provided on terms which recognise and are consistent with the adequate and effective protection of intellectual property rights.*”

Articles 16(3), (4) and (5) go on to define the manner in which Article 16(2) is to be applied. Signatories are required to “*take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights...in accordance with international law*” (Article 16(3)). Parties are also required to take measures “*with the aim that the private sector facilitates access to, joint development and transfer of technology referred to in paragraph 1...*” (Article 16(4)).

Recognising that IPRs are likely to have an influence on the implementation of the CBD, signatories are instructed to “*cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives*” (Article 16(5)).

Patel (1996) conceptualises these provisions by indicating the positions taken by one or another contending party to the convention and concludes that Article 15, which deals with access to genetic resources was one that developed countries were most interested in; whilst Article 16 relating to access and transfer of technology was the one most developing countries were interested in. Patel (1996) concludes that the final draft of the two articles reflects compromises by each side. These compromises are significant, bearing in mind in that they were agreed to prior to the conclusion of the TRIPs agreement and may have been of a different nature had developing countries recognised the implications of the subsequent inclusion of an IP agreement in the WTO framework, and the restrictive nature of the subsequent agreement.

These considerations represent an important point in understanding why debate and uncertainty prevails regarding the manner in which TRIPs could be used to further the objectives of the CBD. Confining the focus on the manner in which CBD objectives can be furthered through the TRIPS agreement ignores the important points that these agreements are different in nature, concluded at different times, underpinned by different concerns and reflect and promote different objectives.

3.6 CONCLUSIONS

IPRs occupy an increasingly important position in the international trading environment. Industries seek protection for their innovations and knowledge. The TRIPs agreement establishes a minimum level of intellectual property protection that member countries are obliged to adopt and firmly entrenches IP as a trade issue. Ratifying the agreement places a certain measure of restriction on national sovereignty in the area of intellectual property, and compels members to import a conception of intellectual property that may be foreign and ill suited to the needs of the country.

As with other property rights, IPRs relate to entitlements associated with ownership. The right to property therefore has an axiomatic link with the concept of ownership both in modern theories of property and in the law. However, unlike traditional property rights that relate to real objects, IPRs relate to rights over abstract objects, with traditional knowledge constituting one such object. The tendency in theories of property is to focus almost exclusively on individual ownership, and it is this tendency that raises particular problems when attempting to apply existing IPRs to traditional knowledge. IPRs as they exist in the global trading systems provide a formal institution

for regulating trade in knowledge and ideas. The prevailing IPR regime as promoted by the TRIPs agreement is embedded in a culture of individualism and private ownership. Paradoxically it draws its justification from the view that by recognising individual rights in IP (thereby restricting the flow of information) the system of rights ultimately promotes the Benthamite ideal of ‘providing the greatest good to the greatest number’, in the form of more innovation.

Economic justifications for the existence of IPRs are largely consistent with the utilitarian approach to property rights. These approaches do not view property as a moral right but rather as a necessary construct designed to promote social welfare and efficiency. Inventors and innovators require protection for their labour as a means of encouraging them to create and invent. IPRs confer monopoly power to their holders and these rights are considered necessary in stimulating innovative activity. IPRs are thus considered to promote efficiency in the market for knowledge. The utilitarian considerations that underpin IPRs and the focus on private ownership pose significant challenges when attempting to extend IPR protection to traditional knowledge. This problem is compounded by the public good nature of traditional knowledge and contributes to the continuing debate on the appropriateness of using existing IPRs as a tool for protecting traditional knowledge.

Finally, it must be emphasised that IPRs as contained in the TRIPs constitute the primary mechanism for protecting knowledge. In the absence of national legislation and an international agreement that specifically provides for the protection of traditional knowledge, existing IPRs may have a valuable role to play in the protection of traditional knowledge, both at a national and the multilateral level.

CHAPTER FOUR

PROTECTING TRADITIONAL ETHNOBOTANICAL KNOWLEDGE IN SOUTH AFRICA

We oppose biopiracy and the patenting of our biological resources and knowledge because it goes against our human and cultural rights and identity.

[Johannesburg Declaration]

4.1 INTRODUCTION

The debate on the relevance and appropriateness of the conventional IPR regime for medicinal products based on traditional knowledge has become very emotive in recent years. As the previous chapter noted many communities, NGOs and commentators argue that the existing IPR regime has no role to play in protecting traditional knowledge. The individualistic and utilitarian nature of the prevailing IPR regime does not recognise the communal nature of such property and negates the ethical dimension of protecting traditional knowledge. The evolution of the IPR regime as a system for protecting industrial designs and processes is also often cited as a reason why IPRs as they exist are not suited for biological processes and products. Patel (1996:319) goes as far as to claim that the existing IPRs regime can in no way serve the interests of traditional communities and knowledge holders and describes any attempt to do so as “building castles in thin air.”

This chapter investigates this assertion as well as the counter-claim that existing IPRs are able to provide for the protection of traditional knowledge. This is done by testing the applicability of existing South African IP legislation to the protection of traditional knowledge.

In the first section the *Sutherlandia Frutescens* is introduced. This plant provides a source of traditional knowledge that can be used to undertake the analysis. The different categories of IPRs are then introduced with the categories of rights most relevant to traditional knowledge being highlighted and discussed. Applicable South African IP legislation and other appropriate legislation is then investigated and applied to the *Sutherlandia Frutescens*. This is done by applying the legislative requirements for IP protection in each category of right to the *Sutherlandia*.

4.2 THE SUTHERLANDIA FRUTESCENS (SUB SPECIES MICROPHYLLA)

On the 15 March 2001 the East London based “Daily Dispatch” ran an article titled “Herbal treatment for Aids”, which highlighted a claim by traditional healers that an indigenous herb, the *Sutherlandia*, could improve the condition of AIDS patients. On the 5 September 2001, Carol Campbell published an article in the Cape Argus titled “Time to look to our heritage for AIDS cure” reporting that research conducted on the medicinal value of *Sutherlandia* indicated that it dramatically improved the quality of life of many AIDS sufferers. Subsequent reports by the BBC (Dempster 2001) and New Scientist (2001) all reinforced the value of the plant as a potential treatment for AIDS sufferers. Campbell (2001) citing Professor Ben Erik van Wyk remarks that the value of the plant lies in its application as an anti depressant, an anti anxiety treatment and in boosting the appetite of patients. The Medical Research Council (MRC) of South Africa describes the plant as “ a promising indigenous medicinal plant with a history of use, as a promising tonic, going back at least 105 years. There are anecdotal indications that that this tonic may be of value to people living with AIDS in terms of enhanced well-being, increased appetite and body mass as well as increased tolerance for exercise.”⁶⁰ The Indigenous Knowledge Systems Division (IKS division) of the Medical Research Council (MRC) of South Africa took up the call and put the herbal claims to the test by evaluating the safety of the *Sutherlandia*.

The division created a ‘clinical platform’ on which safety and efficacy studies could be executed. The division reports that to date no adverse effects have been reported for the plant but state that “ in order to strengthen the working hypothesis that the plant is indeed safe and efficacious, the MRC decided to use this plant as a test case for safety and efficacy studies on the "clinical platform", because of the significant ethnobotanical background and availability of the plant as well as the severity of the HIV/AIDS problem in South Africa (<http://www.sahealthinfo.org/traditionalmeds/firststudy.htm>). The independent safety study, (which was approved by the MRC Animal Ethics Committee), was conducted at the MRC Animal Centre using 16 vervet monkeys in four groups (control, 1x, 3x and 9x dose of the equivalent recommended daily dose). Over 50 variables involving blood chemistry, haematology, physiology and animal behaviour were monitored and evaluated by MRC Animal Centre scientists, statisticians and a medical doctor. No single indication of toxicity was found after

⁶⁰ <http://www.sahealthinfo.org/traditionalmeds/firststudy.htm> (19/11/2003).

feeding the vervet monkeys with dried *Sutherlandia* leaf powder for three months, even at the 9x dose. This is the first time that an indigenous South African medicinal plant has been evaluated for safety using vervet monkeys in a controlled environment.” (SA health info- toxicity study of *Sutherlandia* leaf powder (*Sutherlandia microphylla*) consumption)⁶¹.

4.2.1 TRADITIONAL KNOWLEDGE AND USE OF *SUTHERLANDIA*

The *Sutherlandia* information site states “*Sutherlandia Frutescens* is regarded as the most profound and multi-purpose of the medicinal plants in Southern Africa. Because of its efficacy as a safe tonic for diverse health conditions it has enjoyed a long history of use by all in Southern Africa.” The variety of names the plant enjoys is reflective of widespread use by a large range of communities in South Africa. It should also be noted that the plant cannot be patented in South Africa⁶² and, given the extensively documented use of the plant in the treatment of a variety of illnesses, is unlikely to be patented elsewhere. However, active compounds and ingredients of the plant may still be patented. The absence of an IP dispute around the plant and the unlikelihood of a dispute arising makes the plant a valuable subject for analysis since it allows for developing arguments along theoretical lines and positing a number of hypothesis that will be used to test the relevant legislation and extent of protection.

Using the criteria for community differentiation set out earlier⁶³, traditional knowledge and use of the plant for medicinal purposes can be identified across the following range of communities:

- The Setswana Community refers to the plant as ‘phetola’, which means ‘it changes’. This alludes to traditional use of the plant as a medication that changes the course of many illnesses into a favourable outcome (Sutherlandia.org). This community also refers to the plant as “Mukakana” and is noted for its use in treating gonorrhoea and syphilis.
- The Sotho community refer to the plant as “lerumo-lamadi” meaning “the spear of the blood”; this indicates the use of the plant as a blood purifier and all-purpose tonic. This community also refer to it as “motlelo” which means

⁶¹ <http://www.sahealthinfo.org/traditionalmeds/firststudy.htm> (19/11/2003).

⁶² South African patent legislation does not allow for the patenting of plants.

⁶³ Refer to chapter 2.

“bringing back the heart” indicating the use of the plant as a treatment for shock and stress (Sutherlandia.org).

- The Zulu community refers to it as ‘insiswa’ meaning ‘the one that dispels darkness’; this alludes to the anti-depressant effects of the plant. This community also traditionally used the plant as a calming tea administered to warriors returning from battle (Sutherlandia.org)
- The Afrikaans community know the plant as ‘kankerbossie’ meaning ‘cancer bush’ because of its properties in treating people suffering with cancers and wasting (Dempster 2001). This community also used the plant for its anti-diabetic properties.
- The Xhosa Community used the plant for its medicinal value during the 1918 influenza pandemic (Dempster 2001).

This list of the traditional use of the plant is not exhaustive and is merely intended to highlight the historical use of the plant as a treatment in a variety of illnesses across a diverse range of cultures and communities within South Africa.

4.2.2 CHEMISTRY AND PHARMACOLOGY

Given that the plant itself is not patentable it is the chemical compounds that comprise the plant’s active ingredients as well as associated pharmacological processes and applications that become the subject of patent applications. As box 2.1, chapter two indicated, it is usually the patenting of a compound or process associated with a plant that creates the threat to traditional knowledge. The *Sutherlandia* contains four key compounds that contribute to its efficacy in medicinal applications. Van Wyk and Albrecht (cited at Sutherlandia.org) studied the chemistry of the plant and concluded that the “biological activities of these compounds appear to validate some of the traditional uses of the plant, and further support the use of the plant as a quality-of-life tonic in cancer and AIDS patients.”

The active compounds found in the *Sutherlandia* include (Sutherlandia.org):

L-Canavanine

This is a non-protein amino acid described as a “L-Arginine antagonist” with documented antiviral, anti-bacterial, anti fungal and anticancer activities. These properties have been patented for their antiviral and anticancer activities. A search of

the USPTO database reveals that Peter. A. Crooks and Gerald. A. Rosenthal of the University of Kentucky Research Foundation are the holders of two patents for this compound (patent no. 5552440 and 5839295). These patents were granted in 1996 and are for L-Canavanine as a chemotherapeutic agent for the treatment of pancreatic cancer.

Pinitol

Narayanan 1987 (cited by Sutherlandia.org) identifies pinitol as a known diabetic agent. A US Patent search reveals two patents for this compound, patent no. 5550166 (August 1996) and 5827896 (October 1998). Richard Ostlund and William Sherman of the University of Washington hold both patents. The patent is for pinitol and derivatives for the treatment of metabolic disorder and suggests that pinitol may have clinical application in treating the wasting in cancer and AIDS patients, as well as an application in treating diabetic and stress disorders.

GABA

GABA is identified as an inhibitory neurotransmitter. Sutherlandia information (sutherlandia.org) identifies this transmitter as the compound that possibly accounts for the use of the plant as an anti-depressant in treating stress and anxiety in patients. No patents or trademarks for this compound were found.

SU1

SU1 is identified as a novel triterpenoid glucoside that was characterised and isolated. In addition it is identified as being “one of the key compounds used in the selection of raw material for propagation.” This compound is registered as a trademark by a Western Cape pharmaceutical firm⁶⁴. This company produces herbal pharmaceuticals and uses this *Sutherlandia* compound in their products.

Sutherlandia.org states: Preliminary scientific research, published peer-reviewed scientific research, and clinical experience suggests that key phytochemicals in select chemo types of *Sutherlandia* varieties are:

- Immunomodulatory
- Anti-inflammatory

⁶⁴ Phytonova is the trademark holder for this compound and producer of *Sutherlandia* pills and gels in the Western Cape. Personal discussions with Mr. Hans Ulrich Feiter from the herbal medicine company Parceval revealed because plants are not patentable that the major recourse to IPRs for producers is trademark protection of this sort. These trademarks serve to differentiate products and are essentially used as marketing and branding tools.

- Vaso-dilatory
- Analgesic
- Anti-viral, anti-fungal and anti-bacterial
- Anti-cancer
- Inhibitors of Tumour Necrosis Factor (TNF). Excess production of TNF is known to drive the wasting process in cancer, TB and AIDS patients.

The traditional knowledge, use and application of the *Sutherlandia* and the chemical compound analysis of the properties and uses of *Sutherlandia* appear to be complementary in terms of their medicinal application. In contrast to the cases of biopiracy outlined in chapter two, the absence of a dispute over the patented compounds in this instance is a result of these compounds not being unique to the *Sutherlandia* and knowledge of them not being only attributed to the traditional use of the plant. However, it is the combination and concentration of these compounds in the *Sutherlandia* that gives the plant its unique value as a medicinal plant.

The analysis that follows therefore posits a ‘what if’ scenario. This entails employing an assumption that allows for testing IP protection using a specific compound of the plant. In order to take the analysis further the following assumption is made: A single traditional community is responsible for identifying, isolating and adapting the relevant compounds. For simplicity in analysis one community will be used and one compound selected. This will be the Afrikaans community and the chemical compound pinitol⁶⁵. A further assumption made is that pinitol is a unique medicinal compound found only in the *Sutherlandia*. These simplifying assumptions do not aim to detract from the complexity of recognising ownership claims across communities but is intended to illustrate the complexity of applying intellectual property rights to traditional knowledge even when attempted within one identifiable community and with regard to one compound contained in such knowledge. The complexities of ownership both within and across communities is not discarded with reference to the impact of competing claims continually referred to in the discussions that follow.

⁶⁵ The choice of community and compound is based on the following considerations:

- Demographics of the Western Cape where the Afrikaans community is a majority
- History of traditional use of the plant
- Use of the plant as an anti-cancer treatment
- Pinitol is selected because of its anti-cancer properties that complements the traditional use of the plant

4.3 CATEGORIES OF IPRs RELEVANT FOR PROTECTING TRADITIONAL KNOWLEDGE

The value of protecting traditional knowledge has been highlighted but the debate continues to rein over the means for providing such protection. One proposed means of protection often cited is using the current IPRs regime to protect traditional knowledge. This proposal is also criticised as not being suited to the protection of traditional knowledge. These positions are tested in the sections that follow.

IPRs apply to a broad range of activities and the importance of the different types of rights varies considerably depending on the types of industries involved, the intensity of their research and development and the nature of the innovations. Table 4.1 provides an outline of the main categories of IPRs and their fields of application.

Table 4.1 *Subject matter and main fields of application of IPRs*

TYPE OF IPR	SUBJECT MATTER	MAIN FIELDS
PATENTS	New, non-obvious, indigenous applicable inventions	Chemicals, drugs, plastics, engines, electronics, industrial, control and scientific equipment
TRADEMARKS	Signs or symbols to identify goods	All industries
GEOGRAPHICAL INDICATIONS	Geographical origin of goods and services	Wines and spirits, cheese, food products
TRADE SECRETS	Secret business information	All industries
BREEDERS RIGHTS	New, stable, homogenous, distinguishable varieties	Agriculture and food industry
COPYRIGHT AND RELATED RIGHTS	Original works of authorship, artistic performance, broadcasting and phonograms production	Printing, entertainment (audio, video motion prior informed consentures) software, broadcasting
INDUSTRIAL DESIGNS	Ornamental designs	Clothing, automobiles, electronics
INTERGRATED CIRCUITS	Original layout designs	Microelectronics industry

Adapted from UNCTAD- Commercial Diplomacy Programme

The most important categories of IPRs⁶⁶ as contained in the TRIPs agreement are introduced below. These IPRs are also the most relevant for discussions on traditional knowledge.

- **Patents:** patents confer the exclusive right to make, use or sell an invention (usually limited to a period of twenty years). For an invention to be patentable it usually has to meet the requirements of novelty, inventive step (or non-obviousness) and industrial applicability and may be granted for both processes and products [*TRIPs 1995, Article 27, paragraph 1*].
- **Breeder's rights:** breeder's rights are a form of protection conferred on plant varieties that are new, stable, uniform and distinguishable. Exclusive rights, in principle, include the sale and distribution of the propagating materials. Breeder's rights generally permit use by other breeders of a protected variety as a basis for the development of a new variety ('breeders exception') and the re-use by farmers of seeds obtained from their own harvests ('farmers privilege') (UNCTAD 2002). Although not recognised as a separate category of rights under TRIPs, breeder's rights are a *sui generis* form of protection that is explicitly provided for under the TRIPs agreement [*TRIPs 1995, Article 27, paragraph 3(b)*].
- **Trademarks:** trademarks are signs or symbols (including logos and names) registered to identify goods and services. A valid trademark allows the owner to exclude imitations where this would mislead the public about the origin of a product. Trademarks are also subject to time limitation but they can be renewed upon expiry [*TRIPs 1995, Article 15, paragraph 1*].
- **Geographical indications:** these are signs or expressions used to indicate that a product or service originates in a country, region or specific place. There are different types of geographical indications. They are called 'appellations of origin' when the characteristics of the products can be attributed exclusively or essentially to natural and human factors of the place in which the products originate [*TRIPs 1995, Article 22, paragraph 1*].

⁶⁶ Definition of categories of rights adapted from UNCTAD, WIPO and the WTO definitions as contained on the respective websites.

- **Undisclosed information:** trade secrets protection covers confidential information of commercial value, including business information and know-how. They are protected as long as the information has commercial value and the secret is kept. This category also includes data for registration of pharmaceutical and agrochemical products, which must be protected against disclosure and unfair commercial use [TRIPs 1995, Article 39, paragraph 1].
- **Copyright and related rights:** copyright protection is provided to authors of original works of authorship, including literary, artistic and scientific works. It has also been extended to protect software and databases. The owner of a copyright can prevent unauthorised reproduction, distribution, sale and adaptation of original work. Protection is also subject to a time limitation, usually for the life of the author plus at least 50 years after their death or in the case of judicial persons at least 50 years [TRIPs 1995, Articles 9, 10 and 11, all paragraphs].

In the following sections, patents and plant variety protection, geographical indications, trademarks and trade secrets are discussed in greatest detail with copyrights and related rights alluded to only in so far as they have particular relevance to the issue of providing protection for traditional ethnobotanical knowledge.

4.4 SOUTH AFRICAN IP SYSTEM AND TRADITIONAL KNOWLEDGE

The South African intellectual property framework is well established. Historic ties with Britain and Europe have influenced the South African IP system, with the bulk of IP statutes guided primarily by British and European legislation (Wolson 2001). As was noted previously, these statutes were amended by the Intellectual Property Amendment Act to bring the legislation into compliance with the TRIPs agreement, but as Wolson (2001:2) notes “few changes of substance were involved.” This reflects the relatively developed nature and Western ideological influence that permeated the South African IP system prior to the existence of the TRIPs agreement. As a developing nation South Africa was in the rare position of adopting the TRIPs agreement, which underpinned an economic justification that was largely consistent with the already prevailing justification for IPRs in the country.

Patents, trademarks, copyright and designs are all regulated and enforced by the South African Patents and Trademarks Office, which falls under the auspices of the South African Department of Trade and Industry (DTI). IP disputes are litigated in the Court of the Commissioner of Patents, which is a part of the South African High Court (Wolson 2001).

4.4.1 PATENT PROTECTION AND PLANT BREEDERS RIGHTS⁶⁷

The prevailing system of patent protection is embedded in the belief that patent protection provides incentives for innovative activity, and by requiring applicants to publish details of the invention, the knowledge is disclosed and disseminated. The South African patent system is regulated by statute as contained in the South African Patents Act 57 of 1978 and its amendments. All references to the Patents Act will refer to this Act.

This analysis follows the framework used by Toffel (2002) who examines patent protection for traditional knowledge posing the question “is ethnobotanical knowledge patentable subject matter?” Toffel (2002) sets about examining this in terms of American patent legislation; this analysis adopts a similar approach using South African IP legislation.

In order to determine whether ethnobotanical knowledge is patentable subject matter it is necessary to determine what exactly is being patented, Toffel (2002) explains that ethnobotanical knowledge is the ‘know how’ that relates to applying a wild plant to a useful purpose. With regard to the *Sutherlandia* the useful purpose relates to its medicinal use. The traditional use of the plant as an antiviral and anticancer treatment may be useful to bioprospectors seeking to develop modern pharmaceuticals but the plant itself is not patentable. Section 25(4)(b) of the Patents Act denies patentability for “any variety of animal or plant or any essentially biological process for the production of animals or plants, not being a micro-biological process or the product of such a process.” The South African Plant Breeders Rights Act 15 of 1976 provides for the registration of plant breeders rights in respect of new varieties. This registration provides plant breeders with an alternative system of protection given that plants are not patentable.

⁶⁷ Personal discussion with Lambert Botha-Senior researcher at the Trade Law Centre for Southern Africa (TRALAC).

The result of these regulations with regard to plants can be summed up as follows: in terms of the Plant Breeders Act new plant varieties may be registered subject to certain conditions⁶⁸. In terms of the Patents Act plants and essentially biological processes for the production of plants are not patentable whilst microbiological processes and their products are⁶⁹. The act does not provide definitions for the terms ‘essentially biological’ or ‘microbiological’. Gernholtz (undated)⁷⁰ notes that this failure to define the terms has important implications given that “the application of a technical process to biological process could move the process from an unpatentable ‘essentially biological process’ to a patentable process involving some biological characteristics but not being exclusively biological”.

The *Sutherlandia* does not fall into either category and is thus not patentable in terms of the Patent Act (plants are not patentable) nor is it able to be registered in terms of the Plant Breeders Rights Act (not a new variety). Traditional knowledge cannot be protected through plant breeder’s rights because the plants the knowledge relates to are not new and cannot be registered.

Although plants are not patentable, traditional communities are not excluded from using the patent system as a means of securing rights over their traditional knowledge given that identifying and developing active compounds in a plant is considered a microbiological process (Ducor 1998) and therefore constitutes patentable subject matter. Section 25(1) of the Patents Act stipulates that a patent may be “granted for any new invention which involves an inventive step and which is capable of being used or applied in trade or industry or agriculture”. Identifying a medicinal compound in a plant would appear to easily satisfy the requirement of an invention being applicable in trade, industry or agriculture but whether it warrants patentability, as an invention is not clear. It could be argued that identifying and developing a compound obtained from a naturally occurring plant does not constitute an invention and is merely a discovery. If this view is adopted the active compounds also fall outside the scope of patent

⁶⁸ In terms of the Plant Breeders Act 15 of 1976 a variety is deemed ‘new’ if propagating or harvested material from it has not been sold or otherwise disposed of by the breeder:

- in South Africa for more than one year; and
- in a country signatory to the Berne Convention for more than six years in respect of vines and trees, and four years in respect of all other varieties.

⁶⁹ Similar uncertainties plague the TRIPs agreement, Article 27(3)(b), which fails to adequately define key terms and concepts.

⁷⁰ Gernholtz (undated) available at <http://gpa.co.za/english/basic/pt.htm> - page references not available on web document.

protection (Article 25(2)(a) of the Patents Act)⁷¹. Both the South African legislation and the TRIPs agreement appear to favour the former view and considers the isolation, identification and developing of active compounds from natural resources as constituting a microbiological processes which brings it into the ambit of patentable subject matter⁷². In terms of the requirements listed above it appears that knowledge of active compounds or substances (e.g. pinitol, canavanine) would qualify for patent protection in South Africa.

However, in contrast to scientific knowledge that employs sophisticated techniques and bioengineering to isolate, identify and adapt compounds, traditional communities use traditional knowledge to identify an entire plant or specific part of a plant that can be used but not specific compounds or substances of the plant. An inability to identify the active compounds and substances of a plant appears to limit the potential of patents being used by traditional communities as a means of protecting their knowledge. Toffel (2002) argues that without the technology to bioengineer plants traditional communities will not be able to use patents to protect their knowledge. Even if one assumes that traditional communities are able to identify the active substances in medicinal plants, further legislative requirements need to be fulfilled before communities would be able to secure patent protection for their knowledge.

Having established that the active compounds and substances of the *Sutherlandia* are patentable the analysis now shifts to further patent requirements. Von Seidel (1998) identifies three further requirements for patentability; these are novelty, inventiveness and utility. Having already established the utility of the compounds above⁷³ the focus now shifts to the remaining requirements of novelty and inventiveness, the difficulties associated with identifying inventors and ownership and the issue of costs as a constraint.

⁷¹ Article 25(2) of the Patents Act lists eight items as not being considered an invention for the purposes of the act and are thus non-patentable. Amongst these is “discovery” (supra note (a)).

⁷² In terms of the Oxford dictionary definition, microbiology refers to “the scientific study of micro-organisms.” The qualification of these compounds as microbiological processes and thus as patentable subject matter is borne out by the patenting of the active ingredients of a large number of plants. Most notable in the context of this study was the CSIRs’ patenting of the active ingredient, P57, from the Hoodia Cactus.

⁷³ Utility referring to the applicability of the invention in trade, industry or agriculture.

(a) Novelty

Novelty, as the word implies, refers to something that is new. For an invention to be patentable it must be new. The Patents Act provides the following provision “any invention shall be deemed to be new if it does not form part of the state of the art immediately before the priority date of any claim to that invention.” (Section 25(5)).

Section 25(6) explains what is meant by state of the art, “the state of the art shall comprise all matter (whether a product, a process, information about either, or anything else) which has been made available to the public (whether in the Republic or elsewhere) by written or oral description, by use or in any other way⁷⁴.” Gernholtz (undated) identifies the decisive words regarding novelty as being “made available to the public” which sets an absolute novelty yardstick.

This means that in terms of South African legislation any “public lecture, any publication, any television or radio programme or any newspaper publication of an invention anywhere in the world will destroy the novelty of an invention” (Gernholtz undated). It should also be noted that any person is able to destroy the novelty of an invention through disclosure. The disclosure provision does not distinguish between an outside person or the inventor or the patent applicant. These provisions indicate that to ensure patent protection it is necessary to file a patent application prior to disclosing the invention to any persons in any way.

Traditional knowledge is usually preserved in folklore and transmitted orally. Toffel (2002), citing US patent law with its ‘prior art’ provision, argues that patent novelty requirements reflect a Western tradition of sharing knowledge through written documentation. This contrast in the transmission of knowledge and the requirements of novelty has important implications on the patentability claims of traditional communities as well as on attempts to challenge bioprospectors who attempt to patent inventions based on their traditional knowledge (Toffel 2002). The recording and

⁷⁴ Gernholtz (undated) defines the key terms of Section 25(6) as follows:

- **Written:** may include all products of printing, machine writing, or handwriting. (Examples include letters, books, journals, newspapers, manuscripts, slides, films and even internet disclosure).
- **Oral:** includes lectures, speeches, discussions or communications, exhibitions, radio and television transmissions and marketing presentations
- **Use:** should be such to disclose the essentials of the invention. The use need not be on a commercial basis.
- **Or in any other way:** may include recordings on tape, gramophone records, compact discs and records in other forms of electronic media.

In addition to this section 25(8) of the Patents Act states that any invention “used secretly and on a commercial sale within the Republic shall also be deemed to form part of the state of the art...” and would therefore destroy the novelty requirement.

transmitting of traditional knowledge through oral traditions appears to indicate that traditional communities would not be burdened by novelty requirements since they could easily ensure that their knowledge is not publicly disclosed prior to their patent application (Toffel 2002). Extending this to the *Sutherlandia*, which has received extensive publicity for its medicinal properties, it is clear that any invention based on traditional knowledge of these properties will not be patentable since traditional communities would not be able to meet the ‘absolute novelty criterion’ set out in the act. This highlights that research conducted on medicinal plants and by ethno-botanists and ethno-pharmacologists often results in publications that place traditional knowledge into the public domain and thus preclude communities from the possibility of using the existing IPR regime to secure patent protection for their traditional knowledge.

As explained above, the oral traditions of traditional knowledge holders could assist communities in overcoming novelty requirements. However as Toffel (2002) explains this tradition can also prove costly to traditional knowledge holders. If bioprospectors wish to patent an invention based on traditional knowledge, the lack of public disclosure of the knowledge could potentially, prevent the traditional communities from being identified as the original inventors. This failure to identify traditional communities as original inventors, could contribute to bioprospectors being able to satisfy novelty requirements.

Applying this argument to *Sutherlandia* reveals that research and public disclosure of traditional knowledge of the plant excludes all parties, and not just traditional knowledge holders, from the possibility of obtaining patents based on medicinal application of the plant. In this manner, although not guaranteeing rights to the original traditional knowledge holders, the patent system does provide some protection (i.e. defensive protection) against unauthorised appropriation of traditional knowledge by bioprospectors. Protecting traditional knowledge through the IPR regime is not confined to positive protection (securing rights over an invention) but also extends to defensive protection (ensuring that others do not benefit unfairly from inventions based on traditional knowledge). Traditional communities could thus use the fact of prior publication of their knowledge (research or scientific studies) to challenge patent applications by bioprospectors, which claims that such knowledge is novel.

(b) Inventiveness

Assuming that on the basis of its oral traditional and the absence of publicised research, a community was able to satisfy the requirement of novelty of invention for its traditional knowledge, Gernholtz (undated) explains that when analysing patent claims inventiveness or obviousness is considered after novelty. Therefore if a community were able to satisfy novelty requirements the next question would be, is the invention obvious?

In order to obtain a patent an invention must be unobvious. Section 25(10) of the Patents act explains that an invention will be considered unobvious or involving an inventive step *“if it is not obvious to the person skilled in the art, having regard to any matter which forms, immediately before the priority date of any claim to the invention, part of the state of the art”*. This essentially means that if the improvement to an invention is so small that any person involved in that field could easily have thought of the invention than the invention is ‘obvious’. In terms of the *Sutherlandia* and other traditional knowledge, the question that needs to be asked is whether the invention is obvious. The knowledge that identifies a specific plant capable of treating specific conditions appears to satisfy the inventiveness criterion. Traditional knowledge should be able to meet the inventiveness criteria.

As with novelty the inventiveness requirements could provide some protection to traditional knowledge. It could be argued that bio-prospectors who develop products (tablets, gels etc.) based on traditional knowledge are developing ‘obvious’ products and do not meet the requirement of inventiveness. It could also be argued that products based on traditional knowledge do not involve an inventive step given that they are based on compounds that already existed in nature. It could thus be argued that commercial enterprises did not invent the compound but merely discovered the compound albeit in a different form. However, as Gernholtz (undated) states “the term ‘obviousness’ is easy to use, difficult to define. And at times its existence is impossible to prove”. Given this difficulty and cost considerations patent applications are often filed even though inventiveness is in doubt. In addition, traditional communities wishing to use the argument of ‘obviousness’ to have a patent revoked are also required to provide proof to this effect. The onus of proving ‘obvious’ would therefore rest with the traditional communities, as would the associated costs of litigation.

(c) Inventors and ownership

The strongest argument against patent protection for traditional knowledge is that the Western concept of property that underpins patent legislation is not suited to the protection of traditional knowledge (Toffel 2002). A core component of this argument is based on the disparate concept of invention and ownership of the two systems (table.4.1)⁷⁵, with the Western system embedded in a culture of private invention or individualistic innovation whilst traditional ownership is embedded in a culture of communal or collective invention. Basalla (1988:61) as cited by Brush (1996 (a)) argues that the patent system obscures the collective base of invention and “distorts the extent of the debt owed to the past by encouraging the concealment of the network of ties that lead from earlier, related artefacts.”

In terms of South African legislation, Section 27 (1) of the Patents Act states “*an application for a patent in respect of an invention may be made by the inventor or by any other person acquiring from him the right to apply or by both such inventor and such other person.*” Gernholtz (undated) interprets this section as meaning that four groups of people are eligible to apply for a patent:

- The inventor or inventors alone;
- The inventor or inventors jointly with one or more other persons, i.e. assignees;
- The assignee or assignees of the inventor or inventors, to whom the rights have been assigned;
- The legal representative of a deceased applicant or an applicant who is under legal disability.

The complexity of identifying an inventor for traditional knowledge poses the greatest difficulty for using the patent mechanism to protect traditional knowledge. Toffel (2002) argues that an even if a specific inventor was identified there still remains the conflict between invention and ownership. Hoppers (2002:3) argues against patents on the basis that in terms of the TRIPs agreement, “...the WTO legislates the idea of intellectual property rights (IPRs) in a manner that assumes individual ownership (a Western phenomenon) as a universal phenomenon, and excludes the notion of ‘collectivity’ that characterises ownership of IPRs in many societies in the Third World. [Furthermore] ...too many existing IPR systems are focused on private

⁷⁵ Table 4.1 summarises the different values that underpin the system of patents and those that underpin traditional knowledge.

ownership, and are at odds with indigenous cultures that emphasise collective creation and ownership of knowledge.”

The *Sutherlandia*, with its history of use across a number of different communities, highlights this problem to some extent. Should the traditional knowledge of the plant be credited to the Zulu, Xhosa, Setswana or Afrikaans communities? Further difficulties arise in identifying groups within a given community. Which group or sub-community within these larger communities should be designated as the inventor thus entitling them to the benefits of patent protection? What should the criteria be for determining such groups? Toffel (2002:23) cites Dutfield (1999) who explains, “A great deal of traditional knowledge cannot be traced to a specific community or geographical area. Thus no identifiable group of people may exist in which rights to such knowledge can be vested.”

Although Section 29(1-4) of the Patents Act does provide for joint ownership of rights in patent applications, the nature of ownership and innovation in traditional communities still poses significant challenges. The most notable amongst these is the problem of “intergenerational inventor” (Toffel 2002). In addition to the problems discussed above the development of traditional knowledge also poses problems. Traditional knowledge is developed over generations through collaborative efforts with communities using and building on the knowledge handed down to them through generations. Given that patents are exclusive rights, should the knowledge of the *Sutherlandia* be attributed to a present day community knowing that this knowledge was held and developed by a prior community⁷⁶? Traditional knowledge emerges through generations and involves many people. The inventor is thus a chain of people and not a single identifiable individual or group at a point in time. In addition patent protection is time limited for a period of twenty years. Upon completion of the twenty years the patent lapses and the invention is no longer protected. This is in direct contrast to the nature of traditional knowledge, which is held in perpetuity. Affording patent protection to a specific individual or group for a limited duration runs contrary to the values of traditional communities and may undermine the very nature and existence of traditional knowledge (Brush 1996 (a)).

⁷⁶ Toffel (2002) notes that the transmission of traditional knowledge poses a paradox for the requirement of novelty. Because traditional knowledge is handed down from one generation to another it may not meet the novelty requirement because the knowledge is not novel to the community that currently possesses it.

A patent provides temporary protection to an inventor. A patent grants an inventor an exclusive right to the invention. This includes the right to exclude others from marketing, using, exercising or disposing of the invention (negative right) as well as the right to enjoy the whole profit and advantage accruing by reason of the invention (positive right) (Section 45(1)-(2) of the Patents Act). This protection is reward for innovativeness and is believed to encourage further inventions. This is in contrast to traditional communities where innovations are often freely shared and innovation is driven not by reward but by survival or sustenance.

(d) Costs

The South African patent system makes provisions for three types of patent applications, namely a provisional patent application, a complete patent application and an application in terms of the Patent Cooperation Treaty (PCT) (Fenyane 2003). A provisional and complete application deals specifically with patents in a national (i.e. South African) context whilst a PCT application relates to patent protection in terms of the International Patent Convention, South Africa being a signatory to the convention.

Applicants in South Africa are in the fortunate position of having recourse to a range of patent applications each at a different cost. Section 32(2) of the Patents Act sets out the requirements for a provisional application. This form of application is the least complex and least expensive⁷⁷ and can be filed without the aid of a patent attorney. Although relatively inexpensive⁷⁸ a complete patent application has to be signed by a patent attorney (Section 96). Attorney fees are a significant additional cost that needs to be considered when filing such an application. A PCT is the most expensive application and comprises a two-phase process, each with its own costs⁷⁹.

Cost constraints for communities seeking patent protection within South Africa are not significant. However, the threat posed to traditional knowledge is not confined to South Africa and has an international dimension. Communities therefore require protection against appropriation from both national and international threats. Such extensive protection carries a high financial burden for communities who usually lack the technical and financial resources to acquire such protection. It is also important to note

⁷⁷ Fenyane (2003) states that a provisional patent application can be filed at a cost of R60 in revenue stamps.

⁷⁸ Cost of R266 in revenue stamps (Fenyane 2003).

⁷⁹ The first phase is the national application at a cost of R6000, followed by an application in the convention country where protection is sought (cost depends on rates within country) (Fenyane 2003).

that any form of patent protection, whether national or international, involves high transaction costs. Even though an application may be inexpensive there still remain costs associated with monitoring and ensuring compliance, challenging parties who infringe the patent and defending the patent against challenges and re-examinations. These costs often prove much greater than the cost of the initial application (Toffel 2002). Costs therefore do act as a significant constraint on communities who seek to use the patent mechanism to protect their traditional knowledge.

4.4.2 TRADEMARKS AND GEOGRAPHICAL INDICATIONS

Traditional communities are faced with significant constraints when attempting to acquire patent protection. The difficulty of acquiring such protection leads commentators to argue that the current IPR regime is not able to protect traditional knowledge (Patel 1996, Steven, Carlson and Moran 1996, Wynberg 1998). These criticisms tend to focus only on patent protection and largely ignore the potential of other IPRs as protection mechanisms for traditional knowledge. Two other categories of IPRs cited as being suited to the protection of traditional knowledge are trademarks and geographical indications (Downes and Laird 1999, Toffel 2002, Tansey 1999). The TRIPs agreement recognises these as distinct categories and contains specific provisions relating to them. Articles 15-21 and Articles 22-24 deals with trademarks and geographical indications (GI) respectively. Although South African IP legislation makes no special provisions for the protection of GI, this category of rights can be protected under existing trademark and business practice legislation. The most important legislation for trademarks and GI is the Trade Marks Act 194 of 1993 and the Merchandise Marks Act.

What is the value of a trademark or a GI to traditional knowledge holders and how can these be used protect traditional knowledge? In order to answer these questions it is necessary to understand the practical functions that they serve and the manner in which they are able to serve the interests of traditional knowledge holders. Gernholtz (2003)⁸⁰ explains that in practice trademarks fulfil the following functions:

- Identify: trademarks identify the manufacturer or suppliers of particular goods and services.

⁸⁰Gernholtz (2003) available at <http://gpa/english/basic/tm.htm>- Page references not available on web document.

- Distinguish: it distinguishes goods or services from those from those of competitors.
- Guarantee: it acts as a guarantee of a particular quality or character of the goods or services.
- Advertising: it assists in advertising goods and services.

The above description indicates that a trademark is essentially a marketing tool that is based on claims to the authenticity and distinctiveness of products. The same can be said for GI.

Section 2(1)(xiii) of the Trade Marks act defines a trademark⁸¹ as “*a mark used by a person in relation to goods or services for the purposes of distinguishing the goods or services in relation to which the mark is used or proposed to be used from the same kind of goods or services connected in the course of trade with any other person*”. Trademarks play a vital role in modern business. Gernholtz (2003) states “trademarks are commercial symbols, which are essential in modern trade and business”. They serve to identify goods and to distinguish particular goods and services from other goods and services, thus making them a valuable marketing tool. Trademarks also often act as an indication for the quality of goods and services. The value of trademarks as a marketing tool makes their protection important.

Downes (1997:11) suggests that trade marks could be valuable to traditional communities who seek “to gain economic benefits from their traditional knowledge, or seek to prevent its objectionable commercial use by outsiders”. Downes and Laird (1999) argue that because trade marks assure consumers that a good has been produced in a certain manner, trade marks held by traditional communities can serve as a guarantee to consumers that a good based on traditional knowledge has been produced in a traditional and sustainable manner on the basis of their traditional knowledge. This they argue could stimulate markets for products derived from local biodiversity and based on traditional knowledge.

Toffel (2002) suggests that trade marks are valuable to traditional knowledge holders as a means of acquiring compensation and controlling the use of their traditional resources. These benefits accrue to traditional knowledge holders because of the exclusive right of use that a trademark confers to its owner/s⁸². Trademarks are also

⁸¹ This definition excludes certification and collective trademarks.

⁸² Article 16 of the TRIPs agreement states “the owner of a registered trademark shall have the exclusive right to prevent all third parties not having the owner’s consent from using in the course of trade identical

valuable to traditional knowledge holders because of the potential they have to be held in perpetuity. In terms of legislation a trademark is granted for a period of ten years but unlike patents, trademarks can be renewed upon expiry. Article 18 of the TRIPs agreement also requires that member states provide for trademarks to be renewable indefinitely thus creating the potential for them to be held in perpetuity.

Does the South African IP system allow traditional knowledge holders to access these benefits? Section 9(1) of the Trade Marks Act defines a registrable trade mark as “*capable of distinguishing the goods and services of a person in respect of which it is registered or proposed to be registered from the goods or services of another person either generally or, where the trade mark is registered or proposed to be registered subject to limitations, in relation to use within those limitations*”. Registering a trademark with the South African Patent and Trademark Office (ZAPTO) guarantees the trademark owner exclusive rights over the use of such a trademark. Unregistered trademarks⁸³ are also recognised under common law. Although unregistered trademarks are recognised they do not guarantee protection and infringements of the mark have to be challenged on the basis of a “passing off”⁸⁴ action, which is often difficult to prove (Gernholtz 2003).

Section 10 of the Trade Marks Act provides a list of marks, which are un-registrable⁸⁵. Included in this are marks which “*consist(s) exclusively of a sign or an indication which may serve, in trade, to designate the kind, quality, quantity, intended purpose, value, geographical origin or other characteristics of the goods or services, or the mode or time of production of the goods or of rendering of the services...*”. This provision excludes geographical origin and production methods as registrable marks. In terms of the traditional knowledge of the *Sutherlandia*, which occurs in certain parts of the Western Cape among certain traditional communities, is used as a medicinal treatment and is produced by communities using traditional and sustainable methods of production, it would appear that communities will not be able to register a trademark for the plant and thus their traditional knowledge in terms of section 10 of the Trademarks Act. Traditional communities are thus excluded from using this approach

or similar signs for goods or services which are identical or similar to those in respect of which the trademark is registered where such use would result in a likelihood of confusion.”

⁸³ Protection for a trademark that has not been registered can be obtained if the mark has been extensively used and as result of this use has acquired a reputation.

⁸⁴ A passing off action is instituted on the basis that another party has infringed a trademark by passing off their goods or services as being the goods and services of the owner of the trademark.

⁸⁵ An unregistrable trademark differs from an unregistered trademark, the former not being eligible for registration in terms of statute whilst the latter is eligible for registrations but is not registered.

for protecting their traditional knowledge but do have recourse to other forms of protection in terms of the Trade Marks Act. These include protection in terms of Section 42 and 43 of the Act, which provides for certification and collective trademarks respectively.

Section 42(1) of the Trademarks Act defines a certification trade mark as “*a mark capable of distinguishing, in the course of trade, goods or services certified by any person in respect of kind, quality, quantity, intended purpose, value, geographical origin or other characteristics of the goods or services, or the mode or time of production of the goods or of rendering of the service, as the case may be, from goods or services not certified...*”. Downes and Laird (1999)⁸⁶ cite Blacks law dictionary, which explains the use of certification marks as “used upon or in connection with the products or services of one or more persons other than the owner of the mark to certify regional or other origin, material, mode of manufacture, quality, accuracy or other characteristics of such goods or services [to certify] that the work or labour on the goods or services was performed by members of a union or other organisation.” Certification marks relate to goods with particular characteristics or qualities, and these attributes are communicated to the consumers through the certification mark. A certification mark is registered in the name of a certification authority or body. This body is required to submit the rules that govern the use of the mark with its application. The result is that products that conform to the rules of the certifying body are eligible to be to be certified and thus carry the certification trademark.

A collective trademark is defined as “a mark capable of distinguishing, in the course of trade, goods or services of persons who are members of any association from goods or services of persons who are not members thereof...” Downes and Laird (1999) explain that collective marks are “trademarks or service marks used by the members of a cooperative, an association or other collective group”. A collective trademark is filed in the name of an association. The application has to be accompanied by a set of rules that govern the use of the mark. These rules have to specify the conditions of membership of the organisation, the persons authorised to use the mark and the conditions for use of the mark. An example of this may be an association of producers of medicinal products based on traditional knowledge of *Sutherlandia*. These producers may register a collective trademark based on production methods and products that are developed from that plant. Any products developed (e.g. tablets, gels, tonics etc.) by producers

⁸⁶ No page references available in document.

within that association could then be promoted using the mark. The distinction between collective and certification marks is that collective marks are used by members of an association who own the mark to market their product whereas certification marks are used in connection with products to certify origin, or production methods or materials. Using these marks to protect traditional knowledge can often blur this distinction because these marks are both used as a type of guarantee to assure consumers that a product is produced in a specific manner or is of a certain quality.

Certification and collective trademark legislation also forms the basis of South African protection of geographical indications. Section 42 of the Trademark Act mentions geographical origin as registrable as a certification mark in distinguishing products. In terms of Section 43(2) “*geographical names or other indications of origin may be registered as collective trade marks*”. Geographical indications (GI) are therefore marks that distinguish products on the basis of their geographic origin.

The functioning of a geographical indication to protect traditional knowledge can be explained as follows. A community within a determinable geographic location that possess the traditional knowledge registers a collective or certification trademark in respect of products based on a particular aspect and application of traditional knowledge for the production of goods within the region. These producers then acquire the exclusive right to use this mark and are entitled to restrict others from using this mark. The value of this to producers is when the region and traditional knowledge comes to be associated with quality, reputation or other characteristics of the goods produced. The GI then becomes a valuable marketing tool for traditional knowledge holders.

Extending this analysis to the *Sutherlandia* the following emerges. Existing trademarks for *Sutherlandia* exist in South Africa. This trademark is a certification trademark for products based on *Sutherlandia Frutescens* subspecies *microphylla* elite (PN1™) chemo type (Suthrlandia.org 2003). The *Sutherlandia* website reports “the only brands that we are aware of that use this elite chemo type are Big Tree African Ginseng™, Big Tree Sutherlandia, and Phyto Nova Sutherlandia.” Each of these companies uses this particular subspecies to manufacture medicinal products. The trademark distinguishes their products from the products of competitors that also use the *Sutherlandia* as an ingredient. The only recourse such companies currently have to IP protection for the products they develop are recourse to trademark protection (Feiter 2003). The registration of these trademarks does not pose a threat to traditional knowledge holders

since traditional communities are not excluded from promoting products based on their traditional knowledge of the plant, nor are they prevented from acquiring a trademark of their own. Downes (1997:11) suggests that the creation of systems of GI and trademarks is likely to bring economic rewards to communities “seeking to market products based on traditional production practices” because this system of protection is more suited to traditional knowledge than other forms of IP protection.

A significant point that emerges from the above analysis is that this form of protection is more suited to overcoming the problems associated with identifying ownership than patents are. This is highlighted in table 4.2. If properly managed, a community would be able to identify goods based on their traditional knowledge irrespective of geographic location or the existence of smaller groups within the larger communities, provided each such community or group is able to meet the requirements set out by a governing body or umbrella organisation. In the instance of the *Sutherlandia* this could be depicted as follows: a governing body consisting of representatives of several traditional communities establishes a collective trademark for traditional products (not necessarily a medicinal product). In addition they establish regulations on the production and marketing of such products and set out requirements that need to be fulfilled in order to qualify for the use of the trademark. All communities able to comply with stipulated regulations and requirements will then be afforded the opportunity to use the trademark as a marketing tool in promoting the products they develop (Downes and Laird 1999). This allows the communities to maintain their knowledge in a traditional manner and receive recognition for their knowledge and also provides a guarantee that the products carrying the mark are traditionally produced.

The benefits of GI and trademarks of this nature differ significantly from those of the patent system. In contrast to the patent system with its utilitarian justification and its granting of a monopoly right to the inventor as a reward for encouraging innovation, GI are not specifically designed to reward innovation. Instead of rewarding innovation GI and trademarks reward consistency. Downes (1997:11) explains that GI and trademarks are designed to reward “goodwill and reputation” that producers acquire over a long period of time because of their geographic location and the practices “associated with that region and its culture, customs and communities.” Downes and Laird (1999) indicate that because GI are so dependent on the land and culture of a particular region for value, this land and culture has to be emphasized, promoted and maintained. This is

consistent with the practices of traditional knowledge holders who emphasise the interconnectedness of culture, land and resources.

Table 4.2 Embeddedness across systems

	Patent System	Trademarks and geographical indications	Traditional knowledge
Motivation	Incentive, reward to innovator, utilitarian considerations, encourage innovative production	Encourage maintenance of practices and quality, preserves local practices associated with reputation	Survival and sustenance, cultural dimension and sustainable development, preserve traditional practices
Inventor	Clearly identifiable inventor or inventors	Association of producers, community of producers	Intergenerational invention, no single inventor identifiable
Ownership	Individualistic approach, private property and exclusive rights	Communal ownership, members of association acquire right to use but not transfer	Holistic, Common heritage of mankind, communal possession
Invention	Benefits accrue to inventor and if commercialised society benefits	Benefits accrue to producers in association, community of associated region	Benefits entire community
Records	Invention recorded in written format	Mark recorded in written format, practices documented to ensure compliance by producers	Recorded in folklore, customs and practices

Establishing this type of protection requires co-operation and a collective decision-making process, which is consistent with the traditional practice of communal decision-making. The problems of assigning ownership are also largely overcome with this form of protection. Each community (E.g. Xhosa, Zulu, Afrikaans) would be able to register their own trademarks based on their particular traditional knowledge, their practices, or geographic location. Alternatively, traditional knowledge holders from various communities in a specific geographic location could form an association and register a certification mark that can be used as a GI on products developed using the traditional

knowledge of a particular plant⁸⁷ (*Sutherlandia*). Each community represented in the association is entitled to use the mark when promoting the products they develop. No one community or individual is recognised as the owner of the mark and it is shared between producers in the region or producers who adopt agreed upon production processes.

A mark of this sort is thus not freely transferable (Downes 1997) and in this way GI or trademarks reflect an accommodation of the concept of communal ownership and is not limited to private property. A further advantage is that a GI can be maintained in perpetuity, making it consistent with the nature of traditional knowledge that is held in perpetuity. The GI will continue to exist for as long as the collective tradition remains. Communities that transmit traditional knowledge from generation to generation can preserve traditional knowledge and practices by preserving the collective tradition that forms the basis of the GI.

Communities wishing to register trademarks are also not hampered by excessive cost constraints. The cost of registering a collective or a certification trademark in South Africa is R310-00 (Du Plessis 2003). This does not however take into consideration attorney costs that often exceed this level and may prove a significant cost constraint. In addition costs associated with monitoring and protecting the mark against infringements are significantly higher than the cost of acquiring a trademark, and these costs may indeed be a constraint to traditional communities seeking to acquire trademarks based on their traditional knowledge.

On the basis of the above analysis the value of GI and trademarks appears to contradict the view that that the existing IPR system is ill equipped to deal with the protection of traditional knowledge (Patel 1996, Wynberg 1998, Brush 1996 (a)). However, as the analysis reveals, these tools of protection do not protect the knowledge as such but the products resulting from the application of such knowledge. In the absence of the products being developed that can benefit from trademark and GI protection the knowledge of traditional communities remains under threat of appropriation. The effective use of these mechanisms to protect traditional knowledge is dependant on the capacity of traditional communities to develop marketable products. In a similar fashion to patents, these mechanisms only function if traditional knowledge holders have the capacity and resources with which to develop and commercialise their knowledge.

⁸⁷ This would be done as was described for a certification mark.

Trademarks and GI function as stores of information which consumers refer to in order to establish the quality or characteristics of products. However, these marks are not unambiguous stores of information but only provide hints and signs that consumers interpret based on knowledge they already possess (Gallagher 2002). These marks only provide a guide as to the origins of the product, and even if a mark is associated with a consumer belief about production methods and quality, a trademark offers no guarantee of quality of production methods. These perceptions rest on a conceptual framework that the consumer already possesses. In addition to being able to develop products, traditional knowledge holders wishing to benefit economically from trademarks and GI will need to develop a mark that is recognisable by consumers thus making such a mark valuable. The constraints facing communities seeking to use these mechanisms to protect their traditional knowledge may not be their suitability but rather the ability of the communities to access the full benefits associated with these mechanisms.

4.4.3 TRADE SECRETS

Article 39 of the TRIPs agreement requires member countries to protect undisclosed information or trade secrets. Trade secrets could potentially provide the greatest level of protection for traditional ethnobotanical knowledge. Article 39(c) of the TRIPs stipulates that this form of protection can be used if the knowledge “has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret.” This article indicates the fact that trade secrets by their very nature only provide protection for as long as the practice or knowledge remains a secret. This category of right may offer the best means of protection for traditional knowledge holders provided that the traditional knowledge remains a secret or the process of “reverse engineering” is not able to reveal the active compounds in the products developed by traditional knowledge. If such knowledge is revealed or discovered trade secret protection cannot prevent other parties from exploiting such knowledge for their own benefit.

It would appear that trade secret protection could not be applied to the *Sutherlandia* given the publicity the plant has received and the extensive documented knowledge of its medicinal application. However, if a traditional community possessed knowledge on a novel medicinal application, trade secret protection could provide a means of protection.

As with trademarks, trade secret protection is only relevant if traditional knowledge holders are able to develop and commercialise products based on their knowledge. The potential for this form of protection being used is limited by the capacity of communities to develop commercially viable products based on their traditional knowledge. In addition, this form of protection may run contrary to traditional practices, given that most communities practice sharing of knowledge and consider resources to be part of the common heritage of mankind. Trade secret protection would therefore run counter to the cultural practices and in many instances the religious beliefs of traditional communities (Halewood 1999).

4.4.4 COPYRIGHTS

Section 2 of the Copyright Act 98 of 1978 stipulates that literary works, musical works and artistic works are eligible for copyright protection. Copyright protection affords the copyright holder exclusive control over the use and distribution of materials. Section 1(1)(xxviii) of the Act gives a list of ‘literary works’ and states that these include “irrespective of literary quality and in whatever mode or form expressed”:

- novels, stories and poetical works;
- dramatic works, stage directions, cinematograph films, scenarios and broadcasting scripts;
- textbooks, treatises, histories, biographies, essays and articles;
- encyclopaedias and dictionaries;
- letters, reports and memoranda;
- lectures, speeches and sermons;
- tables and compilations, including tables and compilations of data stored or embodied in a computer or a medium used in conjunction with a computer.

Artistic works include paintings, sculptures, drawings, engravings and photographs. (Section 1(1)(iii)).

Traditional knowledge is often maintained through stories, in music or poetry or in drawings that comprise the folklore of traditional communities. This folklore is eligible for copyright protection provided it complies with legislative requirements. The most important provision in this regard is that such folklore must be “*written down*,

recorded, presented in digital data or signals or otherwise reduced to a material form” (Section 2(2)). Copyright protection can be obtained by simply documenting traditional knowledge, with no registration being required. This makes this form of protection easily accessible to traditional knowledge holders.

As with other categories of rights, copyright protection merely protects the unauthorised use or distribution of the copyrighted material and does not protect the traditional knowledge itself. Traditional knowledge may still be appropriated without the copyright being infringed. In addition copyright protection also poses the constraints of identifying an owner of the copyright. Finally, copyrights are also time limited and may not be renewed upon expiry. These constraints are similar to those discussed for patents.

4.5 CONCLUSIONS

In this chapter, South African intellectual property legislation was applied to an indigenous plant that has traditionally been used for its medicinal properties. The protection provided by IPRs was tested by applying relevant legislation to the traditional ethnobotanical knowledge of the *Sutherlandia Frutescens* held by communities in South Africa. The analysis incorporated patent legislation, plant variety protection, trademarks and geographical indications, trade secrets and copyright legislation.

The analysis was directed at determining the feasibility of employing these categories of rights as tools for protecting traditional knowledge. Greatest attention was given to patent protection since this category holds the greatest implications for traditional knowledge (both in terms of opportunity of securing rights for communities and as a threat to traditional knowledge as well as in terms of international regulation-Article 27(3)(b) of the TRIPs Agreement). This analysis was not intended to suggest solutions (these are dealt with in chapter six) but merely to identify the scope of protection and the problems associated with applying existing IPRs to traditional knowledge.

Applying relevant legislation to traditional knowledge of the *Sutherlandia* revealed the following:

- a) Plant variety protection - The Plant Breeders Rights Act of 1976 does not provide protection since the *Sutherlandia* is not a new plant variety.

- b) Patent protection - requirements regarding novelty, inventiveness and inventors pose significant challenges to communities wishing to acquire patents to protect their traditional knowledge. In addition to these, cost considerations limit the potential of communities to access this protection mechanism. However, the stringent requirements of patentability does provide for opportunity for defensive protection. Communities can use these requirements to prevent other parties from acquiring patents and thereby appropriating their traditional knowledge.
- c) Trademarks and GI - Trademark and GI protection do not provide protection for the traditional knowledge itself but only for a mark associated with such knowledge. The value of these instruments to traditional communities rests in their use as marketing tool rather than as instruments of protection through securing rights over knowledge. The marketing value of a mark can also serve to ensure that traditional practices are encouraged, thereby preserving traditional knowledge.
- d) Trade secrets - trade secret protection provides the best instrument for protecting traditional knowledge. However, its protection is subject to the knowledge remaining secret. If other parties discover this knowledge or if it is revealed in some manner this instrument cannot prevent other parties from exploiting the knowledge. The extent of protection provided by this instrument is therefore limited.
- e) Copyright - This form of protection can be used by traditional communities. It requires documenting knowledge and provides communities with rights over the use and distribution of the said document. Copyright protection is limited since it does not preclude the possibility of other parties using the knowledge contained in a document. Traditional knowledge can still be appropriated without infringing the copyright. Difficulties in identifying owners and time limitations also severely curtail their potential as an effective protection mechanism. In addition, acquiring copyright protection for documented traditional knowledge foregoes any possibility of communities' subsequently acquiring patent rights over such knowledge.

CHAPTER FIVE

ALTERNATIVE SYSTEMS OF PROTECTION AND THE PROTECTION OF TRADITIONAL KNOWLEDGE IN THE WESTERN CAPE

Indigenous flora and fauna is inextricably bound to the territories of indigenous communities and any property right claims must recognise their traditional guardianship. Commercialisation of any traditional plants and medicines of indigenous peoples must be managed by the indigenous peoples who have inherited such knowledge.

[Matataua Declaration-New Zealand 1993]

5.1 INTRODUCTION

Thus far, this analysis has concentrated on existing IPRs as a mechanism for protecting traditional knowledge. However, these are not the only options for the protection of traditional knowledge. A significant number of countries, organisations and regional organisations have developed unique systems of protection for traditional knowledge that do not rely exclusively on IPRs. Such systems are termed *sui generis* systems. Some of these systems are intimately related to and modelled on existing categories of IPRs whilst others are not. Their uniqueness stems from their different conceptions of property and ownership and being designed to address the specific needs of knowledge holders. These systems are also often intimately related to biodiversity and plant variety protection.

This chapter introduces several alternative systems of protection and highlights the manner in which they offer protection to traditional knowledge. *Sui generis* systems as an alternative to existing IPRs categories of protection are introduced and discussed. Common features are identified and these are then contrasted to the protection afforded by existing IPRs. The protection provided by these systems is then contrasted to the protection afforded by existing IPRs in South Africa. This is done to determine the extent to which IPRs serve the interests of traditional knowledge holders and communities in South Africa in contrast to alternative systems. No attempt is made at developing a novel system of protection.

The next section extends this investigation by examining the mechanisms available for protecting traditional knowledge in the Western Cape Province. This discussion also serves to provide a platform for the recommendations made.

5.2 ALTERNATIVE SYSTEMS OF PROTECTION

A central issue in the debate on traditional knowledge and IPRs relates to the access to traditional knowledge and associated resources as well as ensuring that communities are recognised for and benefit from any commercial exploitation of their knowledge. The concern that existing IPRs on their own do not provide a satisfactory level of protection for traditional knowledge has led several nations to consider alternative systems of protection that address the particular concerns of indigenous communities. The two most important concerns are the right to control access to and the right to benefit from any commercial exploitation of their knowledge and resources⁸⁸.

5.2.1 *SUI GENERIS* PROTECTION

As was explained earlier, *sui generis* is a Latin phrase meaning “of its own kind.” A *sui generis* system of protection would therefore mean a system specifically designed to address the needs and concerns of a particular issue⁸⁹. A system for traditional knowledge would therefore mean a system of protection specifically designed to address the needs and concerns of communities that possess traditional knowledge. Being a specifically designed system, a *sui generis* system could be entirely different

⁸⁸ These concerns are considered most important since they are the concerns reflected in the CBD provisions requiring prior informed consent and benefit sharing agreements.

⁸⁹ An example of one such system is the geographical indications system of the European Union (EU) which addresses the particular needs of the region. The EU makes provision for three categories of products, which qualify for protection, these include:

- **PDO** (Protected Designation of Origin) - this is a term used to describe foodstuffs that are produced, processed and prepared in a given geographical area using recognised know-how.
- **PGI** (Protected Geographical Indication) - for a product to qualify for this form of protection, the geographical link must occur in at least one of the stages of production, processing or preparation.
- **TSG** (Traditional Speciality Guaranteed) – this form of protection highlights the traditional character of the product, either in the composition thereof or in the means of production.

The EU argues for these systems of protection as a means of:

- Encouraging diverse agricultural production
- Protecting product names from misuse and imitation
- Helping consumers by giving them information concerning the specific character of a product.

The TSG differs notably from the other systems in that it does not refer to origin as a qualifying criterion for protection but only focuses on character, composition or production. (http://europa.eu.int/comm/agriculture/qual/en/ibbbl_en.htm) (20/09/2004).

from the prevailing IP system or it could be a system based on the IP system but tailored to the issue of traditional knowledge⁹⁰. Article 27(3)(b) of the TRIPs Agreement makes provisions for member states to develop a *sui generis* system of protection. However, this provision allows for developing such a system for the protection of plant varieties and not traditional knowledge. A system for plant variety protection may address several important traditional knowledge concerns but the system itself would be designed specifically for the protection of plant varieties. Discussions on *sui generis* protection for traditional knowledge should therefore not be confused with the *sui generis* provision contained in Article 27(3)(b) of TRIPs.

Several examples of *sui generis* systems for the protection of traditional knowledge exist. Most of these systems are developed at national level and use mechanisms closely related to IPRs. Since these are systems specifically designed to address issues relating to traditional knowledge, they tend to be closely related to or developed in conjunction with regulations governing access to genetic resources and benefit sharing. Many of the systems therefore form a part of larger systems promoting the protection of biodiversity or plant varieties. An UNCTAD (2000) document explains that accommodating such a system may also require a review of regulations and policies that govern natural resources, IP, environmental protection and land tenure. The impact of *sui generis* protection on other policies and regulations is beyond the scope of this study and is not attempted. Nevertheless, it should be remembered that these systems do not exist in a vacuum.

The choice of systems analysed is representative of a spectrum of systems developed at different levels. These include national governments (Costa Rica, Philippines and India (ii)), NGOs and local communities (Pacific Islands and India (i)) and regional unions

⁹⁰ The TSG differs notably from the other systems in that it does not refer to origin as a qualifying criterion for protection but only focuses on character, composition or production. This represents an instance where a *sui generis* system of protection for traditional products is based on protective measures for geographical indications. In addition, within the EU the systems of protection are so closely related that the procedural requirements for registering a product and thereby acquiring protection (whether for a PDO, PGI or TSG) are exactly the same (this serves to reduce transaction costs). Producers are required to:

- Define the product according to precise specifications
- Submit the application (including specifications) to the relevant national authority

The application is then studied and transmitted to the commission:

- The application then undergoes a number of control procedures.
- If the necessary requirements are met, a first publication in the Official Journal of the European Communities will inform those in the Union who are interested.
- If there are no objections, the European Commission publishes the protected product name in the Official Journal of the European Communities.

(http://europa.eu.int/comm/agriculture/qual/en/ibbb1_en.htm) (20/09/2004).

(African Union)). No international system exists. The choice is also limited by the appropriateness to the discussion⁹¹ and the availability of information.

(a) Pacific Islands model law

The Pacific Island Model Law for the Protection of Traditional Ecological Knowledge, Innovations and Practices (Act 200X) provides an example of one such *sui generis* system. This model law was developed by NGO's in conjunction with local communities. The scope of the act extends beyond knowledge and encompasses products (i.e. innovations) and practices based on that knowledge. This system emphasises that all traditional knowledge is owned (Article 5), therefore it cannot be claimed that traditional knowledge, innovations and practices are ownerless. Accepting ownership moves traditional knowledge out of the area of 'common heritage' and into the realm of private property. However, the model law recognises that this may be inconsistent with traditional culture and beliefs and therefore defines the term 'own' broadly: "own means to belong-as this word is understood to the culture or rules of the relevant individual, entity or group-to that individual, entity or group...[furthermore] the term 'own', depending on the cultural context, can signify not only total control but different forms of control such as trusteeship, custodianship, stewardship etc." (Article 2). This system provides for the protection of traditional knowledge through the creation of a national register (Article 9). In addition, the commercial use of traditional knowledge is regulated (Article 10). This protection is provided through provisions requiring parties to secure prior informed consent (Article 10(1)(a)) and negotiate benefit-sharing agreements (Article 10(1)(b)). This system makes no explicit mention of any of the existing categories of IPRs but styles itself along the lines of the Third World Networks model "Community Intellectual Rights Act of 1994" that focuses on plant varieties only.

(b) Costa Rica

The Costa Rican government adopts a similar approach in their Biodiversity Law⁹² requiring parties to obtain prior informed consent (Article 63(1) and Article 65). This

⁹¹ What this implies is that systems focussing exclusively on traditional knowledge were preferred to systems that contain traditional knowledge as a part of a broader strategy (e.g. systems promoting plant variety protection with a traditional knowledge component).

⁹² The Legislative Assembly of the Republic of Costa Rica, Decree 7788.

system also empowers traditional communities by recognising ‘a right to cultural objection’. This provision recognises the right of traditional knowledge holders to oppose access to their knowledge “be it for cultural, spiritual, social, economic or other motives.” (Article 66). This system does not provide for the development of a registry or database documenting traditional knowledge.

(c) India

- (i) The Biodiversity Related Community Intellectual Rights Act is a model *sui generis* system developed by local communities and NGO’s to address the concerns of traditional communities in India. Clause 2, which sets out the extent of coverage, states that the act covers the whole range of life forms, “including plants, animals and other microorganisms.” This Act explicitly recognises both the concept of collective ownership (Clause 7) and co-ownership (Clause 8) that characterises community systems. This Act also stipulates that commercialisation of traditional knowledge or an IPR claim on traditional knowledge of a resource is subject to the requirements of prior informed consent and benefit sharing (Clause 10). Clause 10 does however differ from the other systems described above in that it requires that the community in partnership with the state to determine access to traditional knowledge and resources. This is viewed as a provision that balances the power in negotiations between communities and commercial entities. Clause 11 of the Act provides for the establishment of a community biological diversity register that is to be maintained by a central authority as well as at a “state, district and village level.” (Clause 11(i)). The significance of this registry is explained by Clause 11(ii), which provides that these registers are to be used to establish and recognise “the community or ‘communities’ ownership right to the resource and/or innovation.”
- (ii) The Karnataka Community Intellectual Rights Act (Draft) of 1994 is described as an ‘Act to provide for the establishment of a *sui generis* system in respect of plant varieties’. As with the other systems described above this system requires parties wishing to use traditional knowledge and resources for commercial purposes to secure prior informed consent (Section 5(1)) from the relevant community. This Act also provides for benefit sharing agreements but in contrast to the other systems establishes a minimum level

for benefit sharing. Section 5(2) of the Act stipulates that any party using traditional knowledge innovations for commercial uses “shall pay to the local community which is the custodian or steward of the said innovation a sum representing not less than twenty per centum of the gross sales of any product or process incorporating the said innovation.” A community may also opt for “a non-monetary equivalent” (section 5(3)). Stipulating a minimum level for benefit sharing significantly extends the protection afforded to communities but may also act as a significant deterrent to investment in commercialising the knowledge of those communities. This act also provides for the creation of a “registry of innovation” (Section 7) allowing communities to register their knowledge and innovations thus securing identification as custodians of the knowledge or innovation.

(d) Africa

In 1998 the then Organisation for African Unity (OAU)⁹³ drafted the “African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulations of Access to Biological Resources”. This model legislation lists as a specific objective the recognition, protection and support of the rights of communities over their knowledge (Part 1, supra note (a)). Article 3(1) and Article 18 contain the important provisions that state “any access” to resource and knowledge of local communities is “subject to an application for the necessary prior informed consent and written permit.” This provision differs from prior informed consent provisions described above in that it stipulates “any access” whereas the systems described above stipulate prior informed consent as requirement for access for commercial use.

The protection afforded by the OAU legislation therefore extends further and includes scientific and research access. Article 5(1) provides that consultation and prior informed consent must be obtained from a National Competent Authority⁹⁴ as well as the concerned community. Article 12 provides for benefit sharing, stating that “the state and the community or communities shall be entitled to a share of the earning derived

⁹³ The OAU is now known as the African Union (AU).

⁹⁴ Article 57 provides for the establishment of the National Competent Authority. Article 58 lists the duties of the NCA.

from when any biological resource and/or knowledge collected generates, directly or indirectly, a product used in the production process”.

This system also suggests the development of a system of registration of items protected by community intellectual rights according to customary practices and law. Article 64 suggests the establishment of databases on the knowledge, resources and technologies of communities with access to the information regulated by “ a charter, setting out the rights of the owners of the data” (Article 64(3)).

(e) Philippines

The Republic of the Philippines has developed a *sui generis* system that is particularly relevant to this study, namely the Traditional and Alternative Medicine Act (TAMA) of 1997⁹⁵. This Act is unique in that it addresses the concerns of traditional communities with regard to one specific aspect of their traditional knowledge (i.e. medicinal knowledge). Section 3(e) lists one of the objectives of the act as “...the protection of indigenous and natural health resources and technology from unwarranted exploitation...” This Act establishes a “Philippine Institute of Traditional and Alternative Health Care” (Section 5), which is attached to the Department Health. This Institute is tasked with conducting research and development activities in the area of traditional medicines, providing training on traditional health practices, acting as a national coordinating centre for the activities of traditional health care stations located across the country and to coordinate with other institutions and agencies involved in research on traditional medicines (Section 6). Administrative powers of the Institute are vested in a Board of Trustees⁹⁶. The Institute is also tasked with promoting traditional health care (Section 12) and to “formulate and implement a research program on the indigenous Philippine traditional health care practices performed by ‘traditional healers’ using scientific research methodologies”.

This Act differs from the systems described above in that it does not refer to issues of access to the resources needed for traditional medicines. This piece of legislation promotes the use and development of traditional medicines and therefore traditional knowledge. Protection in this sense is provided not by securing benefit sharing from

⁹⁵ Republic of Philippines Act no. 8423

⁹⁶ Section 7 requires that the board comprise of the Secretary of Health and permanent representatives from the departments of science and technology, environment and natural resources, agriculture, education, culture and sports, and the Commission on higher education and six industry/sector representatives drawn from a range of industries.

commercial entities using traditional knowledge to develop products but by empowering communities to develop and market their own traditional medicines and resources.

5.2.2 CONTRASTING THE SYSTEMS

The list of systems described above are not exhaustive, as several other countries, regional organisations, international organisations and NGOs have developed similar *sui generis* systems for the protection of traditional knowledge⁹⁷. This protection is often contained within broader systems designed to protect biodiversity and plant varieties. There does exist the recognition that the unique nature of traditional knowledge and associated resources warrants its own unique system of protection.

Irrespective of the system or the approach adopted, countries that are signatories to the CBD have to ensure that such systems are consistent with the provisions and promote the objectives of the convention. The descriptions provided above indicate this, as each of these systems contain provisions relating to:

- a) Prior informed consent, and/or
- b) Benefit sharing provisions.

This is consistent with CBD requirements as contained in articles Article 15(4) and Article 8(j). These requirements also provide the basis for distinguishing *sui generis* protection from intellectual property protection. The fact that a *sui generis* system is specifically designed to address a particular problem makes it obvious that such systems are usually able to provide greater protection for traditional knowledge than would existing IPRs, which may need to be adapted to accommodate the needs of traditional knowledge protection. A *sui generis* system will therefore provide greater protection to traditional knowledge than existing IPRs can, simply because it is designed for this purpose and thus better suited to do so.

Existing IPRs provide for neither prior informed consent nor for benefit sharing agreements, two factors that represent the most important concerns of traditional knowledge holders (as evidenced by the CBD). Accepting these concerns as being paramount, the question that now needs to be considered is whether or not extending the existing IPR system to provide for prior informed consent and benefit sharing

⁹⁷ Philippines, Thailand, Peru, Andean Community, ASEAN, UNESCO etc. are some examples of these different systems developed at different levels.

would then provide adequate protection for traditional knowledge? Alternatively, if the IPR regime were extended in this way, would there still exist a need for the development of *sui generis* systems? Each of these questions will be answered in turn.

Incorporating prior informed consent and benefit sharing provisions within the international IP system (TRIPs) refers to extending the system. This discussion is limited to an extension of the patent system since these provisions are most frequently referred to with reference to patent type protection (WIPO 2003 (b)). Requiring patent applicants to acquire the prior informed consent of traditional communities is intimately related to benefit sharing. Steps taken to acquire prior informed consent would in most instances provide the platform for agreeing on negotiating a benefit sharing agreement in return for access to traditional knowledge and resources (WIPO 2003(b)). Prior informed consent as a patent requirement would therefore serve to ensure that communities are empowered to control access to their knowledge and resources. This protection also allows communities to have the discretion of making such consent subject to the conclusion or negotiation of a benefit sharing agreement. In this way the patent system can provide significant protection for traditional knowledge.

However, extending the patent system in this way only provides for protection against appropriation (defensive protection) and does not provide for protection by ensuring that communities are able to secure rights over their knowledge and resources. *Sui generis* systems are similar in this regard as they provide for the recognition of the rights of communities, thus preventing appropriation from other parties. This would appear to indicate that extending the IP system to accommodate these provisions would be sufficient to negate the need for the development of *sui generis* systems (notwithstanding the aforementioned problems of obtaining patent rights for traditional knowledge). An important point in this regard is that incorporating prior informed consent and benefit sharing into the IP system protects traditional knowledge from appropriation from those parties wishing to patent products based on such knowledge whereas a *sui generis* system extends this protection to any commercial application or any exploitation of the knowledge. The rights of communities over their knowledge are therefore extended and such a system provides for a wider scope of protection, albeit a wider scope of 'defensive' protection.

In addition, a third factor that is vital in distinguishing these systems from the existing IPR regime is the provision for the documenting of traditional knowledge in registries and databases. The significance of this is that the documenting of traditional knowledge

is believed to contribute to the preservation and the protection of traditional knowledge (UNCTAD 2000). This contrasts with prior informed consent and benefit sharing in that it provides a measure of positive protection in the form of preserving knowledge. Registries preserve traditional knowledge, which is especially important as this knowledge is being lost as elder generations pass on (UNCTAD 2000). The storing of knowledge in a registry may not establish a legal claim for traditional knowledge but does provide evidence of the existence of the knowledge. In this way registries can also be used to provide negative protection. The existence of a registry that documents the knowledge is an important aspect of protecting traditional knowledge against appropriation since it would restrict patent applications based on the traditional knowledge as well as providing evidence when patents are challenged (as was done in the Tumeric case⁹⁸). Documented traditional knowledge would constitute a part of the “state of the art” thus challenging any claims of novelty by prospective applicants. In this instance, the registry used in conjunction with the existing IP system protects traditional knowledge from appropriation.

5.3 THE WESTERN CAPE

5.3.1 BACKGROUND

South Africa is the only country on earth to have within its national confines an entire plant kingdom- one of just six in the world. Known as the Cape Floral Kingdom⁹⁹, this area has the highest recorded species diversity for any similar sized temperate or tropical region in the world (DEAT 1997) and, along with the Succulent Karoo,¹⁰⁰ is listed as a biodiversity hotspot¹⁰¹ by Conservation International. The Western Cape thus occupies the unique position of playing host to two of the Earths recognised biodiversity hotspots¹⁰². The extraordinary richness of biodiversity in the region

⁹⁸ The Indian CSIR successfully challenged the Tumeric patent using evidence of its medicinal application found in ancient Sanskrit text and a 1953 paper in the Journal of the Indian Medical Association. Registries documenting traditional knowledge can be used in a similar way to challenge patent applications.

⁹⁹ The Cape Floral Kingdom, also known as Cape Floristic Region, extends across the Southern region of the Western Cape Province and parts of the Eastern Cape

¹⁰⁰ The Succulent Karoo extends from the Southern parts of Namibia across parts of the Northern Cape and into the Western Cape

¹⁰¹ Conservation International identifies ‘hotspots’ as regions that harbour a great diversity of endemic species and, at the same time, have been significantly impacted and altered by human activities. Plant diversity is the biological basis for hotspot designation

¹⁰² Conservation International recognises 25 hotspots on the planet. <http://www.biodiversityhotspots.org/xp/Hotspots/hotspotsScience/>

contributes to a wealth of traditional knowledge related to those resources and makes the Western Cape especially susceptible to the threat of biopiracy.

The South African economy is by no means unique with regard to the dualism that exists within it. Gudeman (1996:104) aptly states, "...all economies are built upon a dualism, but differ in its expression." The existing IP regime falls squarely into the realm of the market economy with its emphasis on creating capital and wealth. IPRs provide the mechanisms to ensure the continuation of innovation thus contributing to capital and wealth creation. However, the market economy does not have a monopoly on innovative activities and community economies are also capable of fostering innovation. Such innovations are usually attributable to group practices rather than the intellectual plans of an individual (Gudeman 1996).

However, the country's history has resulted in a division of society along lines that reach beyond a simple dichotomy of industrialised and agrarian. Historically, racial and ethno-linguistic fractionalisation has also dictated divisions within South African society. This has important implications for traditional knowledge in the region. Wynberg (1998:2) asserts that the country's colonial and apartheid past as well as increased urbanisation has contributed to the fracturing of traditional knowledge resulting in "only pockets" of traditional knowledge existing amongst communities, older people in rural areas and traditional healers. This not only makes it difficult to identify traditional knowledge holders but also poses a significant threat to the protection and preservation of the knowledge that does exist.

5.3.2 LEGISLATION

South African legislation provides no explicit protection for traditional knowledge. Traditional communities seeking protection for their knowledge are therefore required to use existing IPRs and/or other available legal mechanisms (e.g. contracts). These mechanisms are regulated by national legislation as contained in the acts discussed in the previous chapter. As a result, any measures taken to extend these mechanisms so as to better accommodate traditional knowledge, has to be taken at a national level and falls outside the functional areas of the provincial legislatures.

The ability of provincial and local governments to protect traditional knowledge may appear limited given that legal mechanisms to control access to traditional knowledge and to provide protection to traditional knowledge are restricted by constraints on their

areas of functionality. At a provincial level it would appear that the inability to unilaterally amend IP, plant variety protection or biodiversity legislation, which falls outside the scope of provincial capacity, severely curtails the ability of provincial administrations to provide for the protection of traditional knowledge.

However, the Constitution of the Republic of South Africa Act 108 of 1996 does task provincial governments with the objectives of (Section 152(1), (b), (c)&(e):

- Ensuring the provision of services to communities in a sustainable manner;
- Promote social and economic development;
- Encourage the involvement of communities and community organisations in the matters of local government.

In addition the Constitution provides for areas of “concurrent national and provincial legislative competence” (Schedule 4) as well as for areas of “exclusive provincial legislation” (Schedule 5)¹⁰³. Included in the Schedule 4 list are the following areas:

- Administration of indigenous forests;
- Agriculture;
- Consumer protection;
- Education;
- Environment;
- Indigenous and customary law;
- Nature conservation, excluding national parks, national botanical gardens and marine resources.

The Schedule 5 list contains the following:

- Provincial cultural matters;
- Provincial planning.

In addition, the executive authority of the provinces empowers provincial government to implement provincial legislation (on any matter outside of the functions listed in the schedules where that matter is expressly assigned to the provinces by national legislation), implement national legislation (within the functional areas listed in the

¹⁰³ The areas listed only represent areas from the Schedules that do or may have a bearing on the protection of traditional knowledge and as a result do not contain all the areas listed in the relevant Schedules.

schedules), develop and implement provincial policy and coordinate provincial departments and administration.

5.3.3 ROLE OF THE PROVINCIAL GOVERNMENT

This study has focused primarily on IPRs, as a mechanism for protecting traditional knowledge. Limits on provincial governments' ability to amend IP legislation does not necessarily limit its ability to protect traditional knowledge through other mechanisms. The examination of IPRs as a tool for protecting traditional knowledge revealed that for most categories of rights it is not the knowledge per se that is the subject of protection but rather a manifestation of that knowledge in product form or in the form of a mark or geographical indication. Arguing for IPR protection for traditional knowledge often disregards this dichotomy between the knowledge and the products of such knowledge. This dichotomy also extends to the benefits of protection.

Extending IPRs to traditional knowledge may ensure that the economic benefits of traditional knowledge accrue to traditional communities but ignores the social and political implications of such an extension. Dove (1996:62) explaining the use of IPRs to protect traditional knowledge makes the following observation "any introduction of new resources to a local community is potentially hazardous to the welfare of some or all of its residents, no matter how well intentioned their introduction"-the new resources being IPRs for protecting their traditional knowledge. Ensuring communities reap the economic rewards of their traditional knowledge through IP mechanisms without providing the political resources to manage such resources does not serve to adequately protect traditional knowledge holders. Dove (1996:62) concludes that "it is impossible to change a people's economic position-which the proposed use of intellectual property rights tries to do-without also changing their political position-which this proposed use does not address".

The use of IPRs to protect traditional knowledge is a complicated issue. In many instances it is possible to provide some level of protection and where these exist they should be exploited. However as Gudeman (1996) points out larger economic asymmetries connected to financial control and power persist and cannot be dealt with merely by extending IPR protection to traditional knowledge. Providing protection to traditional knowledge holders therefore requires more than just legislative changes. Improving the capacity of communities to benefit from and develop their knowledge

represents an important component of protection. Provincial and local governments thus have an important role to play in the management of traditional knowledge and resources. South Africa's 1997 White Paper on Biodiversity recognises this when it states "...emphasis at provincial level will be on formulating policies and strategies which are locally applicable. ...[furthermore]...the provinces will play a far greater role in undertaking the execution of the policy".

Provincial governments have recourse to promoting policies, not merely as alternatives to the IP system but also to complement the system thereby promoting greater protection for traditional knowledge holders. Arrow and Hettiger provided insight into mechanisms that promote knowledge creation and innovation (government subsidies), extending these to traditional knowledge reveals that provincial governments; although constrained by national legislation, capacity and financial resources, can still provide for protecting traditional knowledge by means other than IPR. The World Bank (2000:2) explains "legal protection of traditional knowledge is a necessary but not sufficient requirement for its preservation and further development". Protecting traditional knowledge is as much about ensuring that benefits accrue to communities as it is about preserving and developing such knowledge for the benefit of the community. Governments can ensure that traditional knowledge as a resource is developed and disseminated in a manner that assists in reducing poverty. In addition to legal protection this can be promoted through (UNCTAD 2000):

- Increasing awareness of traditional knowledge and its preservation;
- Developing traditional knowledge;
- Promoting and exploiting the opportunities for commercialisation of traditional knowledge-based products.

Flexibility within the CBD, the TRIPs and the national legislative framework allows provincial governments the opportunity to address these issues in the following ways¹⁰⁴:

- (a) Provincial government can support studies to assess the impact of IPRs on traditional communities, their biodiversity and the effects of research and development for communities, sustainable development and poverty alleviation. This may include:

¹⁰⁴ Recommendations are drawn mainly from World Bank, UNCTAD and WIPO sources.

- i) Providing clear definitions or descriptions to communities and other stakeholders, about what is meant by traditional knowledge for purposes of protection and benefit sharing;
 - ii) Provide traditional communities with training on IP and the relevance of IP to traditional knowledge protection.
- (b) Encourage and support state funded research with traditional knowledge holders on traditional technologies thereby strengthening the innovative capacity of communities. This can assist communities to develop traditional knowledge in a range of industries contributing to their long run sustainable development and help protect traditional knowledge (UNCTAD 2000). This may incorporate:
 - i) Determining the economic value of traditional knowledge and its actual contribution to the development of a commercial product;
 - ii) Developing provincial registries for traditional knowledge as a defensive mechanism of protection and providing advice and information on the IP implications of such documentation. Registries may also serve to complement a provincial policy on developing geographical indications.
- (c) Developing capacity and institutions
 - i) Provide technical assistance to traditional knowledge holders in the development of commercially viable products;
 - ii) Provide legal assistance to communities, including assistance and training in the negotiation, drafting, implementation and enforcement of contracts;
 - iii) Involving traditional communities in developing model guidelines and provisions for contracts related to traditional knowledge.
- (d) Ensuring participation
 - i) Facilitate dialogue, communication and information flows throughout provincial legislature and other coordinating structures to develop collaboration between traditional knowledge holders, provincial and national departments, the private sector, NGO's and other stakeholders.
- (e) In addition to the recommendations listed above, creating public awareness of potential biopiracy can also be used as an effective tool for protecting traditional knowledge. Media attention informing the public of the contribution

of traditional knowledge to a product could be used to mobilise public pressure against companies commercialising such products without redistributing the benefits to the original traditional knowledge holders. Such pressure could also be used to muster support aimed at ensuring that such communities are compensated for and benefit from the innovations based on their traditional knowledge.

5.4 CONCLUSION

The recognition of the value of traditional knowledge and the need to protect it, coupled with the difficulties associated with applying existing IPRs to the protection of traditional knowledge, has led to the development of a number of unique systems of protection. Such systems are termed *sui generis* systems with broad application in the areas of biodiversity and plant variety protection. The close association of traditional knowledge with these issues often results in traditional knowledge protection being addressed within these broader issues.

Most *sui generis* systems of protection promote the objectives of the CBD and as a result contain provisions dealing with prior informed consent and benefit sharing agreements. These provisions seek to address the threat of appropriation of traditional knowledge. Prior informed consent recognises community's rights over their knowledge and allows communities to control access to and use of such knowledge. In addition, it provides a platform for initiating negotiations on potential benefit sharing agreements.

Extending the international IP system to incorporate provisions relating to prior informed consent and benefit sharing could contribute to significantly increasing the scope of protection they are able to provide to traditional knowledge holders. However, *sui generis* systems, by virtue of the fact that they are specifically designed to address the needs of traditional knowledge holders, are bound to provide greater protection. This is reflected in the promotion of registries often contained in such systems, which provides both defensive and positive protection.

However, both IPRs and *sui generis* systems tend to reside in the international and national legislative frameworks, thus limiting the scope of local and provincial governments to amend or extend protection. In the absence of protection from these systems and functioning within its power, local and provincial government has to

consider other means of addressing the concerns of traditional knowledge holders. Legislative protection alone is not enough, investing in research on traditional knowledge and providing support through information, capacity building and institutions are also necessary if traditional communities are able to pursue goals of sustainable development, which in itself contributes greatly to protecting traditional knowledge. Local and provincial governments have an important role to play in ensuring that traditional knowledge holders are in a position to benefit from their knowledge resources.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The objective of this research was to investigate the problem posited in chapter one. Several important hypothesis and assumptions underpinned and directed the research. These assumptions dictated the methodological approach adopted for this study. The divergent issues associated with the problem necessitated an approach relying on an extensive review of literature from various fields of the social sciences. The approach adopted to investigate the problem was therefore a multidisciplinary one, encompassing economic and legal theory as well as legal philosophy.

This chapter revisits the research problem, the sub-problems and the assumptions presented in chapter one. These are evaluated in light of the analysis conducted in chapters two, three, four and five. The validity of the assumptions determines the recommendations that can be made. Once the assumptions are verified, recommendations on the protection and promotion of traditional knowledge resources in the Western Cape are made. These recommendations are directed at providing the greatest possible protection to traditional knowledge whilst taking cognisance of legal and economic constraints. Recommendations for protection will also be made for the national and international level. In the final section, areas for further research are identified.

6.2 REVISITING THE RESEARCH PROBLEM

Chapter one argued that traditional ethnobotanical knowledge is a valuable resource for the communities that possess such knowledge as well as for the local, provincial and national economy. It was suggested that increasing recognition of the value of traditional knowledge and the rich biodiversity of the Western Cape placed the region at risk of biopiracy. In addition, it was suggested that this threat has to be protected against to ensure that relevant communities and the province extracts the greatest possible benefits from this resource. For this reason the research problem was presented as follows:

To what extent do existing intellectual property rights serve to protect traditional ethnobotanical knowledge in the Western Cape?

The analysis was underpinned and directed by the assumption that existing IPRs serve commercial interests and are therefore unable to provide adequate protection for traditional knowledge. From this problem and this assumption the following sub-problems were identified:

- i. What is the nature and value of traditional knowledge and what are the threats to traditional knowledge?
- ii. What is the origin, and nature of intellectual property rights and how do they apply in the global trading system?
- iii. What is the extent of protection IPRs can offer traditional knowledge holders?
- iv. What are the implications for the Western Cape?

The analysis of the research problem was undertaken in chapters two, three, four and five of this study, with each chapter investigating a relevant sub-problem. Each of the sub-problems was investigated using qualitative analysis. The nature of the sub-problems dictated that sub-problems (i) and (ii) be analysed separately before combining the analysis to address sub-problems (iii) and (iv). Sub problem (iii) provides the test for the hypothesis. The positive or negative conclusion of the hypothesis determines the solution to sub problem (iv), which consists of recommendations made based on the hypothesis. Each of the sub-problems (i), (ii) and (iii) will be discussed and concluded. The hypotheses will then be concluded. Sub problem (iv), the conclusion of which provides recommendations, will then be discussed.

6.3 CONCLUDING THE HYPOTHESIS

The analysis undertaken in chapters two, three, four and five served to address the first three sub problems listed above as well as verifying the initial hypothesis stating that “IPRs serve commercial interests and do not provide adequate protection to traditional knowledge”. The evidence supporting this conclusion is summarized below.

6.3.1 UNDERSTANDING TRADITIONAL KNOWLEDGE

In the first sub-problem it was stated that the increasing recognition of the value of traditional knowledge has resulted in this knowledge being appropriated (biopiracy) for commercial application, often without the approval of and participation of the knowledge holders.

It was found that traditional ethnobotanical knowledge holds value for both commercial entities seeking to develop products based on traditional knowledge as well as for the communities that possess such knowledge. Traditional knowledge is particularly valuable in the pharmaceutical industries where knowledge of bioresources provides valuable leads to bioprospectors regarding the nature and application of such resources as potential medicinal products. Protecting traditional knowledge is necessary to ensure that communities that contribute their knowledge are recognised and compensated for such contributions.

The value of traditional knowledge therefore extends beyond its value to pharmaceutical and research companies and provides a potentially valuable and important economic resource for the traditional communities themselves. Realising these potential economic benefits can contribute significantly to the empowerment and sustainable development of these communities. For communities to realise the benefits of this potential resource, traditional knowledge needs to be adequately protected and promoted.

6.3.2 UNDERSTANDING INTELLECTUAL PROPERTY

The second sub problem follows from the insight reached in investigating the first sub problem. For a system to provide adequate protection to traditional knowledge it has to be consistent with and suited to the needs of traditional knowledge holders.

Having identified several general needs of traditional knowledge holders as well as several general characteristics regarding the management of traditional knowledge, this chapter investigated the features and rationale that motivates the existence of IPRs in order to assess whether these tools of protection are suited to protecting traditional knowledge. In so doing this chapter served to investigate an aspect of the initial hypothesis, 'IPRs were designed to serve commercial interests'. An analysis of the literature and available theories revealed that extending existing property rights theories into the field of intellectual property was a difficult task given the abstract nature of

intellectual goods. However, the relative lack of IP theories makes such an extension necessary and does provide valuable insights into the nature of and justification for the existence of IPRs.

The analysis revealed that the dominant justification for IPRs was based on utilitarian considerations that promote IPRs as a necessary incentive for innovative activity. This approach is linked to the natural rights approach that posits the moral argument of “each being entitled to the fruit of their labour” but differs from this moral argument by suggesting IPRs are necessary for the efficient functioning of markets in knowledge. The utilitarian justification thus provides the basis for an economic rationale of the existence of IPRs. IPRs protect investment in innovative activity by conferring exclusive rights to the innovator thereby ensuring that such innovators are able to recover their research costs and realise profits from their invention (this encourages further innovation). The existing IPR system underpinned by these considerations rests on the principles of individualism and private property that dominate the global trading environment. The WTO reinforces and promotes this approach to IP in the TRIPs agreement by recognising IP as being ‘trade related’.

The obligations imposed on member countries by the TRIPs agreement often ignores the IP and development needs of member’s economies and promotes a system best suited to developed nations and multinational corporations. A uniform system of rights promoted by and serving the interests of developed nations can be viewed from the power paradigm as reflecting that those best served by the system will seek to maintain and expand the system in an effort to maintain and extend their power. The inclusion of IP as a trade issue within the WTO framework reflects the value of IPRs as a trade instrument and reinforces the idea that these mechanisms are designed to serve vested interests, these interests being the interests of parties that benefit the most from a uniform system of IPRs. The inclusion of IPRs as a ‘trade related’ issue in the multilateral framework of the WTO reflects the interests of multinational corporations and developed nations who rely extensively on these mechanisms to maintain their power and wealth in an increasingly knowledge driven global economy.

In addition, the exclusion of traditional knowledge within the TRIPs, coupled with the desire to extend patents to cover life forms, is also indicative of this bias inherent in the system and contributes to the conclusion that the existing IPR systems are indeed designed to serve vested interests (i.e. interests of commercial entities).

6.3.3 PROTECTING TRADITIONAL KNOWLEDGE

It was hypothesised that because IPRs serve commercial interests they are not able to provide adequate protection for traditional knowledge. Adequate protection in this sense refers to protection that meets the needs of traditional knowledge holders, with protection against appropriation (biopiracy) identified as the most important measure for protection. Analysing traditional knowledge and the IPR system revealed the different nature of these two institutions. The sub problem investigated is whether existing IPRs are able to protect traditional knowledge and how they can be used. To determine if IPR protection is adequate, several alternative (*sui generis*) systems of protection were also analysed and the protection they provided against appropriation was contrasted with the protection offered by existing IPRs.

Chapter three provided the conclusion that IPRs serve commercial interests, whilst this problem addressed here was whether IPRs are able to provide for the protection of traditional knowledge.

This was achieved by applying legislation to the traditional knowledge of a medicinal plant indigenous to Southern Africa. It was found that patent protection, which could potentially provide greatest protection for traditional knowledge (given that patents serve as the primary mechanism for protecting knowledge in general) is not suited to the needs of traditional knowledge holders. Problems of identifying owners, determining inventors and novelty, time limited rights and costs all limit the potential for this tool to be used to protect traditional knowledge. Similar and other constraints limit the potential for other categories of rights to protect traditional knowledge. The most important discrepancy between traditional knowledge and IPRs was identified as the different conceptions of property (private v communal/public) that exist between the two systems. This reflects the different nature of the systems and also the different interests they serve. It was also found that although IPRs do not provide protection in the form of securing rights over knowledge, the existing system does provide for a measure of defensive protection. However, traditional knowledge holders are often unaware of this potential. This 'defensive' protection against appropriation can only be used when those seeking to appropriate the traditional knowledge use IP mechanisms as a way of securing rights over products based on traditional knowledge. If no recourse is made to securing IPRs no defensive protection is available to traditional knowledge holders.

Alternative systems of protection were then analysed. This analysis revealed that aside from being specifically designed for protecting traditional knowledge (thereby providing greater protection), *sui generis* systems of protection are similar to IPRs in that they provide for defensive protection through legal mechanisms. However, they differ from IPRs by providing protection in any instance of commercial application of such knowledge by requiring prior informed consent and benefit sharing. In addition, *sui generis* systems promote the documenting of traditional knowledge in databases and registries. Within the IPR regime, documenting knowledge could entitle communities to copyright protection but would result in communities not being able to secure patent rights over their traditional knowledge. However, in a *sui generis* system such documentation is generally intended to serve as evidence of ownership rights, rather than limiting ownership claims. They serve as evidence of such claims. In addition, documenting traditional knowledge limits the possibility of other parties securing IPRs over traditional knowledge (defensive protection).

It was also found that amending the IPR system and in particular patentability requirements could significantly increase the potential for patents to be used to protect traditional knowledge. Requiring applicants to obtain prior informed consent and negotiate benefit-sharing agreements would contribute significantly to the protection of traditional knowledge. Such an extension of the patent system would also serve to recognise the rights communities enjoy with regard to their traditional knowledge and ensure that communities benefit from the exploitation of their knowledge and resources.

It was therefore concluded that the IPR system as it exists, both in the international trade environment as well as at a national level, fails to adequately address the threat of biopiracy (appropriation) and therefore fails to adequately address the concerns of traditional knowledge holders, thus positively concluding the initial hypothesis.

6.4 RECOMMENDATIONS

In concluding the hypothesis it was shown that the close association of traditional knowledge with culture, belief and community practice means that any system of protection needs to take cognisance of the unique practices of communities as regards the management of their traditional knowledge. However, the diaspora of communities and practices both globally and within South Africa makes this a difficult task.

Identifying general characteristics of traditional knowledge therefore proves valuable in developing a system of protection suited to the needs of traditional knowledge holders. In addition, any system of protection has to also take cognisance of conventions and agreements entered into by a nation given that these may impose constraints or obligations on the nation's ability to provide such protection. In this regard the CBD and the TRIPs proved most relevant for discussions on traditional knowledge.

It was also found that both IPRs and *sui generis* systems function at the multilateral, regional and national levels, thus limiting the potential of provincial governments to autonomously develop legal mechanisms for protection. It was suggested that the wealth of biodiversity in the Western Cape and the constraints on functionality in terms of developing legislation to protect traditional knowledge makes provincial protection for traditional knowledge a difficult task.

Accepting that IPRs constitute one means of providing protection leads to the suggestion that protection need not be limited to legal protection, then, functioning within its area of power, provincial government has an important role to play in protecting traditional knowledge through mechanisms other than legislation. The most important contributions provincial government can make to protect traditional knowledge are in the areas of support and capacity building. Several of these recommendations have been proposed in chapter five and will not be repeated here.

Finally, it should be noted that some minimum level of legal protection is necessary if provincial support to traditional knowledge holders is to be effective. In this regard provincial government can contribute to lobbying for legislative reform. Developing laws with the participation of all relevant role players is especially important in this regard and needs to be considered. In the absence of such protection the best prospect for securing benefits from the exploitation of traditional knowledge remains contracting between parties. Provincial governments also have an important role to play in ensuring that traditional knowledge holders are educated and assisted in negotiating and concluding such agreements.

6.5 AREAS FOR FURTHER RESEARCH

The complexity of the issue under investigation makes it especially difficult to address all the possible issues that arise without exceeding the bounds of this research study.

This study is no exception. However, this research has provided insight into several topics informed consents that warrant additional research.

This study has introduced the threat of appropriation of ethnobotanical knowledge and the challenges facing traditional knowledge holders who seek recognition and compensation for the exploitation of their traditional knowledge. IPRs as they exist have proved inadequate for the protection of traditional knowledge. Directly linked to this study would be further research on extending the patent system to accommodate traditional knowledge.

The value of trademarks and GI as a marketing tool for traditional knowledge was highlighted. Establishing marks as a mechanism for protecting traditional knowledge requires traditional knowledge holders to have the capacity to develop commercially viable products based on their knowledge. Establishing marks based on traditional knowledge also promotes the culture that contributed the knowledge. The implications for traditional knowledge of potential GI legislation in South Africa needs to be investigated. This could include the possibility of linking traditional knowledge registries into a broader GI registry. This area provides for research on links between trademarks/GI and sustainable development.

These areas of research can both be linked to the broader subject field of biodiversity. This area provides fertile ground for studies on the impact of IPRs on agricultural biodiversity and their effects on poverty alleviation.

Finally, the concept of *sui generis* systems of protection and developing model laws for the protection of traditional knowledge also provides an opportunity for further research into the development of registries for the documenting of traditional knowledge. The potential for the development of provincial, national and international registries also needs to be considered, as does the legal and economic implications of their existence.

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