THE CONTRIBUTION OF THE TRADE IN *PELARGONIUM SIDOIDES* TO RURAL LIVELIHOODS IN SOUTH AFRICA AND LESOTHO

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ABSTRACT

Benefits arising from trade in medicinal plant species have historically been skewed in favour of technologically advanced user countries. Producer countries in the developing world have not however seen tangible evidence of the value of their natural resources, in spite of promises made by the widely adopted international treaty, the Convention on Biological Diversity (CBD). In response to their commitment to the objectives of the CBD, the governments of South Africa and Lesotho have implemented new regulatory approaches which aim to control access to natural resources and ensure benefits from their use through access and benefit-sharing arrangements. These approaches have been applied to the trade in roots of *Pelargonium sidoides* – a medicinal plant around which a substantial industry has developed. The plant is endemic to southern Africa and widely distributed in the Eastern Cape Province of South Africa and Lesotho. It has become a popular natural remedy worldwide, with extracts marketed successfully in Europe and America for the treatment of bronchitis and other respiratory ailments. The trade in this species in Germany was worth an estimated 80 Million Euros in 2008.

Rural communities in southern Africa are directly involved in harvesting *P. sidoides* for commercial trade and also hold traditional knowledge about the plant. Yet concerns have been expressed - both about unsustainable harvesting of the resource and the limited benefits accruing to harvesters. Moreover, several patents protect extraction methods and preparations made from this species, raising questions around the issue of ownership of traditional knowledge.

This research seeks to identify the contribution of the *P. sidoides* trade to the livelihoods of harvesters from the Eastern Cape Province and Lesotho. By examining this contribution to rural livelihoods in light of unequal distributions of income and wealth; it is hoped that the factors which prevent collectors of wild resources from southern provider countries from benefiting more fairly from resource exchanges are identified. Further objectives of this study are to investigate the impacts of commercial cultivation of this species and assess the current level of social accountability presented by the *P. sidoides* industry.

The objectives of this research were met through the use of methods such as desktop studies, focus groups and semi-structured interviews with key stakeholders in the *P. sidoides* industry.

The thesis concludes that the *P. sidoides* industry demonstrates common traits of the international trade in medicinal plants such as limited benefits to southern producer countries and an uneven playing field on which negotiations take place. Moreover, it shows that the well-intentioned interventions from governments in the form of benefit-sharing agreements resulting from their adoption of the objectives of the CBD do little to enhance the prospects of the most marginalised and vulnerable members of impoverished rural communities.

LIST OF ACRONYMS AND ABBREVIATIONS

ABS	Access and Benefit Sharing
ACB	African Centre for Biosafety
ADM	Amathole District Municipality
AU	African Union
BfN	German Federal Agency for Nature Conservation
BSA	Benefit-Sharing Agreement
CBD	Convention on Biological Diversity
DEAET	Department of Economic Affairs, Environment and Tourism, Eastern Cape Province, South Africa
DEAT	National Department of Environmental Affairs and Tourism, South Africa (former)
DEDEA	Department of Economic Development and Environmental Affairs, Eastern Cape Province, South Africa
DNA	Deoxyribonucleic Acid
EED	Church Development Service – Protestant Churches of Germany
EIA	Environmental Impact Assessment
EPO	European Patent Office
GDP	Gross Domestic Product
GMP	Good Manufacturing Standards
ILO	International Labour Organisation
IMO	The Institute for Marketecology
ISSC-MAP	International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants
IUCN	The World Conservation Union
LMMC	Group of Like-Minded Mega-diverse Countries
MAP	Medicinal and Aromatic Plant
MAT	Mutually Agreed Terms
NEMA	National Environmental Management Act of South Africa
NEMBA	National Environmental Management: Biodiversity Act of South Africa
NES	National Environmental Secretariat, Lesotho

NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Product
PIC	Prior Informed Consent
RNA	Ribonucleic Acid
SANBI	The South African National Biodiversity Institute
SIPPO	The Swiss Import Promotion Programme
TESA	TRAFFIC East/Southern Africa
TRAFFIC	The Wildlife Trade Monitoring Network
TRIPS	Trade-Related Intellectual Property Rights Agreement
UEBT	Union for Ethical BioTrade
UNCTAD	The United Nations Conference on Trade and Development
WHO	The World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
WWF	World Wide Fund for Nature

Bophelo	Bophelo Natural Products, Mohale's Hoek, Lesotho
Schwabe	Dr Willmar Schwabe GmbH & Co
The Bonn Guidelines	The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization
The Trust	The Imingcangathelo Community Development Trust

TERMINOLOGY AND DEFINITIONS USED

The following terms are commonly used in the discourse around access and benefit sharing of natural resources and when describing resources destined for the botanical medicine industry.

The total number of living things, their genetic material, diversity of species and interactions within ecosystems constitutes **biological diversity** or simply **biodiversity** (UNEP, 1994). Within this complex arrangement other groupings are isolated according to different definitions. One such group is **Non-Timber Forest Products (NTFPs)** which refers to products from the wild commonly used by rural people such as wood for fuel, wild foods like spinaches, household utensils made of wood, weaving materials and medicinal plants (Shackleton and Shackleton, 2004).

In the realm of the trade in natural resources and the search for new compounds to include in products, the expressions **biodiversity prospecting** or **bioprospecting** are frequently used. **Bioprospecting** was first defined by Reid *et al* (1993 cited in Laird and ten Kate, 2002) as the exploration of biodiversity for commercially valuable genetic and biochemical resources. According to ten Kate and Laird (1999) this term includes a wide range of commercial activities spanning the pharmaceutical, biotechnology, seed, crop protection, horticulture, botanical medicine, cosmetic and personal care as well as food and beverage sectors. However, not all activities related to biological resources are classified as bioprospecting; examples of these actions are academic or conservation research and the commercial use of natural resources such as trading large volumes of raw materials (Laird and Wynberg, 2003).

Another activity which may be labelled as **bioprospecting** is the gathering of traditional knowledge regarding natural resources from local communities (Laird and Wynberg, 2003). However, when this knowledge is appropriated without the consent of the knowledge holders or fair compensation being offered to the knowledge holders, the activity is labelled as '**biopiracy**' (Tedlock, 2006). This term may also be employed

when patents and other intellectual property rights are used to establish control over genetic resources (Karasov, 2001).

The distinction should be made between **natural resources**, **genetic resources** and **biological resources**. Firstly, a **natural resource represents** any property of the physical environment, such as minerals, or natural vegetation, which humans can use to satisfy their needs (Geographical Dictionary, n.d.). The definitions for genetic resources and genetic material are taken from the text of the Convention on Biological Diversity (UNEP, 1994). A **genetic resource** is genetic material of actual or potential value (CBD, Article 2). **Genetic material** could be any material of plant, animal, microbial or other origin containing functional units of heredity (CBD, Article 2). These 'functional units' are commonly known as DNA (deoxyribonucleic acid) or in some instances RNA (ribonucleic acid). Therefore, **genetic material** as defined by the CBD could be a seed, cuttings from a plant, a whole organism or DNA extracted from a plant, animal or microbe. Finally, **biological resource** refers to a broader category which includes **genetic resources**, but also organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity (UNEP, 1994).

When genetic resources are traded between countries, the term '**provider**' refers to the country allowing access to the material whereas the other party to the arrangement is commonly known as the '**user**' country. **User** countries are most often the technologically advanced countries of the global '**north**' while **provider** countries which are rich in biodiversity are most likely situated in the global '**south**'.

In the medical world, the distinction should be made between the **botanical medicine industry** which produces 'medicine of plant origin, in crude or processed form; used to represent herbal, or plant-based medicines that are not consumed as isolated compounds' (Laird, 2002, 455) and the much larger **pharmaceutical industry**. Although many **pharmaceuticals** may originally be based on plant material, the distinction lies in the **pharmaceutical industry's** focus on isolating active compounds.

Botanical medicines, which are derived from whole plant material, contain large numbers of active compounds which work together in a complex manner. The prefix 'phyto-' is derived form the Greek *phuton* meaning 'a plant', thus the common term **phytomedicine** refers to plant-based remedies and is more clearly defined in the following table which describes various forms of botanical medicines.

Table 1: Forms of botanical medicines	
Raw Plant Material	Fresh or dried
Extracts	Active material separated with solvent
Standardized Extracts	Standardized to one or more chemical markers
Phytomedicines	Standardized to a few groups of active marker compounds, sometimes other original compounds are eliminated

Adapted from: Laird and ten Kate, 2002

CHAPTER 1: INTRODUCTION

1.1. Background

Benefits arising from the trade in medicinal plant species have historically been skewed in favour of technologically advanced 'northern' user countries (Laird and Wynberg, 2003). Despite progress towards more equitable sharing of benefits arising from the commercialisation of natural resources in recent times, 'southern' producer countries rich in biodiversity still have to vie for their rightful portion of such benefits.

A leading international treaty which promotes conservation and human well-being is the United Nations Convention on Biological Diversity (CBD). Since its inception in 1993, the CBD has provided member states with a framework which enables fair benefit sharing around the sustainable use of genetic resources (CBD, 2002). However, despite the promises presented by this widely adopted treaty, countries providing genetic resources have seen little tangible evidence of the value of these resources (Karasov, 2001). This is illustrated by an example from southern Africa, where a substantial industry has developed around the use of the roots from *Pelargonium sidoides* DC. (Geraniaceae) - a plant endemic to the region.

P. sidoides is widely used as a traditional remedy in the regions where it naturally occurs. It is found throughout the eastern parts of South Africa as well as in Lesotho (*Newton et al,* In prep.). Therefore, the traditional knowledge associated with this plant and its uses is widely spread across cultural groups and geographical areas (Watt and Breyer-Brandwijk, 1962; Hutchings *et al*, 1996; Brendler and van Wyk, 2008; van Wyk and Brendler, 2008). Although the indigenous knowledge about this plant has not yet been thoroughly recorded (van Wyk, 2008), it is recognised that this knowledge has been in existence for a long time (Brendler and van Wyk, 2008).

Besides its local use and trade within the informal and formal medicinal markets, *P. sidoides* is used in a popular natural cold-care remedy internationally. Extracts from *P. sidoides* are marketed by a prominent German pharmaceutical company, the Dr. Willmar Schwabe Group, under the name 'Umckaloabo.' The clinically proven efficacy of this product and high rates of customer satisfaction led to sales worth 80 Million

Euro (around 908 Million Rand) at the till point in 2008 (Waimer, Schwabe, pers. comm., 2009). Dr. Willmar Schwabe GmbH (hereafter 'Schwabe') – the company responsible for plant-based medicines within the Dr. Willmar Schwabe Group, is also involved in patenting extraction methods and preparations made from this species (ACB, 2008b). Some of these patents have been challenged by a non-governmental organisation (NGO) based in South Africa, the African Centre for Biosafety (ACB) as well as representatives of a community previously involved in harvesting in the Eastern Cape (ACB, 2008a). The ACB are supported by a Swiss NGO, the Berne Declaration, and two German organisations - the Church Development Service (EED) and "*Kein Patent auf Leben*" (EED, 2008). Their campaign is aimed at raising awareness, particularly in Germany, around the contentious issue of the patenting of genetic resources and associated traditional knowledge (EED, 2008; ACB, 2008b).

Schwabe procures its raw *P. sidoides* material from southern Africa through a local company called Parceval. This company does not negotiate with harvesters directly, but rather trades via 'middle-men' or intermediary buyers who are more familiar with the areas in which harvesting takes place (Paulsen, BZH, pers. comm., 2009). The growing popularity of Umckaloabo and similar products prepared from *P. sidoides* extracts has led to increased collection of the plant in the wild, particularly since 2001 when wild collection intensified in the Eastern Cape Province of South Africa (Newton, In prep.). In fact, harvesting of wild populations escalated to such an extent that the Eastern Cape Provincial Department of Economic Development and Environmental Affairs (DEDEA) implemented a temporary ban on harvesting in 2007, fearing that the resource may be over-exploited (Bam, DEDEA, pers. comm., 2009). The implementation of the ban may have been well-intentioned, but unfortunately it can be linked to negative impacts such as increased illegal harvesting and the negative ecological effects thereof (Hahndiek, Eastern Cape Nature Conservation, pers. comm., 2009). Another consequence of the ban was the relocation of wild harvesting to Lesotho as the intermediary buyers sought new sources of raw material to meet the demand (Nieuwoudt, Bophelo, pers. comm., 2009).

Apart from reservations about the sustainability of the resource (Bam, DEDEA, pers. comm., 2009), concern has been expressed about the low payments received by harvesters in light of the success of the international trade in this species (ACB, 2008a). The rural areas of South Africa and Lesotho where wild harvesting primarily

takes place are characterised by extreme poverty, reliance on social welfare grants and limited economic opportunities (Stats SA, 2009). Therefore many harvesters willingly engage in the trade in order to supplement their livelihoods, but the financial benefits gained in this manner can be seen as limited and unreliable. One way of creating a more stable source of income is by establishing commercial cultivation facilities. Successful commercial plantations guarantee a sustainable source of income to those involved whilst relieving pressure on wild stocks (Schippmann *et al*, 2002). However, cultivation poses a number of risks, including favouring the 'social elite' rather than relieving poverty (Homer-Dixon *et al*, 1993).

Beyond cultivation, the question remains how rural communities stand to benefit more widely from the trade in *P. sidoides* through allowing members of the industry access to their communally held land, resources and knowledge. The governments of South Africa and Lesotho may also enquire how greater benefits on a national level - apart from collecting taxes - could be derived from the sustainable use of this resource. Yet another issue which this industry raises is the widely held traditional knowledge of this plant and the appropriation of this knowledge by multinational companies.

1.2. Aim and Objectives of the Dissertation

The botanical medicine industry has long been characterised by profits being realised in northern user nations, whilst southern provider countries and more specifically the rural communities which collect the raw materials for botanical medicines, have derived little benefit from this trade (Laird and Wynberg, 2003). Direct benefits in the form of limited financial gains have typically not been enough to make a sustainable difference to rural livelihoods, thus failing to raise such communities out of poverty.

Unless more equitable ways can be identified by which to distribute these benefits, rural communities are doomed to remain poor and disenfranchised through their lack of access to markets and technology, organisation, power, knowledge and financial capital in negotiations with companies and nations in possession of all these attributes (Ribot and Peluso, 2003; Kepe, 2008; Scoones, 2009).

The principal aim of this research is to understand the benefit flows from the international trade in *P. sidoides* and identify factors affecting benefit sharing within the industry.

In order to achieve this aim, a number of objectives have been identified. The first objective of this research seeks to identify the benefits which arise along the lifecycle of *P. sidoides* from its origins as a natural resource native to southern Africa until it is sold as a technically advanced product on the international botanical medicinal market. These benefits may be monetary or non-monetary in nature and could potentially transpire along any stage of the lifecycle of the product - from the initial extraction period up to the final consumption phase. Through employing access theory, the patterns of benefit distribution are established and subsequently the factors which determine particular benefit distribution patterns are investigated.

The second objective of this study aims to estimate the contribution commercial cultivation of this species makes to rural livelihoods, along with examining the role of cultivation projects in long-term partnerships between industry and communities.

A final objective of this research is to appraise the current level of social responsibility of the *P. sidoides* industry. This is achieved by assessing the industry by means of a set of international standards – the FairWild Standards (FairWild Standards, 2006). The FairWild Standards were developed for industries based on the collection of wild resources which endeavour to enhance their progress towards sustainability by increasing aspects of social performance and including the principles of Fair Trade within their operations.

1.3. Significance of the Study

As described, trade in medicinal plant species has developed along unequal lines of benefit distribution. In general, those countries rich in biodiversity which supply the genetic material have not been compensated fairly for their knowledge and natural resources. Attempts are being made by the governments of South Africa and Lesotho to address these disparities within their own biodiversity-rich nations. One of the interventions is the requirement by both governments for industry members to

conclude benefit-sharing agreements with communities supplying them with plant material. The *Pelargonium* industry has been caught up in these advances and the examination thereof may cast light on the practical applicability and impact on communities of the agreements being concluded.

Very little previous research has been conducted on the *P. sidoides* industry in South Africa and Lesotho. This study attempts to estimate the extent to which communities in the Eastern Cape and Lesotho benefit from the harvest, trade and use of *P. sidoides*, and thereby contribute to the knowledge surrounding this industry. Further, this thesis intends to address some of the concerns which have been expressed about this resource – namely its sustainability, the low prices paid to harvesters and the lack of recognition for traditional knowledge held by users of the plant.

The commercialisation of *P. sidoides* has some aspects in common with other medicinal plants from the southern African region which have also been introduced to the formal medicinal market, such as devil's claw and *Hoodia* spp. However, the introduction of benefit-sharing agreements at the time of the research adds a new dimension and set of expectations to the progression of the commercialisation of this species. Impoverished rural communities stand to gain from the trade in *P. sidoides*, not only financially, but through increased social upliftment through training, technology transfer and capacity building, but only if such avenues can be identified.

1.4. Research Methodology

The methods employed in this research consisted of stakeholder mapping; literature review; attending key meetings and workshops; field work which entailed conducting interviews and focus groups; semi-structured interviews with key informants; as well as an assessment of the industry according to a set of international standards.

Stakeholder Mapping

Research commenced in January 2009 with stakeholder mapping. The main groups identified were: (1) harvesters from communities in the Eastern Cape Province of South Africa and Lesotho; (2) members of industry – consisting of direct buyers, processors, intermediary buyers, exporters and the international company

responsible for marketing *P. sidoides* products; (3) a further group identified consisted of national and provincial government representatives from South Africa and officials from the National Environmental Secretariat in Lesotho and finally, (4) the NGOs which have been involved in this industry.

Literature Review

A preliminary desktop study reviewed the literature around the use and commercialisation of *P. sidoides.* The literature review was expanded to include both published and unpublished documents surrounding the commercialisation of medicinal plants; benefit-sharing agreements; cultivation of medicinal plants; legislation pertaining to bioprospecting, access and benefit sharing; social justice; traditional knowledge and intellectual property rights; access theory and the sustainable wild harvesting of medicinal plants. Internet searches revealed trade figures and other statistics related to the plant pharmaceutical industry and specifically information about the companies involved in the *P. sidoides* trade.

Workshop Attendance

Two *P. sidoides* Stakeholder Consultation Workshops were attended. These workshops were jointly hosted by The Wildlife Trade Monitoring Network (TRAFFIC) East/Southern Africa (TESA) and the South African National Biodiversity Institute (SANBI). The goal of the workshops was to introduce the Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) to those involved in the *P. sidoides* trade in South Africa and Lesotho. The ISSC-MAP aims to guide the development and implementation of integrated resource management plans for medicinal plants and will be used to develop a Biodiversity Management Plan for *P. sidoides* in the two southern African countries where it naturally occurs (ISSC-MAP, 2007). The workshop highlighted the issues surrounding the trade in *P. sidoides* and provided an opportunity to meet with key stakeholders in the industry, representatives of the national and provincial governments, as well as members of local communities involved in harvesting and cultivating the plant. The first workshop was held on February 3rd 2009 in Grahamstown in the Eastern Cape Province. The second workshop was held in Maseru, Lesotho on March 17th 2009.

Fieldwork: Interviews and Focus Groups

The Grahamstown workshop was followed by a five-day field trip arranged by TRAFFIC and SANBI to communities in the surrounding area. The aim of the field trip was for scientists from TRAFFIC and SANBI to identify sites of previously harvested *P. sidoides* for a study which will attempt to ascertain the rate of tuber regrowth. The sites were identified by an intermediary buyer and a local botanist. Accompanying these scientists presented the opportunity to become familiar with the environment where *P. sidoides* grows and is harvested. The fieldtrip also presented the chance to interact with community members previously involved in harvesting. This entailed conducting preliminary interviews with harvesters with the help of an interpreter. A pilot questionnaire was compiled which tested a set of questions aimed at gauging levels of livelihood dependence on the resource and identifying problems related to wild harvesting.

The questions from the pilot questionnaire were refined and expanded upon for the subsequent focus groups held with harvesters. The main reason for employing focus group methodology rather than household surveys or one-to-one interviews, was the limited budget and time available for field work. However, this method of data collection was successfully employed and presented a number of benefits. According to Gray (2004), focus groups hold the advantage of allowing a range of views to be heard whilst being a cost-effective method for data collection. Other advantages of focus groups are non-discrimination against illiterate participants and enhanced participation from those who may be intimidated by a formal one-to-one interview (Kitzinger, 1995).

A generic set of questions (See **Appendix 2**) was prepared for harvesters both in South Africa and Lesotho so that comparisons could be drawn from the experiences of harvesters in the two countries. In each of the countries interpreters who were familiar with the local dialect were used and refreshments were supplied. The duration of the focus group sessions ranged between one and two hours. Notes were taken and recordings made which were later transcribed. The focus group sessions also provided the opportunity to observe harvesting techniques, cultivation projects in action and evidence of harvesting.

The ISSC-MAP workshop held in Maseru was followed by a visit to a processing facility at Mohale's Hoek and two field sites. These sites - the villages of Ha-Thlaku and Tsatsane, located in the Quthing district in the south western part of the country (See **Figure 2,** p14), were chosen by the researchers from TRAFFIC from a number of harvester communities which were identified by the Environmental Officer based in Quthing. The sites thus selected by the members of TRAFFIC were representative of areas where *P. sidoides* was harvested and also gave an indication of the variation in altitude found in Quthing District. Of course, when arranging a focus group logistical problems may arise (Gray, 2004), however in this case an adequate number of harvesters gathered in each of the villages, respectively nine in Ha-Thlaku and 25 in Tsatsane. The questions aimed at the harvesters served to identify the direct benefits accruing to community members from harvesting; their attitudes towards cultivation; the impacts of national policies as well as problems and future hopes related to the industry.

A return trip was made to the Eastern Cape in April 2009. Again, two focus groups were arranged with communities which had been involved in harvesting prior to the ban. The selection of these groups was based on contacts made at the workshop held in Grahamstown in February and it was decided to select two communities with divergent experiences of the *P. sidoides* trade. Unlike the two communities in Lesotho which had similar experiences of the *P. sidoides* trade, the two communities selected in the vicinity of Alice (See **Figure 1,** p12) in the Eastern Cape had different involvements with the industry – even though they belong to the same traditional authority, the Imingcangathelo Clan. Harvesters gathered at Nkcwankcewa village were involved in the Imingcangathelo Community Development Trust which had established a partnership with industry members and was thereby involved in a benefit-sharing agreement and a cultivation project. The focus group conducted here consisted of 12 members. The other focus group, held at Lokwe village consisted of a small number of elderly women. This village has been involved in the patent challenges launched by the ACB since 2008. Additional sets of questions were crafted to try and gauge the perceptions of these two sets of harvesters towards the industry. It was hoped that these views would contribute to a deeper understanding and broader insight into the *P. sidoides* industry.

Key Informant Interviews

Since the data collected for this research would mostly be qualitative, semi-structured interviews were employed (Gray, 2004) when speaking to key informants. This approach proved to be useful for gauging the attitudes of respondents towards various aspects of the *P. sidoides* trade. Members of industry (See **Appendix 3**) and provincial government officials (See **Appendix 4**) were interviewed on a one-to-one basis; whenever possible face-to-face, otherwise telephonically. All interviews with were conducted in English and notes were taken. Interviews conducted in person were recorded and transcribed. Most interviews lasted between one and two hours. An interview with the ultimate buyer of the raw material – Schwabe – explored the company's viewpoint of the trade and new arrangements. Finally, representatives of the national governments (See **Appendix 4**) of South Africa and Lesotho were questioned about their perspectives on the trade, their interpretation of new legislative measures and future plans for the resource.

During the time spent in the Eastern Cape, semi-structured interviews were held with a local buyer to determine the extent of the industry prior to the ban as well as to assess the effect of the ban. Furthermore, the regional manager of the Department of Nature Conservation in the Eastern Cape was interviewed in order to gauge levels of concern for the resource and interpretation of the new legislation. Finally, the Deputy Director of Biodiversity Conservation Management was asked about the provincial government's perspective on the industry and the applicability of the new bioprospecting regulations. The time spent in Grahamstown was also used to obtain primary sources of information relating to *P. sidoides* and its trade, such as historical harvester records.

Data Analysis

Since focus group data centres on language, the examination of the data relied on identifying underlying themes rather than numerical analysis (Grudens-Schuck *et al*, 2004). The data gathered was closely studied and recurring phenomena were named and categorised through the process of 'open coding.' The next step in the data analysis involved recognising the relationships between categories – a process called 'axial coding.' Finally, through applying 'selective coding' the core categories were chosen through which the 'story' of the *Pelargonium* industry could be told (Gray, 2004).

Assessment

A final method which was applied in order to gauge the overall impact of the *P. sidoides* trade on communities from South Africa and Lesotho was to estimate the industry's performance according to a set of international standards – the FairWild Standards (FairWild Standards, 2006). The FairWild Standards incorporate aspects of the ISSC-MAP which was developed in partnership with the German Federal Agency for Nature Conservation (BfN), The Wildlife Trade Monitoring Network (TRAFFIC), The World Wide Fund for Nature (WWF) and The International Union for Conservation of Nature (IUCN). The FairWild Standards also integrate the principles of fair trade which was initiated by The Swiss Import Promotion Programme (SIPPO) in cooperation with Forum Essenzia and The Institute for Marketecology (IMO). The principal aim of the FairWild Standards is to ensure the sound implementation of the ecological and social aspects of the trade in wild collected species (FairWild, 2009). The FairWild Standards were not applied rigorously during this research since not all the relevant material was available, but rather as a framework by which to analyse the *P. sidoides* industry's level of social responsibility.

Ethics

During the course of this research every effort was made to conform to acceptable standards of ethics. The right of participants to refuse involvement was respected and confidentiality was ensured. Photographs or recordings of conversations were always preceded by asking the subject's permission. In the case of photographs of people, their names and postal addresses were collected so that copies could be sent to them. When arranging the focus groups in Lesotho local protocol was followed, in other words permission was obtained from the district council and local chiefs before the villagers were interviewed. In the Eastern Cape the chieftainess of the Imingcangathelo Clan was approached for permission to speak to the harvesters. At each focus group the nature of the study and the reason for the meeting was explained with the help of local interpreters. It was also made clear that participation was voluntary and further, if required, respondents could remain anonymous.

1.5. Description of the Study Area

1.5.1. South Africa

The Eastern Cape is the second largest province in area, but one of the most economically depressed in South Africa. Unemployment figures for the first quarter of 2009 indicate that the Eastern Cape had the highest level of unemployment in the country at 28.4 percent (Stats SA, 2009). However, among the Xhosa-speaking population, unemployment figures are much higher than the average for the province at 66 percent (FHISER, 2006). Fifty percent of those who are employed earn less than R500 per month and more than two thirds of households are seen as impoverished (SoE, 2004), indicating the high levels of need and vulnerability of inhabitants of this province.

The widespread poverty in the province may be traced back to the history of the Eastern Cape which saw large areas designated as former 'homelands', namely the Ciskei and Transkei, by the apartheid government (PROVIDE, 2005). The distorted distribution of land by the former government resulted in overcrowded areas reserved for black people (Zenzile, 2007). It was estimated that during the apartheid era, population densities in the former homelands were on average ten times the density of rural 'white' South Africa (Percival and Homer-Dixon, 1995). Rural households are the most affected by poverty in the Eastern Cape, with many families relying entirely on welfare grants – particularly child care grants – for their survival (Molele, 2009). Rural areas are typified by large families which are often headed by females (SoE, 2004). A rapid assessment of service delivery and socio-economic survey of the province conducted in 2006 (FHISER, 2006) revealed that rural households typically comprised elderly providers and young dependents due to large volumes of migration to urban centres by job-seekers.

The distribution of land throughout the province is also indicative of its unequal past. With only four percent owned by the state, by far the majority of land – 66 percent - is privately owned, with the remaining 30 percent being communally owned. Since land settlement patterns are strongly influenced by land tenure systems, there are marked differences between the former 'republic' and 'homeland' areas (SoE, 2004). The privately owned land largely consists of commercial farms and enclosed private

nature reserves. On the other hand, the areas of the former Ciskei and Transkei are made up of open rangelands dotted with homesteads and small towns with minimal infrastructure. The uneven distribution of people in the province is seen as one of the main threats to biodiversity. In heavily populated communal areas there is evidence of overuse of natural resources – particularly medicinal plants (SoE, 2004). Other threats to the natural Grassland and Thicket biomes have been identified as unsustainable agricultural practices, industrial expansion and invasion by alien species. It is also believed that the low capacity within provincial and local government to enforce conservation legislation and educate the public about the importance of the local flora, has contributed to biodiversity loss. (SoE, 2004).

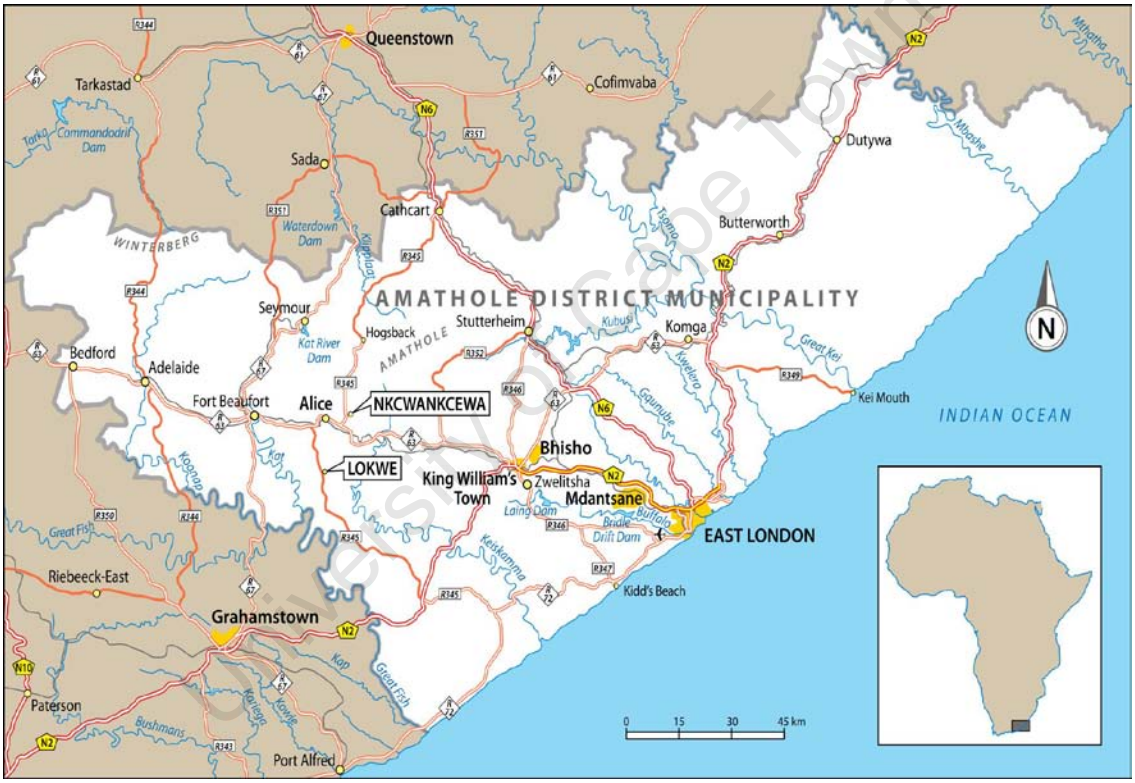


Figure 1: Map of the Amathole District, Eastern Cape Province, South Africa – indicating the field sites selected for research

The field sites selected for this research are situated in the Amathole District of the Eastern Cape Province. The Amathole District Municipality (ADM) includes administrative areas of the former Transkei, Ciskei as well as what was known as the 'Border' area of the former Cape provincial areas (Zenzile, 2007). The ADM consists of a mixture of individual and communal land tenure systems (Zenzile, 2007). The two villages which were studied form part of a group of 23 villages which belong to

the Imingcangathelo Traditional Authority. The communal lands of this clan are distributed around the town of Alice. Some of the land historically owned by the clan is tied up in a disputed land claim (Mathakane, Imingcangathelo Trust, pers. comm., 2009). The first focus group was held near Nkcwankcewa village, situated north of Alice on the road towards Hogsback. Members of this focus group had entered into a benefit sharing agreement with industry. The other community, Lokwe village (previously Victoria Post Farm) is situated south of Alice on the R345. See **Figure 1,** p12. This village is home to a number of community representatives who – along with the ACB and other organisations - have objected to the patents held by Schwabe over *P. sidoides*-based preparations.

1.5.2. Lesotho

When Lesotho gained independence in 1966, more than 40 percent of the Gross Domestic Product (GDP) was derived from agriculture. Reliance on agriculture declined in the following decades, mainly due to unsustainable agricultural practices and the resulting loss of arable land (Chakela, 1999). The post-colonial period has been marked by an increase in poverty levels. Despite growth rates in GDP and relatively stable inflation rates, the majority of the population in the country remains desperately poor (Mokuku *et al*, 2004). In order to relieve their circumstances, 80 percent of Lesotho's population rely fully or partially on subsistence farming (Mokuku *et al*, 2004). However, due to the mountainous nature of the kingdom, only nine percent of the country is arable. This has led to increased competition among farmers and pressure on the environment (Mokuku *et al*, 2004). The staple crop is maize, but wheat, sorghum, oats and vegetables are also cultivated (Chakela, 1999).

Government initiatives to alleviate poverty have focused on labour intensive strategies such as road and dam building, whilst other employment stimulation policies have encouraged an export-based economy with greater reliance on the manufacturing sector (Mokuku *et al*, 2004). Rural lifestyles are typified by low levels of infrastructure development, with only 1.8 percent of rural households supplied with electricity and 2.2 percent of rural dwellings connected to piped water (Lawson, 2007).

Land tenure is almost exclusively based on a communal system. The 95 percent of land which is subject to customary law includes leases held in urban areas (UNECA, 2003) Most Basotho believe the land is held in trust for the nation by the king (UNECA, 2003) and that access to land, water, pasture, woodland and wildlife is unrestricted (Mokuku *et al*, 2004). Before Lesotho was subjected to colonial rule, customary laws played an important role in the conservation of natural resources. However, since the introduction of formal legal systems, customary law has been weakened (Chakela, 1999).

Many Basotho value the traditional use of biological resources for nutritional and medicinal purposes. More than 70 species of plants are edible (Prasad *et al*, 1993, cited in Chakela, 1999) whereas nearly 400 plant species are used for medicinal purposes (Jacot-Guillarmod, 1971, cited in Chakela, 1999). *P. sidoides* occurs in clusters throughout the country and local medicinal uses for humans and animals have been recorded (Newton *et al*, In prep.). However, the sustainability of these valuable resources such as *P. sidoides* is threatened by over-harvesting, the use of herbicides, and the growing human population.

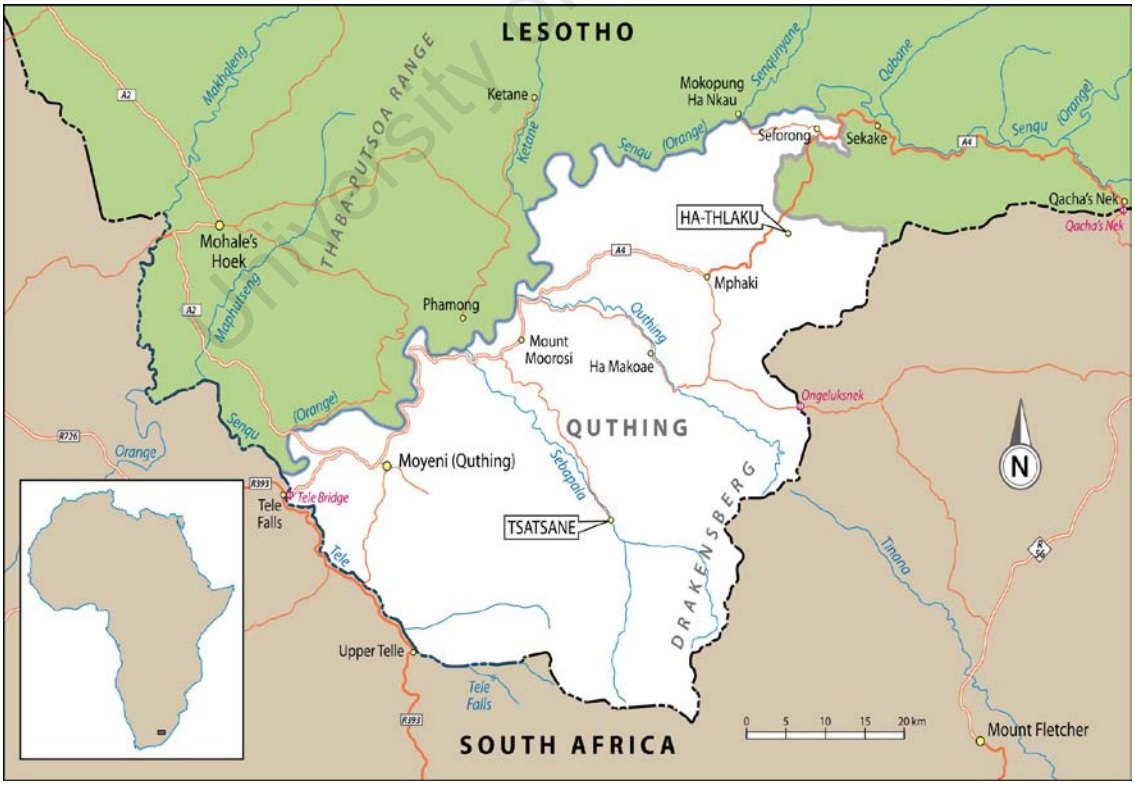


Figure 2: Map of the Quthing District, Lesotho – indicating the villages selected for research

The villages selected for the purposes of this study are situated in the south-western corner of Lesotho, namely Quthing District. The first village visited during the field work was Ha-Thlaku which falls under the jurisdiction of the Mphaki Community Council. The second focus group was held in Tsatsane village, which belongs to the Community Council of the same name. See **Figure 2,** p14. Both villages had been involved in collecting wild *P. sidoides* material and selling it to Bophelo Natural Products since 2007.

1.6. Limitations to the Study

This study was undertaken as part of the MPhil programme in environmental management. This degree consists of one year's course work, followed by a six month research component. This meant that in a period of six months, the literature review, field work, interviews, analysis and final write-up of this dissertation had to be conducted. It is therefore acknowledged that this study is not an exhaustive body of work on the *P. sidoides* trade, but rather an overview of the commercialisation of this species and the key issues it raises with regards to the sharing of benefits from natural resources.

Time constraints necessitated the use of focus group methodology rather than employing household surveys when gathering information from harvesters. One of the focus groups in particular was dominated by an influential member of the community. It is felt that the views of this group may have been better represented without his presence. In order to compensate for possible bias, the views of this community member were recorded and treated as a key informant interview. The second focus group held in the Eastern Cape was poorly attended due to many villagers being absent because of the approaching Easter holidays. The views of the four elderly women who attended were recorded and it was noted that their views may not have been representative of a larger, more diverse sample.

Due to limited time available for the field work component of this study, it was only possible to spend one week in the field in Lesotho. Similarly one week of fieldwork was conducted in the Eastern Cape in addition to the initial visit which was determined by the schedule of the researchers from TRAFFIC and SANBI. This meant that the focus groups were conducted with a limited number of communities, namely

two focus groups per study area. Had there been time to interview more harvesters from more communities, it would have been possible to gather a wider set of data. In Lesotho, the difficult terrain and remoteness of Tsatsane village meant that an ordinary vehicle could not be used. However, this was overcome by joining the group of researchers from TRAFFIC. Due to the remoteness of the villages in Lesotho, arranging a time to meet was complicated – for example in Ha-Thlaku village a text message was sent to the local school which was then passed on to the community by one of the learners.

Budget constraints also impacted on the field work, since it was not possible to travel back to the field site areas in order to conduct in-depth or follow-up interviews. Furthermore, the mother tongues of most of the respondents, namely Xhosa and Sesotho, are not spoken by the researcher - therefore local interpreters were used. Although every effort was made to record all responses, it is possible that some information may not have been translated precisely.

A severe limitation to this study was the unwillingness of industry members to share information regarding volumes of traded material and prices paid along the commodity chain. This reluctance to share information, although characteristic of all natural product industries, was exacerbated due to the patent challenge of the ACB. Industry was suspicious that information gained would be used to generate negative publicity, as they believe had been done by the ACB (Feiter, Parceval, pers. comm., 2009). Furthermore, and perhaps for the same reason as described above, industry was hesitant to share the contents of benefit-sharing agreements which had been concluded at the time of writing. This precluded a further objective of this research – an examination and comparison of the interpretation of the governments of South Africa and Lesotho of access and benefit-sharing arrangements stemming from their ratification of the CBD – from being met.

Unfortunately it was not possible to interview members of the ACB concerning the NGO's involvement in the patent challenges since it was felt by the director that information regarding the patent challenges would be too sensitive to share due to the case being *sub-judice*.

A certain amount of secrecy surrounds the *P. sidoides* trade, not only due to the industry closely guarding sensitive trade information, but also because of the restrictions on wild harvesting in place in both the Eastern Cape and Lesotho during the time that this study was conducted. Because of these restrictions the probability of illegal harvesting taking place was high; therefore some participants may have been reluctant to speak openly about the trade. This was circumvented in part by referring to 'past' harvesting activities instead of referring to the current situation during interviews and focus groups.

1.7. Structure of this Dissertation

This thesis consists of eight chapters. The chapter following this introductory section, **Chapter 2: Literature Review**, provides the context for the *P. sidoides* trade. The first section examines elements of social and distributive justice in the realm of genetic resource extraction. Along with issues of justice, this section presents the concept of livelihood assets and introduces the theory of access which provides a framework for understanding how rural communities benefit from genetic resource extraction. The second section outlines the relationship between rural communities and the natural resources at their disposal. The third section considers the evolution of the global debate around access and benefit sharing and introduces a number of concepts which guide the development of more equitable exchanges of genetic resources.

In **Chapter 3: The Resource - *Pelargonium sidoides***, an account of the distribution, local medicinal uses, pharmacology as well as the effects of wild harvesting and cultivation on the resource base is given.

Chapter 4: The *Pelargonium* Industry, tracks the trade patterns and benefit flow of this species. The historical progression from a crude folk remedy to a fully registered phytomedicine is revealed. Apart from examining the formal and informal local market, the international market and potential for value-adding is further considered. The final section looks at the challenges launched against the patents held in respect of *Pelargonium* extraction methods and preparations.

In **Chapter 5: Legislative Environment** the international agreements and treaties pertaining to the commercialisation of a genetic resource such as *P. sidoides* are highlighted along with the policies and legislation relevant to the trade in both South Africa and Lesotho.

The results of the key informant interviews and focus group sessions are presented in **Chapter 6: Benefits to Communities from *P. sidoides*.** This chapter outlines the contribution of the *P. sidoides* trade to rural livelihoods by tracing the history of harvester involvement in the trade; aspects of the trade such as volumes, financial benefits and non-financial benefits; the viability of commercial cultivation as well as the establishment of benefit-sharing agreements.

Chapter 7: Assessment and Discussion serves to address the objectives of this research by examining the benefits which arise along the lifecycle of the resource from extraction to consumption. The distribution of these benefits among stakeholders along the benefit chain is investigated via access theory, after which the possible causes for unequal distribution patterns are discussed. The second part of the discussion looks at the contribution cultivation of *P. sidoides* makes to rural communities. The final section focuses on an assessment of the social responsibility of the *P. sidoides* trade by analysing the industry's operation through the FairWild Standards.

Chapter 8: Conclusion draws the thesis to a close by bringing together the key arguments laid out in previous chapters and commenting on aspects of social and distributive justice encapsulated by involvement in the *P. sidoides* trade.

CHAPTER 2: LITERATURE REVIEW

2.1. Justice in the World of Genetic Resource Extraction

2.1.1. Social Justice

It is thought that globalisation, along with trends such as reduced manufacturing, technological advances and changing demographics, has contributed to an increasingly unequal distribution of rights, opportunities and resources (Cramme and Diamond, 2009).

The international trade in genetic resources often illustrates the uneven relationship which exists between large corporations with high levels of political, legal and economic power on the one hand and members of small communities with limited capacity on the other (Zerner, 2000). Theorists of social justice are divided as to how such unequal relationships should be addressed as well as the amount of intervention the state should have in the lives of individuals (Merkel, 2009). Some may argue that it is the state's responsibility to provide an equal set of basic goods – including rights, freedoms, opportunities, powers and adequate wealth – to all citizens (Rawls, 1971 cited in Cramme and Diamond, 2009). The international treaty – the CBD – grants states sovereign rights over their natural resources and is meant to facilitate fair and equitable sharing of the benefits arising from the use of genetic resources (Schroeder, 2009). However, despite the notions behind international agreements such as the CBD becoming more widely accepted, it would seem that in an increasingly globalised world, the imbalanced nature of genetic resource exchanges is deepening (Cramme and Diamond, 2009). The regulatory steps that governments of biodiversity-rich countries may take to redress this imbalance are still unclear.

The concept of social justice is much broader than the mere distribution of income and wealth (Miller, 2009). Human dignity and well-being is dependent on the principles of social justice (Brechin *et al*, 2002) which are: the right to participate in negotiations as equal partners; the right to freedom of action; and the right to political, economic, and cultural self-determination. An example of social injustice is demonstrated by impoverished communities who not only suffer from a lack of

power, but often do not have the freedom to choose whether or not to extract a natural resource (Zerner, 2000) due to their lack of autonomy.

Distributive justice is concerned with 'the relative distribution of rights, opportunities and resources within a given society and whether it deserves to be regarded as fair and just' (Cramme and Diamond, 2009, 3). Within the context of genetic resource commercialisation, distributive justice may be improved by the inclusion of the most disadvantaged members of a society (Marshall *et al*, 2003), but if their inclusion simply means that they are providing cheap labour, this is not justice – some form of social upliftment is necessary.

The world's biological diversity abounds in nations where limited technological development has taken place (Macilwain, 1998 cited in Laird and ten Kate, 2002). In these countries, biodiversity is mostly extracted for commercial use by nations with high levels of technological and financial capacity. At a local level, this uneven 'playing field' may result in the exploitation of marginalised communities who are involved in genetic resource extraction. As described, increased globalisation is predicted to exacerbate this situation.

Contrary to the principles of social and distributive justice, the poorest members in most societies are excluded from participating in decision-making and have limited access to income-generating opportunities. Moreover, impoverished communities may be seen to suffer from a lack of assets in relation to other, more powerful sectors of society. The following section introduces the concept of livelihood assets which can be used to illustrate the strengths and weaknesses of societies and communities within societies.

2.1.2. Livelihood Assets

The livelihood assets (also known as capital) shown in **Figure 3,** p21 form part of the sustainable livelihoods framework which was developed in the 1980s as an approach for understanding poverty reduction and rural development (Marshall *et al*, 2006; Scoones, 2009). The framework illustrates how different livelihood assets (e.g. natural, financial, human, and social capital) and livelihood strategies (e.g. agricultural intensification, diversification and migration) result in diverse sustainable

livelihood outcomes. Positive examples of such outcomes are lower levels of poverty or an enhanced sense of well-being, improved food security and higher levels of resilience. In other words, these positive outcomes may be indicative of an increased degree of social or distributive justice.

While rural communities involved in natural resource extraction may have limited opportunities for adapting their livelihood strategies, they may be able to augment their livelihood assets to some extent and thereby positively influence their livelihood outcomes. Whilst impoverished rural communities may typically have sufficient levels of natural and social capital, they may lag behind members of more advanced nations or corporations who possess considerably higher levels of physical, human and financial capital. However, recombination, substitution and exchanges are possible between assets (Scoones, 2009). For example, it is possible to translate social assets such as networks into financial capital by accessing markets.

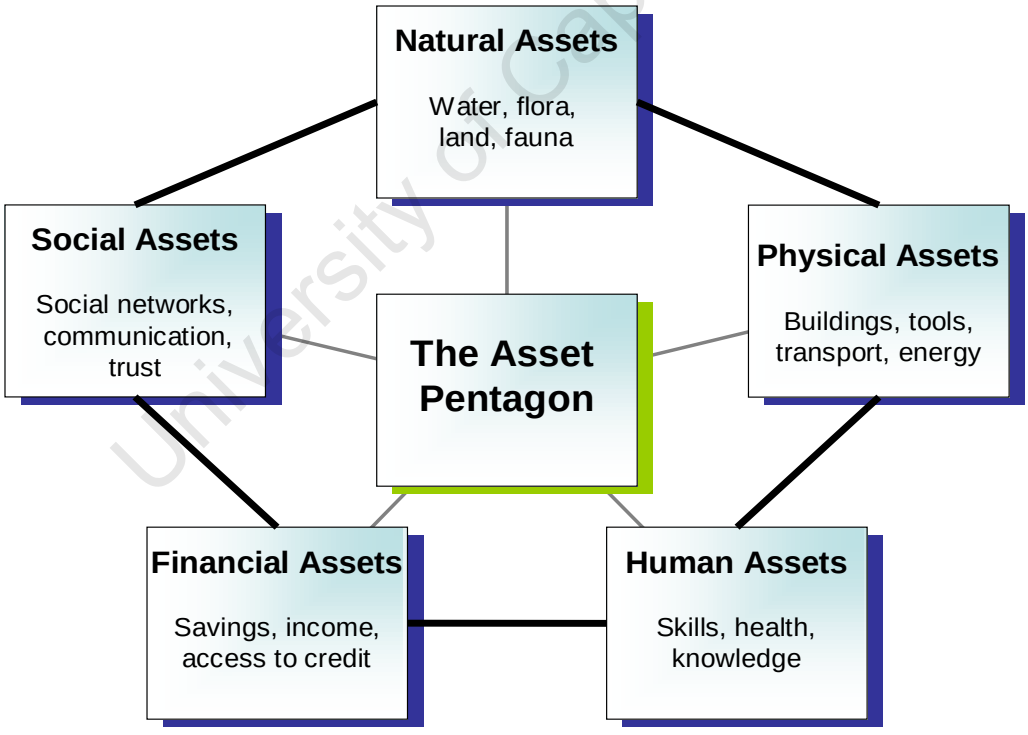


Figure 3: The different types of assets in the sustainable livelihoods framework

Adapted from: Carney, 1998

While the sustainable livelihoods framework and its 'asset pentagon' is a valuable approach for analysing rural poverty, a useful framework which explains how individuals or groups may benefit from the genetic resources at their disposal is proposed by Ribot and Peluso (2003) in their 'Theory of Access.' Certain features overlap in these two frameworks – most notably the concepts of capital and technology.

2.1.3. Access Theory

In order to appreciate the benefits that communities involved in the trade in genetic resources might or might not derive, the concept of 'benefits' has to be understood. Ribot and Peluso (2003) hold that identifying benefits from a particular natural resource potentially involves tracing a complex flow of benefits throughout its life-cycle. Benefits may arise through stages of production (e.g. cultivation), extraction (e.g. harvesting), product transformation (e.g. processing), exchange (e.g. trade), transportation, distribution and finally through consumption of the end product. Once the benefits accruing to individuals or groups along the benefit chain are identified, the mechanisms by which the ability to benefit is gained, controlled or maintained can be studied.

This 'ability to derive benefits from things' is called *access* by Ribot and Peluso (2003) and by substituting natural resources for 'things' the authors provide a framework which explains how people gain access over resources either through direct or indirect means (Kepe, 2008). Direct access refers to property rights or extra-legal means of access such as theft. Parallel to these direct access systems are 'structural and relational' means of access (simply called 'indirect' by Kepe, 2008) such as technology, capital, markets, labour, knowledge, authority, identity and social relations (Ribot and Peluso, 2003).

A legal form of direct access is property. Ribot and Peluso (2003) distinguish between 'property' as the *right* to benefit from things and 'access' - the *ability* to benefit from things, claiming that access includes a broader range of social relationships which determine the level of benefits derived from resource use. Theoretically it could thus be possible to have the rights to benefit from land, but

without indirect elements of access such as labour or capital, no benefits may be realised. Extra-legal means of access to resources such as theft, the use of force or trickery also allow for benefit to be gained, but are of course generally in contravention of accepted social norms (Ribot, 2005).

Indirect elements of access play out differently in various political, economic and cultural arenas. An indirect means of access with vast application is access to capital. Not only can financial 'strength' mean greater participation in the benefit streams of production, extraction, conversion and the mobilisation of labour, it also increases access to funds and equipment – thereby enhancing the use of technology. Resource access may be controlled by buying rights via access to capital. Furthermore, resource access may be maintained by using capital to pay rent or access fees or used to influence those who have control over resources. Another capital means of maintaining resource access is through credit, which is normally only extended to those who have sufficient capital initially. Of course, by having access to capital or wealth, an elevated degree of status and power is achieved. Consequently, enhanced levels of status and power could result in individuals or groups having more favourable rights to indirect elements of access such as production, opportunities, knowledge and authority (Ribot and Peluso, 2003).

Access to technology is closely tied to access to capital and may be as straightforward as fencing off an area to limit physical access or more complex - for example the construction of a road which allows greater physical access to a resource. Advances in technology may mean better participation in processes such as production and extraction to those who have access to such improvements (Ribot and Pelsuso, 2003).

When genetic resources are commercialised, the associated benefits may be more dependent on access to markets than having rights such as property rights (Ribot, 2000). Access to markets is defined by Ribot and Peluso (2003, 166) as 'the ability of individuals or groups to gain, control or maintain entry into exchange relations.' Market entry may depend on factors such as access to capital, numbers of buyers, exclusionary practises, acts of collusion or state policies which regulate access through licences, permits or fees (Polanyi, 1944; Hecht and Cockburn, 1989; Shipton and Goheen 1992; Nelson 1995; Feder, 1996, cited in Ribot and Peluso, 2003).

Therefore real markets are seen as highly structured by a whole range of policy and non-policy, legal and extra-legal mechanisms (Ribot, 1998). Some market forces - such as supply and demand - may be difficult to ascribe to individual actors or actions, but these wider forces still influence how profits (i.e. benefits) are distributed (Ribot and Peluso, 2003).

Those in control of market access often also control labour allocation. This may suggest that labour opportunities (i.e. jobs) are devolved to those with family ties or patronage relationships with others who are in control of access to labour. Just like the broader market forces of supply and demand, the scarcity and abundance of labour determines the relative amount of benefits accruing to those who control labour, those who control access to jobs, and those who want to maintain their access to these opportunities. An actor along the benefit chain may not have access to property, markets or capital but could still gain resource access through working for him- or herself or by building relationships with those in control of resource access. Labour may result in a cash income to the worker or alternatively a share of the harvested material (Ribot and Peluso, 2003).

Knowledge and those who acquire and control it also plays a role in benefit distribution. Some stakeholders may attain 'expert' status through education or access to privileged information which in turn could grant them access to better jobs, wider networks or even enhanced physical access to resources. In the exchange phase of natural resource commercialisation, those in control of knowledge and information may manipulate this inequality in order to enrich themselves. For example, buyers may control prices by lying to uninitiated producers about the true market value of their resource. Also, by withholding details about technology used, knowledge holders ensure that producers remain reliant on them (Ribot and Peluso, 2003).

Laws and those who implement them have significant implications for those who intend to benefit from natural resources. Therefore, access to those individuals who are responsible for laws and their regulation can play a powerful role in benefit realisation. This type of access may be activated through either legal (e.g. permit applications) or extra-legal means (e.g. corruption). Again, those without access to capital may find it almost impossible to interact meaningfully with those in authority

(Ribot and Peluso, 2003). According to Ribot (1998) factors of social identity (also known as social differentiation) such as age, gender, ethnicity, religion, status or place of birth may determine who benefits from a resource too. For example, when land use changes occur, those who are selected to become involved and thus benefit, are often chosen according to their social identity (Menzies, 1988; Thomson, 1991, cited in Ribot and Peluso, 2003).

Finally, Ribot and Peluso (2003, 172) maintain that negotiation of the social relations of 'friendship, trust, reciprocity, patronage, dependence, and obligation' form yet another channel by which resource access is determined. All of the indirect mechanisms of access proposed by Ribot and Peluso are in fact forms of power relations which in various dynamic combinations serve to influence the direct mechanisms of access, namely property and extra-legal access. Ultimately, the combined effect of all these mechanisms determines who gains, controls and maintains access to natural resources.

While the theory of access outlined above draws attention to some of the mechanisms by which benefits from genetic resources are gained, controlled and maintained, the next section of this literature review will investigate the internal composition of rural communities which also plays a role in the way in which genetic resources are accessed.

2.2. Rural Communities and Natural Resources

P. sidoides harvesting in South Africa and Lesotho has historically been carried out by members of rural communities. Although those who live in rural communities may have certain things in common such as communal land tenure systems and high levels of poverty (Cousins, 1999), it is acknowledged that they do not represent a uniform entity. Kepe (2008) warns that rural 'community' members are not indistinguishable from each other, but are rather assigned varying roles according to aspects of social differentiation such as gender, generation, wealth and status. These aspects of social differentiation are in part responsible for different social affiliations which may determine how community members access resources and benefit from them.

One of the consequences of diverse social affiliations is differences in levels of power (Kepe, 2008). Changes in political-economic circumstances bring about changes in an individual or group's status and power within social relationships (Ribot and Peluso, 2003). These differences allow some people to benefit more from natural resources than others (Chambers, 1983 cited in Kepe, 2008). Therefore, the social affiliation of an individual influences the level of power that person has, which ultimately determines his or her access to land and resources (Kepe, 2008). One of the ways in which power may be gained is through accumulated assets such as land, livestock and money. These assets translate into wealth which could potentially be used to gain access to resources by paying off or bribing those in control of resource allocation (Kepe, 2008). This type of extra-legal activity is an example of a direct mechanism of access to resources in the framework proposed by Ribot and Peluso (2003).

Rural community members do not exist in isolation. Through various social and economic networks, rural communities are connected to others in the peri-urban and urban environment. These networks may originate with extended family members, but unfold to incorporate neighbours, community organisations, local markets and eventually remote markets (Cousins, 1999). Again, it is clear that social networks play a very important role in determining the quality of life a member of a rural community may have. In the context of natural resource extraction such as the *P. sidoides* trade, the level of benefit derived by harvesters depends on manifold interactions above and beyond having mere physical access to the resource.

The rural communities involved in the *P. sidoides* trade in both South Africa and Lesotho live in areas where widespread poverty and limited economic opportunities are the norm. Poverty presents a crisis to those living in modern society, for not only does it damage those who have to endure it, but inevitably it will hamper future generations - for children who are hungry cannot develop to their full potential (Wilson and Ramphele, 1989). Whilst urban poverty is undoubtedly widespread, poverty has been found to be most severe in rural societies (Cousins, 1999; Marshall *et al*, 2006).

Members of rural communities may have fewer job opportunities than those living in and around cities, but in contrast to urbanised communities - rural dwellers have at

their disposal a range of natural resources which contribute to their quality of life. These natural resources – often referred to as non-timber forest products (NTFPs), fulfil a variety of functions which range from providing household utensils, building materials, fuel and wild foods to material with medicinal properties (Shackleton and Shackleton, 2004). Additionally, NTFPs may contribute to rural livelihoods by being traded (Shackleton and Shackleton, 2006). Within the areas of southern Africa where *P. sidoides* naturally occurs, harvesters use this NTFP medicinally and in recent times have become involved in its commercialisation.

In the past two decades, global studies have examined the contribution of the commercialisation of NTFPs to rural livelihoods and welfare. These studies are divided as to the benefits such endeavours might bring. On the one hand, reliance on the trade in NTFPs is seen as an important source of income to the poorest members of society and a useful buffer in hard times (Shackleton and Shackleton, 2006; Neumann and Hirsch, 2000). On the other hand, others (Arnold and Ruiz-Perez, 2001) warn that expectations of projected incomes from NTFP commercialisation should not be too high. The returns from selling most NTFPs are marginal and except in the case of the poorest individuals, the financial rewards may not be enough to make a significant contribution to household incomes (Shackleton *et al*, 2008).

The following section moves away from communities and their ability to benefit from genetic resources, to track the evolution of the global debate which has intensified in recent years around the exchange of genetic resources destined for the pharmaceutical and botanical medicine industry. Ultimately of course, those decisions made at an international level will filter down to national and local levels and impact on the relationships rural communities have with the genetic resources in their immediate surroundings.

2.3. Sharing Benefits from Genetic Resources

During the 1980s, change was under way in the bioprospecting world. Countries rich in biodiversity became increasingly aware of the profitability of industries based on the extraction of their natural resources (Gepts, 2004). Furthermore, concerns over the increasing inequality of exchange patterns between user and provider countries

intensified (Laird and Wynberg, 2003). It also became clear that the conservation of biodiversity could no longer be funded alone by private and public entities in developing countries (Richerzhagen and Holm-Mueller, 2005).

Most of these fears were addressed in one of the treaties adopted at the United Nations Conference on the Environment and Development held in Rio de Janeiro in 1992, also known as 'The Earth Summit.' This treaty is known as the Convention on Biological Diversity (CBD) and to date 190 states as well as the European Union are party to it (UNEP, 1994). The CBD strengthens the sovereign rights countries have over their biological resources and their control over access to their resources, as opposed to the prior understanding where biological resources were seen as the 'common heritage' of mankind (Laird and Wynberg, 2003).

The key objectives of the CBD concern the conservation of biodiversity; sustainable use of its components; and the fair and equitable sharing of benefits arising out of the use of genetic resources (CBD, Article 1). The sovereign rights of nations over their natural resources is recognised by Article 15 of the convention which grants governments the authority to establish access and benefit-sharing arrangements through national legislation (Tully, 2003). The combination of the key CBD objectives and these state-held rights form the basis of 'access and benefit-sharing' (ABS) - a new approach to conducting trade in biological resources (Laird and Wynberg, 2003). In a nutshell, a country or company wishing to use a resource has to pass on benefits to those who supply the resource; in return provider countries are required to facilitate access to the resource (Laird and Wynberg, 2003). Put in other words, ABS is an attempt by countries providing genetic resources and knowledge to be included in the financial profits of products derived from their natural resources (Richerzhagen and Holm-Mueller, 2005).

The CBD came into effect in December 1993 and places three main obligations on member states and companies operating within those states. The first obligation requires those interested in bioprospecting to obtain permission before they collect resources and knowledge. This is known as 'Prior Informed Consent' (PIC) (Ni, 2009). While there is no definition for PIC in the text of the CBD, it entails acquiring the explicit permission of a provider country's government before access takes place, upon truthful declaration of the intended use of a resource (Laird and ten Kate,

2002). Apart from obtaining consent from a provider nation's government, consent at a local level – for example from indigenous communities – is not a requirement, but it is implied. Each member state may formulate its own regulations in this regard (Laird and ten Kate, 2002).

The second obligation requires parties to establish the terms of exchange by mutual agreement – called 'Mutually Agreed Terms' (MAT). These terms commonly stipulate the legal requirements for acquisition, permitting arrangements, supply restrictions and the conditions for benefit sharing (Laird and ten Kate, 2002).

Finally, it is expected that benefits are shared fairly with local providers and countries through a process termed 'fair and equitable benefit-sharing' (Laird and Wynberg, 2003). Fair benefit sharing is guided by the CBD and requires user countries to negotiate agreements with provider countries where access to biological resources is rewarded through monetary and non-monetary means (Richerzhagen and Holm-Mueller, 2005). Monetary rewards may be in the form of up-front or milestone payments, royalties on net sales or licensing agreements, although these terms will vary according to country. Non-monetary benefits could take the form of research exchanges, donations of equipment, sharing of technology, joint publications, local economic development, transfer of knowledge, capacity-building or training (Laird and Wynberg, 2008; Richerzhagen and Holm-Mueller, 2005).

In 2002, signatory states to the CBD adopted the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization (the Bonn Guidelines) (Tully, 2003). It was hoped that these voluntary guidelines would support sustainable use of genetic resources by, among others, providing a framework for an international regime on access and benefit sharing. The Bonn Guidelines supplement the CBD by providing practical standards, for example, outlining rules and regulations for establishing PIC (Richerzhagen and Holm-Mueller, 2005). However, some believed that the soft-law nature of the Bonn guidelines were inadequate to prevent the misuse of resources and knowledge, and argued for a legally enforceable international 'access and benefit sharing' regime (Wynberg and Laird, 2007). Originating at the World Summit for Sustainable Development held in Johannesburg in 2002, the regime will eventually consist of a set of legally binding instruments and provide means of ensuring enforcement (Ni, 2009). The

international regime is scheduled to be finalised in 2010. Once these negotiations are concluded, countries may have more clarity on the issues under discussion (Wynberg and Laird, 2007).

In addition to the CBD, other strategies have been developed which attempt to ensure more equitable trade relations around natural resources. One such concept is Fair Trade which originated in order to allow small-scale farmers or growers from disadvantaged communities entry into global markets (Welford *et al*, 2003). One of the key principles of Fair Trade is the protection of human rights through the promotion of social justice, sound environmental practices and economic security (Redfern and Snedker, 2002, 11, cited in Moore, 2004). Coffee, chocolate, sugar, tea, wine, flowers and certain fruit such as bananas are products which have been traded successfully via this alternative system (Nicholls and Opal, 2004). Whereas Fair Trade principles are mostly applicable to small-scale producers of foodstuffs, wild collected products are more easily traced through a comparable and related set of standards – the FairWild Standards (FairWild, 2009).

The FairWild Standards were developed specifically for wild-collected species and consist of a combination of Fair Trade principles and the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP). The twofold objectives of the FairWild Standards are (1) ensuring the future sustainability of the supply chain and (2) assisting collectors of wild products in securing a fair trading system. Collectors, processors and traders involved in the global supply-chain of wild products such as nuts, medicinal and aromatic plants, honey or spices may obtain FairWild Certification through compliance with principles of sustainability and social justice. The ecological soundness of wild collection companies is ensured through adherence to either organic standards or the ISSC-MAP (FairWild, 2009).

Companies involved in the commercialisation of native biodiversity and particularly those supplying natural ingredients to the cosmetic, pharmaceutical and food industries, may be able to support sustainable development through compliance with the principles of the BioTrade Initiative of the United Nations Conference on Trade and Development (UNCTAD). The BioTrade principles stem from the CBD objectives and are concerned with the conservation and sustainable use of biodiversity; benefit-sharing; socio-economic sustainability; compliance with relevant legislation; respect

for the rights of those involved and clarity around land tenure, use and access to natural resources and knowledge. The BioTrade Initiative is not a certification or labelling scheme and does not act in competition with existing systems, but rather supports companies to achieve sustainability in collaboration with other schemes. In order to connect companies which are committed to adhering to the BioTrade principles, the BioTrade Initiative has established the Union for Ethical BioTrade (UEBT). By belonging to UEBT companies will gain from increased capacity building and strong market linkages with other members along the supply chain (UNCTAD, 2007).

This chapter has woven the context in which the genetic resource - *P. sidoides* is extracted and traded. The next chapter, **Chapter 3: The Resource – *Pelargonium sidoides***, presents background information about this medicinal plant from southern Africa around which a substantial international industry has developed.

CHAPTER 3: THE RESOURCE - *PELARGONIUM SIDOIDES*

3.1. Description and Distribution

Pelargonium sidoides has velvety, heart-shaped leaves which are slightly scented (See **Figure 4** below). The flowers are small and range from maroon to nearly black in colour (van der Walt and Vorster, 1988). Underground, the plant has tuberous rhizomes (van Wyk and Brendler, 2008). At first glance, the plant is hard to distinguish from a closely related species, *Pelargonium reniforme* (White *et al*, 2008). However, when in flower the two species can easily be differentiated, since *P. reniforme* has bright pink flowers in contrast to the darker petals of *P. sidoides* (van der Walt and Vorster, 1988).

Figure 4: *P. sidoides* growing in the wild in the Eastern Cape

In cross-section the rhizomes are bright red in colour – typical of a number of *Pelargonium* species which are used in traditional medicine (van der Walt and Vorster, 1988). According to Newton (2009) young tubers are translucent or white but gradually change to pink and finally deep red over a number of years. The exact time scale for this change is being investigated by a study currently underway

(Motjotji, TRAFFIC, pers. comm., 2009). This study will also attempt to discern the rate of tuber re-growth post harvesting.

P. sidoides is indigenous to South Africa and Lesotho and widely distributed throughout both countries (See **Figure 5** below). In South Africa it is found in the Eastern Cape, North West, Free State, Western Cape, Mpumalanga and Gauteng provinces (Newton *et al*, In prep.). In Lesotho it occurs in small clusters, mainly throughout the mountainous regions of the south east and northern areas of the country (Newton *et al*, In prep.). The distribution of *P. sidoides* is much wider than that of *P. reniforme,* which appears to be mostly limited to the Eastern Cape Province of South Africa (Brendler and van Wyk, 2008).

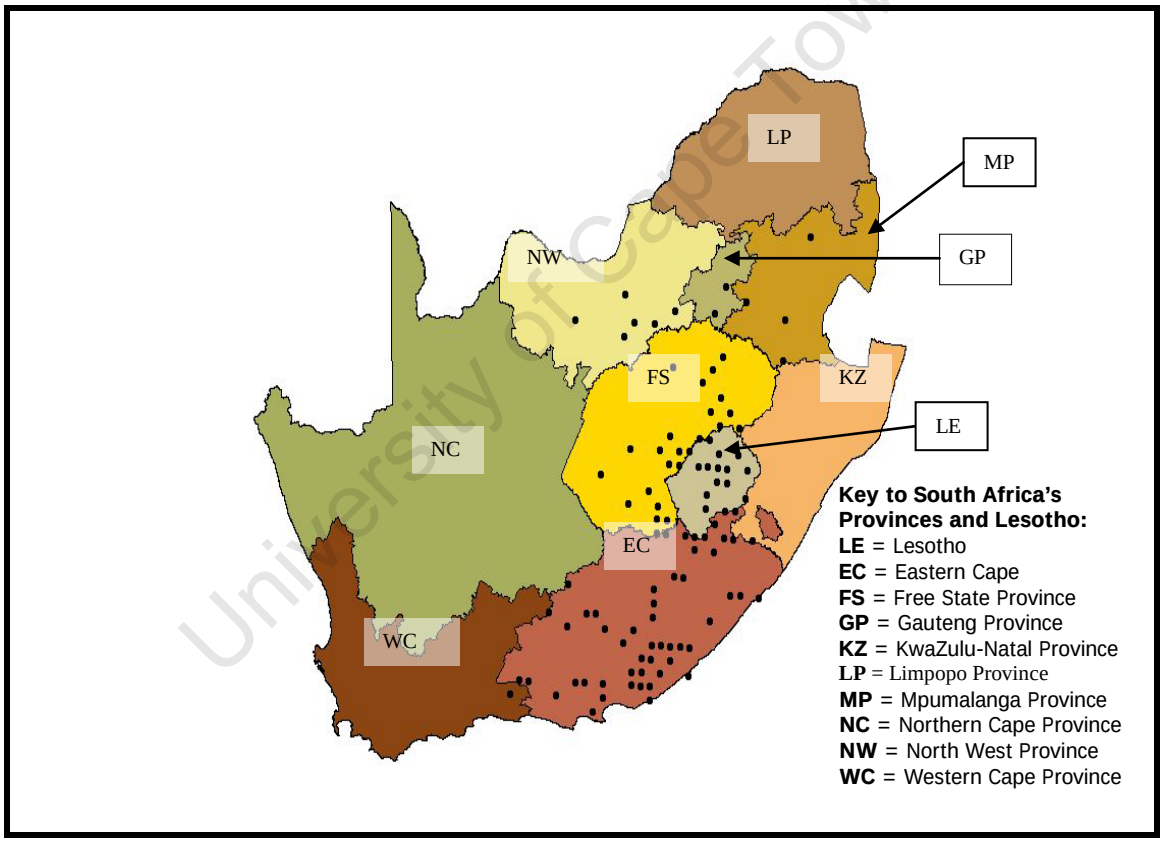


Figure 5: Distribution map for *P. sidoides* in South Africa and Lesotho [Each black dot represents 1 quarter degree square where the species occurs] Source: Newton *et al*, In prep.

According to van der Walt and Vorster (1998), the wide distribution of *P. sidoides* is an indication of its high tolerance for a broad range of environmental conditions. It can be found at elevations from sea-level to nearly 2 800 metres in the highlands of Lesotho. It is often associated with short grasslands and grows on a variety of soils.

Throughout most of its range *P. sidoides* receives summer rainfall of between 200 and 800 mm per annum. During the winter months it is exposed to low temperatures, frost and occasionally snow, but the well-developed underground rhizomes enable it to survive. The rhizomes also allow the plant to endure severe droughts and the frequent *veld* fires which occur across its range.

3.2. Local Medicinal Use

Depending on region and language, many vernacular names are used for *P. sidoides*. The group of red-rooted *Pelargonium* species which are viewed as important medicinal plants are collectively known by the original Khoi name, *rabas* (Brendler and van Wyk, 2008) or the Dutch version *rabassam* (van der Walt and Vorster, 1988). Other common names vary across regions and in some cases their literal meaning may give some indication of their local use. A number of these names and their translations are given in **Table 2,** p35.

To date no thorough ethnobotanical study has been conducted for *P. sidoides* (Brendler and van Wyk, 2008). However, Brendler and van Wyk's (2008) detailed study of the historical literature available for this species, reveals a number of traditional medicinal uses. The earliest recorded use of *P. sidoides* was for dysentery (Harvey and Sonder, 1860 cited in Brendler and van Wyk, 2008; Dold, 2009). A more detailed account by Smith (1895, cited in Brendler and van Wyk, 2008) mentions the treatment of dysentery as well as the use of boiled *P. sidoides* leaves to prevent the infestation of wounds by maggots. The Afrikaans name 'kalwerbossie' indicates its use in cattle. In the Free State province and further north, it is used to treat worms in calves. The only use in Lesotho documented by Brendler and van Wyk (2008) is ascribed to Philips (1917, cited in Brendler and van Wyk, 2008) and refers to colic. Another ethnoveterinarian use is given by Lewu *et al* (2007a) as a remedy for dysentery in cattle. Lewu *et al's* (2007a) three-month long study in the Eastern Cape also revealed that traditional healers (*amaGqhira*) use the tubers of *P. sidoides* for the treatment of diarrhoea and gastritis, particularly in children. Interestingly, the study indicated that the powdered plant material could be formed into a paste which was then applied to the face as sun protection or as a cure for pimples too.

Table 2: Common names recorded for *P. sidoides*				
Region	**Language**	**Name**	**Meaning**	**Author**
	Khoi	*rabas*	unknown	unknown
	Afrikaans	*rabas*		
Not indicated	Dutch	*rabassam*		Smith, 1895
Eastern Cape	Xhosa	*uvendle*	to defecate	Dold, 2000; Lewu 2007
		ikhubalo	charm	Dold, 2000; Lewu 2007
		intolowane	tolo = arrow	Dold, 2000
		umkumiso	used as incense	Dold, 2000
		iyeza lezikhali	medicine of sharp wounds	Dold, 2000
		icwayiba	unknown	Matsililiza & Barker, 2001; Dold 2000
Free State	Afrikaans	*kalwerbossie*	kalwer = calf bossie = bush	Watt and Breyer-Brandwijk, 1962
Lesotho	Sesotho	*khoaara e nyenyane*	growing attached to stone	Phillips, 1917

Adapted from: Brendler and van Wyk, 2008

Other ethnobotanical uses from the Grahamstown area of the Eastern Cape are treatments for gonorrhoea, severe diarrhoea and the relief of colic in infants (Matsiliza and Barker, 2001). The vernacular names recorded by Cocks and Dold (2000) *ikhubalo* and *umkumiso*, respectively meaning 'charm' and 'incense', revealed that the plant may also be used in a spiritual or ritual way.

The preparation methods described for medicinal purposes mostly consist of boiling the sliced or crushed tuber in either water or milk before administering it to humans or animals (Smith, 1895, cited in Brendler and van Wyk, 2008; Lewu *et al* 2007a). Alternatively the leaves of the plant may be pulverised and used on wounds in humans and animals (Lewu *et al*, 2007b).

3.3. Pharmacological Effects

Although most recorded local uses for *P. sidoides* are for gastrointestinal disorders, extracts from the plant are most commonly used for the treatment of bronchitis and other infections of the respiratory tract in the modern botanical medicine.

Acute bronchitis is commonly diagnosed in medical practise (Matthys and Heger, 2007) and especially so in children (Haidvogl and Heger, 2007). Although bronchitis is mostly caused by a virus, physicians often prescribe antibiotics for its treatment (Smucny *et al*, 2004 cited in Matthys and Heger, 2007), which is not ideal. Overusing antibiotics poses the threat of resistance developing (Matthys *et al*, 2007).

Therefore, the use of an herbal product such as EPs 7630 solution, the extract prepared from the tubers of *P. sidoides,* may be a superior choice for patients suffering from acute bronchitis. A host of clinical trials have proven the effectiveness of this preparation, with little or no adverse effects (Brendler and van Wyk, 2008). In an observational study of 2 099 patients, Matthys *et al* (2007, 72) conclude that 'treatment with EPs 7630 is effective in acute bronchitis and, being well tolerated, a useful alternative to the treatment with antibiotics for use outside the strict indication for antibiotic treatment.'

Other studies have investigated the antibacterial, antifungal and antitubercular properties of *P. sidoides*. Mativandlela *et al* (2006) found that extracts from *P. sidoides* showed activity against three bacteria commonly associated with bronchitis. Furthermore, an ethanol root extract of *P. sidoides* was active against two fungal pathogens which commonly affect the respiratory tract. Conversely, extracts of *P. sidoides* did not show any activity against a drug-sensitive strain of *Mycobacterium tuberculosis*, although extracts of *P. reniforme* did display some inhibitory activity.

The tuberous roots as well as above ground parts of the two *Pelargonium* species were thoroughly analysed by Kolodziej (2007) and the results displayed a diverse and complex range of secondary metabolites. These chemical compounds are called 'secondary' since they do not play a role in the plant's primary production system (Swanson, 1995). Kolodziej discovered a marked difference in the contents of certain secondary metabolites – coumarins – in the tubers of *P. sidoides* and *P. reniforme*, making a clear distinction between the two commonly confused species possible.

The tubers of *P. sidoides* contain at least eight distinct coumarins, of which umckalin and 5,6,7-methoxycoumarin are seen as valuable marker compounds (van Wyk and Brendler, 2008). However, White *et al* (2008) caution that the use of umckalin as a bioactive marker for plants with high pharmacological activity, even though it was used as such in their study, requires further investigation.

Despite intense investigation into the chemical compounds of this species, clear grounds for its pharmacological efficacy have yet to be defined (Kolodziej and Kiderlen, 2007). It is more likely that the effectiveness of preparations of this plant – whether crude decoctions or highly technical laboratory extracts – are due to a combination of several elements and their interaction with each other, rather than the effect of a single component (Feiter, Parceval, pers. comm., 2009; Brendler and van Wyk, 2008). Of course, this is typical of a botanical medicine where whole plant material is used in the production of remedies. Botanical medicines are often poorly understood since investigation into the complex web of relationships among active ingredients and their collective function is a costly and time-consuming process (ten Kate and Laird, 1999).

3.4. Wild Harvesting and Conservation

P. sidoides may be widely spread across its distribution range, but this does not mean the plant is resistant to over-exploitation. The increasing demand for raw material for both the local and international markets has led to substantially greater wild harvested volumes in recent times (Lewu *et al,* 2007a). Concern has been expressed around the sustainability of wild stocks and unsustainable harvesting techniques (See **Figure 6,** p38) (Hahndiek, Eastern Cape Nature Conservation, pers.

comm., 2009). Newton *et al* (In prep.) believe that local wild populations may be lost entirely if frequent harvesting occurs, especially in periods of drought.

Concern for the sustainability of wild stocks has initiated the implementation of a management plan for *P. sidoides*. South Africa's National Environmental Management Biodiversity Act (NEMBA) provides for the initiation of Biodiversity Management Plans (Republic of South Africa, 2004b). The key aim of a Biodiversity Management Plan is to ensure the long-term survival in nature of the species which the plan relates to (NEMBA, Section 45). In order to achieve this objective, principles of the Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants required for achieving sustainable wild collection of medicinal plants, will be used as a guide (ISSC-MAP, 2007).

Figure 6: Post harvest digging hole, Eastern Cape. Source: L Motjotji

3.5. Cultivation

One way of addressing the concerns around the sustainability of *P. sidoides* in the wild is to cultivate the plant (See **Figure 7,** p39). Commercial propagation presents several advantages and has been shown to be relatively simple and successful for this species (Lewu *et al*, 2006). Firstly, commercial growing would ensure a reliable supply of the resource to buyers (Schippmann *et al,* 2002) and consumers would be assured that the material was obtained in a legitimate manner. Additionally,

communities may benefit more from growing the plant commercially and thus creating a stable source of income, than by simply relying on wild harvesting which is less reliable as it varies according to the season and the abundance of the resource (Schippmann *et al*, 2002).

Figure 7: Cultivated fields of *P. sidoides* in the Eastern Cape. Source: Q Hahndiek

An encouraging aspect related to the cultivation of *P. sidoides* is the relative ease with which it may be propagated. In fact after harvesting, pieces of tuber are often left behind in the soil and these frequently re-sprout spontaneously (Newton, 2009). Normally after harvesting, the petiole or leafstalk would be discarded; however it is possible to replant this part of the plant (Lewu *et al*, 2006). Other methods of propagation have also been proven to be viable, such as sowing seed and taking cuttings from the tuber (Afolayan and Masika, 2004).

Cultivating young plants requires a certain amount of watering (Feiter, Parceval, pers. comm., 2009). According to the WHO *et al* (1993), irrigation not only leads to greater yield in biomass, but can decrease the chemical variability of medicinal plants, thus providing the industry with a more uniform material. Therefore, from an economic perspective the assurance of reliable, predictable and regular supplies of material with stricter quality control measures makes cultivation a desirable alternative to wild harvesting (Schippmann *et al*, 2002). Moreover, from the perspective of rural communities, cultivation may bring about social benefits such as

job creation and increased income. Communities may also stand to benefit more broadly (i.e. beyond the harvesters themselves to include other community members) if advances such as improved infrastructure accompany cultivation (Wynberg, 2006a).

However, there are a number of disadvantages related to cultivation which should be considered before a commercial growing project is embarked upon. First of all, there are high input costs and investments in time and effort to be considered (Feiter, Parceval, pers. comm., 2009). Access to the specialised methods and equipment necessary for commercial cultivation may not be within reach of all community members, therefore leading to the exclusion of some of those traditionally involved in harvesting (Wynberg, 2006a). In fact, it has been shown that cultivation contributes to unequal resource distribution by enhancing opportunities for the social elite (Homer-Dixon *et al*, 1993). Furthermore, there are risks attached to cultivation if a secure market cannot be found (Feiter, Parceval, pers. comm., 2009). From an environmental perspective the changeover from wild harvesting to cultivation may leave wild stocks at risk if their value is perceived to be lower and therefore incentives for their conservation are removed (Schippmann *et al*, 2002).

While the present chapter has served to fill in the background of *P. sidoides*, the following chapter – **Chapter 4: The *Pelargonium* Industry** – traces the history of the development of a modern botanical medicine from this resource. Thereafter the markets where *P. sidoides* may be bought in its natural or processed form are discussed. The final section in **Chapter 4** discusses the patents relating to this resource.

CHAPTER 4: THE *PELARGONIUM* INDUSTRY

4.1. The History of Contemporary Use

The journey that *P. sidoides* has undergone from a folk remedy known only in southern Africa, to a top-selling botanical medicine available on the shelves of pharmacies and health stores around the world has been a colourful one.

Around the end of the 19th century, tuberculosis was a widespread and serious disease in Europe (Taylor *et al*, 2005). An Englishman, Charles Henry Stevens, was advised by his doctor to spend time in the more agreeable climate of South Africa in order to recuperate after contracting pulmonary tuberculosis. According to legend, he met a fellow sufferer in South Africa who had been cured from the disease and proceeded to introduce Stevens to a traditional healer named Mike Kijitse. This 'medicine man' treated Stevens with a root concoction prepared with an herb he called 'chichitse' (Taylor *et al*, 2005). After three of months of treatment he returned to England and was declared healthy by his doctor. Stevens set about marketing his cure for tuberculosis in the United Kingdom. Initially he achieved some success, but was labelled a 'quack' in a publication of the British Medical Association called 'Secret Remedies: What they cost and what they contain' (British Medical Association, 1909). However, he continued to market his remedy as 'Stevenson's Cure' or the more mysterious 'Umckaloabo' – a name he may have made up according to Brendler and van Wyk (2008). The true origin of this word remains unclear; one possibility being that it is a combination of two Zulu words relating to cold-like symptoms and sharp chest pain respectively (Bladt, 1974 cited in Brendler and van Wyk, 2008). Remarkably, it is still in use today. Stevens never received full recognition for his remedy, yet he tirelessly marketed it under great secrecy as to the identity of the plant ingredient. Upon his death in 1942, Stevens left his company to his son, who sold it to a German medical company (Brendler and van Wyk, 2008).

During the 1920s a French-Swiss physician, Adrien Sechehaye, treated over 800 tuberculosis patients with Umckaloabo, frequently reporting on his successes with cases which were not acute, malignant or complicated (Bladt and Wagner, 2007). Sechehaye continued to treat tuberculosis patients until the 1960s. However, it was not until 1974 that the botanical identity of the cure was finally revealed. The former

Institute for Pharmaceutical Pharmacology at the University of Munich was commissioned by German company ISO-Arzneimittel to investigate the taxonomy of the plant contained in Umckaloabo. Dr Sabine Bladt made the breakthrough after visiting South Africa and studying a root sample from Kew botanical gardens in England. She concluded that the plant material must either be *P. sidoides* or *P. reniforme* and subsequently published her doctorate on the discovery (Bladt, 1974 cited in Brendler and van Wyk, 2008).

According to Waimer (Schwabe, pers. comm., 2009) the first records of Umckaloabo in Germany can be traced back to 1935 when it initially appeared in the so-called 'Red List' of approved medicines. The remedy was marketed in Germany by ISO-Arzneimittel. The Red List could not be published during the Second World War, but Umckaloabo reappeared in 1952 and three years later it was listed along with the medical indication for bronchitis for the first time. The liquid herbal preparation in Umckaloabo has been marketed by ISO-Arzneimittel as EPs 7630 since 1983. Umckaloabo has been one of the Schwabe Group's most popular plant-based products since the company bought out ISO-Arzneimittel in 1987. Intensive research into the effectiveness of Umckaloabo started in the late 1980s and has led to the registration of Umckaloabo as a fully licensed liquid herbal medicine in Germany with proven efficacy, safety and quality standards (Brendler and van Wyk, 2008).

4.2. Local Markets

4.2.1. Informal Local Markets

South Africa – Eastern Cape Province

It is estimated that up to 80 percent of people in Africa rely on traditional medicine for their healthcare (WHO, 2002). In South Africa, the traditional medicine industry was predicted to be worth R270 million in 1998 (Mander, 1998) however this figure is likely to have grown substantially in the past decade (Dold, 2009).

In the mostly rural Eastern Cape Province the trade in medicinal plants plays a vital role in the healthcare of consumers of traditional medicines who may not be able to afford or have access to conventional medicine (Hirst, 1990 cited in Dold and Cocks, 2002). Apart from traditional healers who mostly collect their own medicinal material,

the medicinal plant trade in this province also contributes to the livelihoods of those involved in harvesting and selling the plants (Dold and Cocks, 2002).

Although no specific study has been conducted around the local use of *P. sidoides*, the closely related *P. reniforme* was listed as the 28th most traded plant species in the Eastern Cape by Dold and Cocks (2002). In a survey of plants used in traditional medicine in the Grahamstown area of the Eastern Cape, Matsiliza and Barker (2001) found that one of their informants – a diviner – as well as villagers and patients of a traditional healer they interviewed were familiar with *P. sidoides* and its uses. The extensive local knowledge about the uses of this plant and the fact that it is widely distributed across its range, means that the plant is not regularly traded in local markets in the Eastern Cape (Dold, 2009), but this does not exclude the possibility of the plant being traded in areas where it is not naturally abundant. Villagers who need to treat an ailment with *P. sidoides* would simply go out and collect it for personal use from the *veld* (Dold, 2009).

Lesotho

The local market for medicinal plants in Lesotho has not been studied as rigorously as it has in South Africa. However, given that Lesotho is surrounded by South African territory and shares the same biomes, it goes without saying that many of the medicinal plants found and utilised in Lesotho are identical to those used in South Africa (Shale *et al*, 1999). Many of the plants used in Lesotho are only found in the highland areas, therefore healers from the lowlands rely on highland gatherers to obtain material, or alternatively travel to the highlands to collect plants themselves.

According to Shale *et al's* (1999) study, an experienced traditional healer may see up to 100 patients a month. Costs for treating patients vary widely – starting from as little as R10.00 for a minor treatment and rising up to the value of a cow (or a live animal) for a more elaborate cure. The main threat to medicinal plants in Lesotho was identified by respondents in Letsela *et al's* (2003) study as indiscriminate removal of wild plants by commercial harvesters. This problem was ascribed to the unregulated nature of the plant trade in Lesotho with inadequate control of communally held property rights by traditional authorities.

4.2.2. The Formal Local Market in South Africa

A number of products containing *P. sidoides* extracts are available on the shelves of pharmacies and health stores around South Africa. One of the main suppliers of extracts is Parceval, a company based in the Western Cape which was formerly a subsidiary of Schwabe and continues to be the principal supplier of *P. sidoides* material to the international market (Feiter, Parceval, pers. comm., 2009). Amongst others, Parceval supplies South African companies Nativa and Phyto Nova which both manufacture *P. sidoides*-based remedies aimed at cold care and acute respiratory infections, for example Linctagon which is manufactured by Nativa. Another South African company which markets syrup containing *P. sidoides* is Bioharmony, a long-established manufacturer of complementary medicines.

Essential Amathole is a community-based company situated in the Amathole region of the Eastern Cape Province. The company plans to cultivate plants - both indigenous and not – according to organic principles for essential oils and medicinal extracts. Essential Amathole is based on a community-private-public partnership model with the key aim of creating sustainable jobs in the area and a strong focus on training workers in organic farming practices. Thus far three sites have been identified for potential *P. sidoides* cultivation. The company has submitted a benefit-sharing agreement to the national environmental department in order to obtain a permit before planting from seed will proceed. It is not clear whether the company will supply the local or the international market as they are currently focused on obtaining the permit and have not yet identified a buyer (Fixolo, Essential Amathole, pers. comm., 2009).

4.3. The International Market

The international market for *P. sidoides*-based products is dominated by Dr Willmar Schwabe GmbH & Co – the botanical medicine division of the multinational Dr Willmar Schwabe Group. Dr Willmar Schwabe GmbH & Co (Schwabe) is based in Karlsruhe, Germany and has 696 employees. Research and development is focused on special extracts derived from plants. Total net sales for the Dr Willmar Schwabe Group in 2008 equalled €525 Million; of which €390 Million - in other words 74 percent – was generated by the botanical medicine sector (Schwabe, 2009).

Figure 8: Kaloba, a Schwabe product available in England. Source: R. Wynberg

The total till-point figure for sales in Germany for Umckaloabo – the proprietary name for products based on *P. sidoides* extracts - was €80 Million in 2006 (Brendler and van Wyk, 2008) and according to Dr Waimer of Schwabe, the same figure applies to 2008. Umckaloabo is a top-selling product known as 'Number one for colds' in Germany and it is believed that sales are likely to continue rising in the future (Waimer, Schwabe, pers. comm., 2009).

Clearly such large volumes of raw material could not have been legally sourced only from South Africa and Lesotho in the absence of substantial cultivation projects and in view of the permit restrictions in place in recent months. In fact, during one of the *P. sidoides* workshops it transpired that Schwabe had started sourcing *P. sidoides* from plantations in countries outside southern Africa – for example Kenya and Mexico. This information was first reported by the ACB (2008a) and was confirmed during an interview with Ulrich Feiter – director of the South African company which supplies raw *P. sidoides* material to Schwabe. The reason for this was according to

Mr Feiter, a natural 'move' by a large corporation to secure its supply chain and thereby spread the risk of sourcing from one or two locations only.

The demand for cold-care products containing *P. sidoides* extends beyond Germany to other countries in the European Union, Eastern Europe as well as the United States and plans are underfoot to roll out the product further (Waimer, Schwabe, pers. comm., 2009). *P. sidoides*-based preparations are known by different names such as Umkalor in Eastern Europe, Umcka in the United States and Kaloba in Great Britain (see **Figure 8,** p45.)

Consumers around the world are reached through various partnerships and subsidiaries of the Dr Willmar Schwabe Group. The extent of the reach of the Dr Willmar Schwabe Group globally can be seen in **Table 3** below.

Table 3: Dr Willmar Schwabe world-wide

Austria Austroplant Arzneimittel	**Netherlands** VSM Geneesmiddelen
Belgium VSM Belgium	**Romania** Arzneimittel Schwabe International
China Schwabe Wenex	**Russia** Representative Office
Czech Republic Arzneimittel Schwabe International	**Singapore** Schwabe Pharma Asia Pacific
Germany Deutsche Homoopathie-Union Farmasan Arzneimittel ISO-Arzneimittel Schwabe Extracta Spitzner Arzneimittel Bioplanta Arzneimittel	**Slovakia** Arzneimittel Schwabe international
Hungary Arzneimittel Schwabe International	**Spain** DHU Iberica
India Dr Willmar Schwabe India	**Switzerland** Schwabe Pharma Omida Piniol
Italy Loacker Remedia	**United Kingdom** Schwabe Pharma UK
Mexico Farmasa Schwabe Schwabe Mexico	**United States of America** Nature's Way Enzymatic Therapy

Source: www.schwabepharma.com March 2009

Supplies of *P. sidoides* material from South Africa and Lesotho have historically been routed through Parceval for reasons of quality assurance and logistical efficiency (Feiter, Parceval, email comm., 2009). According to Feiter, this trend looks set to continue in future since any new supplier would first have to comply with the provisions of South Africa's Bioprospecting Regulations in order to extract material. Parceval - formerly a subsidiary of Schwabe, mainly obtains *P. sidoides* material from two intermediary buyers - BZH in South Africa and Bophelo Natural Products in Lesotho. See **Figure 9** below.

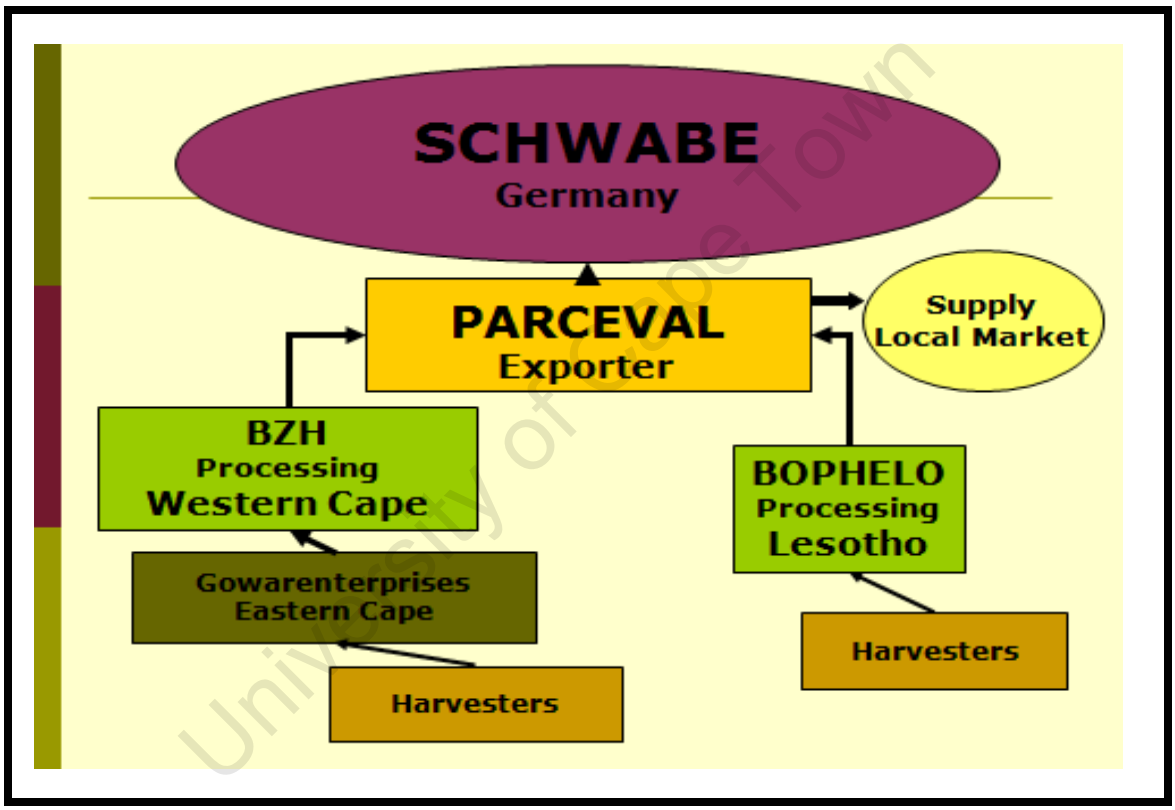


Figure 9: Main supply chain of *P. sidoides* from southern Africa to local markets and Germany

In Lesotho the supply chain is relatively short with Bophelo being directly linked to Parceval; however in the Eastern Cape a second intermediary – Gowarenterprises – completes the supply chain between the harvesters and the processor BZH. This Grahamstown-based company is also involved in the *Aloe ferox* industry. The main links in the *P. sidoides* supply chain are illustrated in **Figure 9,** p48. At both BZH and Bophelo a certain amount of processing occurs, namely: rinsing the tubers by high-pressure hose, steam sterilizing them, shredding them mechanically and then

drying the material for approximately seven hours at 55 Degrees Celsius; finally the material is bagged and transported by road to Parceval in the Western Cape, from where it is shipped to Schwabe.

The reasons for not processing the material any further and thereby adding more value in southern Africa are given by Feiter as economical. Schwabe will only accept extracts which have been prepared in a factory which has attained Good Manufacturing Practice (GMP) standards – a set of principles and specifications for manufacturing medicinal products (GMP Institute, n.d.). Setting up a GMP compliant factory is very expensive – perhaps beyond the scope of most local suppliers. Furthermore, Mr Feiter claims that transporting a concentrated tincture in liquid form is much more expensive than shipping the raw material in bulk, although this is difficult to confirm without knowing the actual transportation figures. According to Dr Waimer, who is in charge of raw materials and processing at Schwabe, the company is investigating whether more value-adding could be done in South Africa, but he admits that the company would be loathe to part with information which is highly technical in nature and which presumably required high levels of investment.

Table 4: Value adding along the *P. sidoides* supply chain

Company	Activity	Price (per kg wet weight)	Increase %	% of final price of tincture
Harvesters	Wild harvesting, replanting	R4		0.7%
Gowarenterprises	Arrange collection times, collect from harvesters, transportation, basic cleaning	R48	1 100%	8%
BZH	Rinse, steam-sterilize, shred, dry and pack	R85	77%	14%
Parceval	Laboratory report, shipping	R120	41%	20%
Schwabe	Extraction of tincture	R600	400%	100%

The prices fetched for *P. sidoides* material along the supply chain are typical of the genetic resource extraction industry (Newton, TRAFFIC, pers. comm., 2009). The following profit margins (See **Table 4,** p48) were revealed by a source who wishes to stay anonymous.

The calculations in **Table 4** are based on wet weight of harvested material; however these calculations do not take into account the costs incurred by the companies involved and therefore profit margins are likely to be significantly lower than indicated here.

4.4. Patents and Patent Challenges

As described, Schwabe holds a number of patents over preparations and extraction methods based on *P. sidoides*. Patents are a form of intellectual property rights which grant the inventor of a new device or product rights over profits generated by the invention – usually for a specific time period such as 20 years. A patent will only be granted once certain criteria are met – it must indicate an inventive step or non-obviousness; it has to be useful; and it should be 'new' – in other words it cannot duplicate something which already exists (ACB, 2008b).

However, certain organisations – such as the African Centre for Biosafety (ACB) - believe that patents are incompatible with genetic resources and the traditional knowledge which often accompanies them (REF). Therefore the ACB, together with the Swiss-based Berne Declaration and the German Church Development Service (EED), have challenged the third and fifth patents in the group below (**Table 5** p50**)** which were granted to Schwabe, at the European Patent Office (EPO) in Munich in March 2008 (ACB, 2008b). Schwabe has applied for patent number three in **Table 5** in South Africa as well – an action which the ACB has also opposed (ACB, 2007b).

The patents depicted in **Table 5,** p50 are a selection of those currently held in respect of *P. sidoides*. These patents often include *P. reniforme* too.

Table 5: A number of patents held in respect of *P. sidoides*			
Title	**Number**	**Publication Date**	**Applicant**
1. Quantitative analysis method of *P. sidoides* syrup or solution	WO 2009/011499	22/01/2009	Dr Willmar Schwabe GmbH & Co
2. *P. sidoides* syrup	WO 2009/011498	22/01/2009	Dr Willmar Schwabe GmbH & Co
3. Use of *Pelargonium* for the treatment of behavioural changes	EP 1 684 775 B1	26/03/2008	Dr Willmar Schwabe GmbH & Co
4. Dry extracts of *P. sidoides* and *P. reniforme*	WO 2008/125239	23/10/2008	Dr Willmar Schwabe GmbH & Co
5. Right over extraction methods for the 2 *Pelargonium* species	EP 1429 795 B1	13/06/2007	Dr Willmar Schwabe GmbH & Co
6. Use of *P. sidoides* and *P. reniforme* root extracts	WO 2006/002837	12/01/2006	ISO Arzneimittel GmbH & Co
7. Use of extracts from the *Pelargonium* species	WO 2005/041993	12/05/2005	ISO Arzneimittel GmbH & Co
8. Method for producing extracts of *P. sidoides* and /or *Pelargonium*	WO 2003/028746	10/04/2003	ISO Arzneimittel GmbH & Co

Source: WIPO, 2009; ACB, 2008b; EPO, n.d.

The ACB's objections are based on the following grounds: firstly they claim that Schwabe failed to obtain prior informed consent from traditional knowledge users in South Africa and Lesotho; secondly they assert that patenting extraction methods from the plant amounts to patenting the plant itself – which is not allowed by the European Patent Convention; lastly, the NGO feels that the extraction method which has been patented is not novel and therefore does not indicate an inventive step (ACB, 2008b). A number of community members from villages previously involved in harvesting *P. sidoides* in the Eastern Cape and a South African botanist have filed affidavits in support of the patent challenges at the European Patent Office (EPO, n.d.).

The ACB was introduced to the Lokwe community by a local botanist and claims to represent the Lokwe community which holds traditional knowledge of *P. sidoides*. The NGO has used the case to create international awareness about the unequal power relationships which exist between rural southern African communities involved in harvesting medicinal plants and multinational companies such as Schwabe. They are hoping to highlight the unfairness which surrounds the patenting of *Pelargonium*-based extracts – which ultimately may render the local medicine unaffordable for the very people who first used it. Further, the NGO wants to emphasize the fact that resources and traditional knowledge from the south are misappropriated by companies in the north (ACB, 2008a).

In response to a question regarding the ACB's activities, Waimer from Schwabe acknowledges that representatives from Schwabe resent the fact that they are being labelled as 'bio-buccaneers', yet they do not feel that the ACB will win the case. Waimer concedes that the ideals of the CBD clash with international patent laws, but contends that Schwabe needs the patents in order to secure the €30 Million the company has thus far invested in research and development of *Pelargonium*-based medicines.

Apart from opposing the patenting system for natural resources and the traditional knowledge often associated with natural resources, the ACB argue that benefit-sharing agreements (BSAs) deprive indigenous communities of control over the rights to their natural resources and do not provide any real benefits (ACB, 2007). Echoing the words of Shiva (2006) on the detrimental effects of benefit-sharing arrangements, the ACB hold that paying communities for access to their resources and knowledge through royalties or other means deprives them of rights over their own knowledge (ACB, 2007).

The preceding sections discussed the history of the contemporary use of *P. sidoides* and the relationships and linkages between members of the *P. sidoides* supply chain. Furthermore, the actions of a South African NGO opposing the involvement of industry in patenting and commercialising *P. sidoides* were briefly explained. The next chapter – **Chapter 5: Legislative Environment** – sets out the legislative measures applicable to the *P. sidoides* trade in South Africa and Lesotho.

CHAPTER 5: LEGISLATIVE ENVIRONMENT

5.1. South Africa

International Agreements

South Africa became party to the Convention on Biological Diversity (CBD) on 2 November 1995 (Wynberg, 2006b). As a member state, the three-fold obligations of obtaining PIC, agreeing on MAT and engaging in fair and equitable benefit sharing apply to South Africa (Laird and Wynberg, 2003). Since South Africa is a member of the World Trade Organization (WTO), the Trade Related Intellectual Property Rights Agreement (TRIPS) agreement of 1995 applies to the patenting of genetic resources found within South African territory (Laird and Wynberg, 2003). This global patent system requires WTO member states to provide strong protection for intellectual property rights in order to safeguard knowledge seen to be in the public domain and thus open to exploitation (Tedlock, 2006; Bodeker, 2007). TRIPS may be applied to inventions in technology, cultural practises such as music or dance, as well as plant varieties which are expected to be protected through patents or *sui generis* (unique) systems, or a combination of both (Shiva, 1996). No mention is however made within TRIPS of the protection of traditional knowledge; in fact no distinction is made between knowledge that may be held by indigenous communities and knowledge held by industry (Bodeker, 2007).

As a member of the Group of Like-Minded Mega-diverse Countries (LMMC), formalised in 2002, South Africa demonstrates its commitment to the promotion of fair and equitable sharing of benefits derived from genetic resource use (Wynberg, 2006b). The LMMC Group comprises 17 countries which together represent 70 percent of the world's biodiversity and 45 percent of its population. The Group has become a formidable block in the negotiations for the International Regime on Access and Benefit-Sharing within the United Nations CBD (Ministry of Environment and Forests, 2005).

On a continental level, the African Union (AU) (of which South Africa is a prominent member) adopted a Model Law in 1999 which aims to protect the rights of rural communities, farmers and breeders in a manner which is in harmony with African traditions and cultures (Laird and Wynberg, 2003).

Policies

The first national policy to address access and benefit sharing in South Africa was the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity of 1997 (DEAT, 1997). Making sure that South Africa and its people benefit from the use and development of the country's genetic resources is one of the main aims of the policy. A key objective in support of this aim is the establishment of legislative and institutional mechanisms which would regulate access to indigenous genetic resources (Wynberg, 2006b).

More broadly, the 1999 White Paper on Environmental Management Policy outlines the vision and objectives related to environmental management and sustainable resource use and emphasises the principle of cooperative governance (Wynberg, 2006b).

South Africa's National Biodiversity Strategy and Action Plan, which was launched on 22 May 2006, guides the country's conservation and management of biodiversity whilst allowing for human development through sustainable biodiversity use. A number of strategic objectives guide resource management in line with South Africa's commitments under the CBD. One of the objectives, which encourages the promotion of human development and well-being through sustainable biological resource use, also recognises the importance of indigenous knowledge of biological resources and their use. A five-year target under this objective outlines methods of attaining and retaining equitable access to natural resources, such as benefit-sharing agreements and permitting arrangements (Republic of South Africa, 2005b). This objective is addressed through the National Environmental Management: Biodiversity Act of 2004 and its Regulations on Bioprospecting, Access and Benefit-Sharing (Republic of South Africa, 2004b; Republic of South Africa 2008b) and has newly been put in practice in the *P. sidoides* industry.

In 2004, the South African government adopted the Indigenous Knowledge Systems Policy which aims to reinforce the role of indigenous knowledge within South Africa's society and economy (Wynberg, 2006b). Key focus areas of the policy are protecting indigenous knowledge holders from exploitation and ensuring that communities supplying such knowledge are recognised and where applicable, compensated (Republic of South Africa, 2008a).

National Legislation

The Constitution of the Republic of South Africa (No. 108 of 1996) emphasises in its Bill of Rights (Chapter 2) the importance of conservation of natural resources and the assurance that development is ecologically sustainable (van der Linde, 2006). The National Environmental Management Act (No. 107 of 1998) (NEMA) is the legal framework which ensures that the environmental rights guaranteed in the Constitution are realised (van der Linde, 2006) as well as giving legal effect to the White Paper for Environmental Management (Wynberg, 2006b).

The National Environmental Management: Biodiversity Act of 2004 (NEMBA) provides for the management and conservation of South Africa's biodiversity as outlined by NEMA (van der Linde, 2006). Chapter 6 of NEMBA sets out the framework for the regulation of bioprospecting, access and benefit-sharing of natural resources. The definition for 'bioprospecting' is rather broad (Wynberg, 2006b), namely:

> **"bioprospecting",** in relation to indigenous biological resources, means any research on, or development or application of, indigenous biological resources for commercial or industrial exploitation, and includes-
> *(a)* the systematic search, collection or gathering of such resources or making extractions from such resources for purposes of such research, development or application;
> *(b)* the utilisation for purposes of such research or development of any information regarding any traditional uses of indigenous biological resources by indigenous communities; or
> *(c)* research on, or the application, development or modification of, any such traditional uses, for commercial or industrial exploitation;

This broad interpretation has been problematic for legislators. Currently, the national department considers the development of new or novel products from natural resources to be activities representative of bioprospecting. Carina Malherbe, Deputy Director of Resource Economics in the former Department of Environmental Affairs and Tourism (DEAT), uses the example of rooibos tea, a popular health drink made from an indigenous bush, to illustrate. If the plant is harvested and sold for tea, it would be seen as trade and not bioprospecting. However, if an extract of the plant was mixed with a medicinal compound and used in a cream – this would be viewed

as a new use – and therefore would qualify as bioprospecting. Nevertheless, this interpretation does not clarify whether the use of *P. sidoides* as a formal medicine is 'new' and is therefore seen as bioprospecting.

Section 82 of NEMBA sets out provisions for the protection of those granting access to a resource or indigenous communities who hold knowledge related to a resource. This section was amended on 27 May 2009 to include specific individuals as knowledge holders too (Republic of South Africa, 2009). These amendments will possibly come into force in early July, 2009 (Malherbe, DEAT, pers. comm., 2009). Only when satisfied that those stakeholders are informed and protected, will the authority issue a permit. The requirements for benefit-sharing agreements are set out in Section 83. Among others, the type; area or source; quantity; traditional uses and present potential uses of a resource has to be supplied in the prescribed format (van der Linde, 2006). Section 85 of the Act relates to the Bioprospecting Trust Fund into which moneys arising from benefit-sharing agreements would be paid. The Trust Fund is administered by the Director-General of the national Department or, as stated in the amendment of 27 May 2009, by an appointed trustee. According to Malherbe (DEAT, pers. comm., 2009) it was initially envisioned that money accumulated in the Trust Fund would accrue interest which would then be disbursed at the discretion of the Minister.

On April 1st 2008 the NEMBA Regulations on Bioprospecting, Access and Benefit-Sharing came into force. These regulations set out the prescribed format, contents and requirements of benefit-sharing agreements and further regulate the permit system. Additionally, the regulations govern the discovery and commercialisation phase of bioprospecting projects and the export of indigenous biological resources from the Republic (Republic of South Africa, 2008b). The *P. sidoides* trade is one of the first industries in the country to comply with the NEMBA Regulations through establishing benefit-sharing agreements with communities involved in harvesting.

The Patents Act of 1978 (No. 57 of 1978) was amended in 2005 by the Patents Amendment Act (No. 20 of 2005) to require patent applicants to disclose information about the role of indigenous biological resources, genetic resources or traditional knowledge which may have been used in an invention (Republic of South Africa, 2005a). Schwabe has applied for a patent relating to the use of *P. sidoides* for the

treatment of behavioural changes associated with illnesses in 12 countries outside Germany – including South Africa. The ACB has opposed the granting of this patent in South Africa (ACB, 2007b).

Provincial Legislation

Currently, environmental conservation is regulated by separate pieces of legislation which still correspond to the former homeland and provincial divisions of the Eastern Cape Province. However, the long-awaited Eastern Cape Conservation Act - which is supposed to come into force in 2009 (Hahndiek, Eastern Cape Nature Conservation, pers. comm., 2009), will repeal most of these documents in full and provide a comprehensive framework for nature conservation in the province. It is expected that *P. sidoides* will be listed as a protected species in a schedule to this act, which will facilitate management of the resource (Hahndiek, Eastern Cape Nature Conservation, pers. comm., 2009).

The pieces of legislation which currently apply to *P. sidoides* are:

> The Nature and Environmental Conservation Ordinance, 1974 (Ordinance No. 19 of 1974) Cape Province (Cape Province, 1974);
> The Nature Conservation Act, 1987 (Act No. 10 of 1987) Republic of Ciskei (Republic of Ciskei, 1987); and
> The Environmental Conservation Decree, 1992 (Decree No. 9 of 1992) Republic of Transkei (Republic of Transkei, 1992).

Within the former Ciskei region, all plant species are listed as protected, except when classified as specially protected or unprotected as per Schedule 5 and 7 of the Nature Conservation Act, 1987. Therefore, in the former Ciskei region of the Eastern Cape Province, *P. sidoides* is a protected species and permits are required for harvesting it (Bam, DEDEA, pers. comm., 2009). According to the relevant legislation, in the former Transkei and Cape Provinces it is not listed as protected.

However, concern regarding the exploitation of *P. sidoides* and *P. reniforme* raised by the national department and inquiries from NGOs around the export and patent rights to these species prompted the Department of Economic Development and Environmental Affairs (DEDEA) of the Province of the Eastern Cape to impose a

temporary ban on the granting of harvesting permits on 16 May 2007. The deputy director of Biodiversity Conservation Management in the Eastern Cape Province, Noluthando Bam, explains that this ban was not a 'moratorium' as such, since it was never gazetted.

Notwithstanding the ban on wild harvesting and various permitting restrictions in place prior to the ban, signs of illegal harvesting taking place are evident. Until 2004 all wild harvesting taking place in the Eastern Cape was illegal (Newton, In prep.) and due to non-compliances with permitting arrangements, most of the harvesting since 2004 from the province has also been illegitimate (Bam, DEDEA, pers. comm., 2009). Local buyers from Gowarenterprises have been arrested several times in the Eastern Cape for permit transgressions (Bam, DEDEA, pers. comm., 2009). However, according to Hahndiek from Eastern Cape Nature Conservation, no successful prosecutions have been made to date since, according to the state prosecutor, the current legislation protects land owners rather than the plant species. In terms of the current legislation, plants may not be uprooted when they are picked; but they may be harvested on private land as long as the landowner grants written permission.

5.2. Lesotho

The international agreements which have been ratified by the government of Lesotho and the national legislation pertaining to biodiversity are summarised in **Table 6** below.

Table 6: International agreements, national policies and legislation in Lesotho

Name	Date	Details
International Treaties and Conventions		
Lusaka Agreement on Cooperative Enforcement Operation directed at the Illegal Trade in Wild Fauna and Flora	1996	

Convention on Biological Diversity	1995	Global Environment Facility – the funding arm of the Convention – provided funding for the development of Lesotho's National Strategy and Action Plan
Convention on the International Trade in Endangered Species of Wild Fauna and Flora	1973	Signed in Washington DC
Convention on the Protection of Flora and Fauna	1933	With reservation in respect to Article 10
Policies		
National Action Plan to Implement Agenda 21	1994	Framework for sectors to integrate environmental concerns into strategies; strengthen coordination in environmental planning
National Environmental Action Plan	1989	Framework for incorporating environmental issues into economic development
National Legislation		
*The Environment Act	2009	Repeals the Environment Act of 2001
Local Government Act	1997	Grants Community Councils control over natural resources; environmental protection and other communally owned property
Historical Monuments, Relics, Fauna and Flora Act 41	1967	Permit necessary to harvest floral resources List of protected plants amended by Legal Notice No 93 of 2004 to include *P. sidoides*

Source: Chakela *et al*, 1999; Newton *et al*, In prep.

* More information below

*The new Environment Act, promulgated in June 2009, contains a number of sections which are relevant to the *P. sidoides* industry. The Act provides for the protection and management of the environment as well as the conservation and use of natural resources - based on the principles of sustainability.

Most relevant to this research, section 66 (1) (b) (vi) allows for the Director of the Department of Environment in consultation with the relevant Line Ministry, to issue guidelines which will integrate traditional knowledge for the conservation of biological diversity with mainstream scientific knowledge. Further, access to genetic resources is controlled by the provisions of section 68 which stipulates that the Director of the Department of Environment, in consultation with the relevant Line Ministry, shall issue guidelines which specify -

(a) appropriate arrangements for access to the genetic resources of Lesotho by non-citizens or non-residents of Lesotho and fees to be charged for that access;
(b) the sharing of benefits derived from genetic resources of Lesotho; or
(c) any other matters that the Director may consider necessary for the sound management of the genetic resources of Lesotho.

Penalties and fines for non-compliance with the sections listed above amount to a maximum of M5, 000 or a prison term up to 2 years, or both. In terms of this Act, 'Line Ministry' is defined as 'a Ministry, Department, parastatal or agency in which any law vests functions for the protection, conservation or management of any segment of the environment or whose activities may have an impact on the environment as defined in this Act.'

Through a set of Regulations which have not yet been drafted, the Act makes provision for an environmental impact assessment (EIA) to be performed according to a list of activities published in the First Schedule (Part A). According to section 12 (b) of this Schedule, an EIA would be necessary in the event of commercial exploitation of natural fauna and flora. Section 113 (2) (c) stipulates that the regulations also provide for the protection of any particular species of fauna and flora; and in (d) control or restriction of access to genetic resources are provided for as well as fees related to accessing germplasm and an export licence. Further, section 113 (2) (h) allows for the implementation of environmental management

plans.

According to Ms Ntoshi (pers. comm., 2009) from the National Environmental Secretariat, the biggest obstacle for the industry is the fragmented and overlapping nature of Lesotho's environmental legislation whereby permits to harvest are issued by one authority and manufacturing licences and export permits are controlled by another. This situation is supposed to be addressed when the long-awaited umbrella Conservation Bill is enacted by the Department of Culture.

Extensive illegal harvesting which had taken place in the northwest of the country had led to the listing of *P. sidoides* as a protected species in 2004. However, to date it seems that the existing legislation has not been adequate to put an end to illegal harvesting, although according to Ms Ntoshi, it appears that incidences of illegal harvesting were decreasing. Ms Ntoshi admits that of the cases regarding unlawful collection which have been heard in court, none have been successfully prosecuted.

The next chapter, **Chapter 6: Benefits to Communities from *P. sidoides*** provides an overview of the experiences of those involved in the *P. sidoides* trade, with a focus on the benefits harvesters may have derived from their involvement in the industry. It concludes with a summary of the key findings of this study.

CHAPTER 6:
BENEFITS TO COMMUNITIES FROM *P. SIDOIDES*

6.1. Introduction

Socio-economic data from the Eastern Cape and Lesotho where most *P. sidoides* harvesting takes place depicts areas with high levels of need and poverty and limited opportunities for social advancement. In rural areas of the Eastern Cape Province there are high levels (74 percent) of reliance on government grants (FHISER, 2006) and average minimum wages for agricultural workers are low - having risen from R27 per day in 2001 to R47 per day in 2008 (Republic of South Africa, 2007). This would mean that the monthly wage for an agricultural worker has risen from R513 in 2001 to R893 in 2008.

In Lesotho, the average monthly salary for an unskilled labourer is similar to that of an agricultural worker in the Eastern Cape – it was estimated at 653 Maloti (roughly equivalent to the Rand) in 2005 (GPN, 2006) which amounts to around R34 per day. However, poverty may be even more deeply entrenched in Lesotho since the country is listed as one of the 50 most impoverished nations in the world. Socio-economic statistics such as a 35 percent HIV positive rate and one of the highest unemployment rates in the world (52.4 percent) (GPN, 2006) support this statement (Aneki, 2009).

It is clear from these statistics that involvement in a new industry such as harvesting *P. sidoides* must be a welcome addition to limited rural livelihoods in the Eastern Cape Province of South Africa and in Lesotho, but on the other hand such high levels of need and destitution are also indicative of a society which is vulnerable and at risk of being exploited.

This chapter explores the results of key informant interviews and focus groups conducted during this research. By tracing the history of the involvement of harvesters in this industry, the benefits which arise through commercialising *P. sidoides* are identified. Along with the benefits harvesters may enjoy, the power relationships between communities and traders are also examined. Furthermore, the

extent of the volumes of *P. sidoides* traded, commercial cultivation and the new legal requirement of benefit-sharing agreements for stakeholders in this industry are looked at.

6.2. History

In 1995, German pharmaceutical Schwabe was approached by Ulrich Feiter from the **South African**-based firm Parceval to buy various medicinal plants. Schwabe did not want to buy Mr Feiter's medicinal plant material, but informed him that they were searching for a new supplier of *P. sidoides*. Thereby their relationship as importer and exporter respectively of raw *P. sidoides* material from southern Africa started. Initially commercial cultivation was undertaken, but broader marketing of Umckaloabo and therefore increased demand meant wild harvesting was also conducted. This was mostly concentrated in the Eastern Cape and started around 1997 (Feiter, Parceval, pers. comm., 2009). Reportedly, large scale commercial harvesting intensified in the Eastern Cape in 2001 (Newton, In prep.).

Harvesting *P. sidoides* started in **Lesotho** around the end of 2003 when complications with permitting arrangements drove buyers from the Eastern Cape further north in search of sources of raw material (Newton, *et al*, In prep.). Similarly, when the ban on *P. sidoides* harvesting was implemented in the Eastern Cape in 2007, wild harvesting increased in Lesotho (Nieuwoudt, Bophelo, pers. comm., 2009). Due to the higher altitude and colder winters in Lesotho, the harvesting season here is shorter than in the Eastern Cape – usually seven months long as opposed to eight months in the Eastern Cape (Newton, In prep.).

The harvesters from the Alice area in the **Eastern Cape** became involved in the industry between 2002 and 2005 (depending on the village). Many of them were already supplying *Aloe ferox* to Gowarenterprises and it is this local buyer who informed them of the commercial importance of *P. sidoides*. Similarly, harvesters from the Quthing District in Lesotho started wild collecting in 2007 after the buyer from Bophelo Natural Products came to their villages and informed them of the value of the resource. In both countries harvesters signed up voluntarily and were motivated to do so by the fact that they could earn some cash with which to supplement their livelihoods.

6.3. Harvester Involvement in the *P. sidoides* Trade

It is difficult to estimate the scale of harvester involvement in the *P. sidoides* trade since harvesting alternated between different locations (Hahndiek, Eastern Cape Nature Conservation, pers. comm., 2009). Harvesters who responded to the focus group questions were unable to say how many people were involved in the trade. However, historical harvesting records for the Alice and Healdtown areas of the Eastern Cape give some indication of the numbers of harvesters involved during this period. These records show that a total of 317 harvesters from 11 villages were involved in 2005 (DEAET, 2005), but of course this does not mean that harvesters from other areas were not active at the time too.

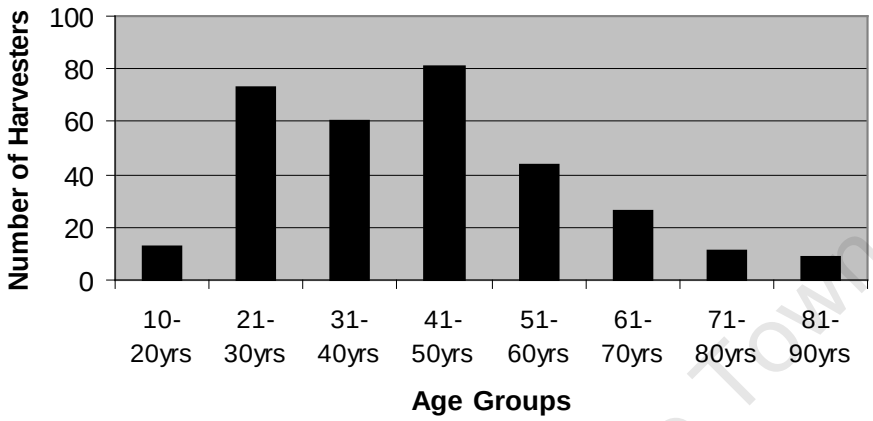
In the village of Tsatsane in Lesotho, harvesters reported that out of the nine neighbouring villages in the area, a total of 63 people had been trained by members of the industry in sustainable harvesting techniques. However, harvesters and chiefs in the two study sites were unable to provide data relating to total numbers of harvesters since no records were kept at the community level. According to Mr Nieuwoudt from Bophelo Natural Products the industry in the entire country – that is south-western Quthing District and northern Botha-Bothe District where harvesting is focused - could potentially involve between 700 and 800 collectors. Mr Nieuwoudt estimates that around 500 harvesters would be active in Quthing District and between 200 and 300 in Botha-Bothe.

There seems to be little social differentiation along gender lines amongst harvesters in **South Africa** and **Lesotho** – both men and women are involved, although harvester records for the Alice and Healdtown areas of the **Eastern Cape** for 2005 indicate that the proportion of women involved (55 percent) was slightly higher than that of men (DEAET, 2005).

The harvesters who attended the focus groups represented a range of age groups. The ages of harvesters in Lesotho were not investigated, but again harvester records from the Eastern Cape in 2005 give some indication: those between the ages of 40 and 50 represented the largest percentage at 25 percent; this corresponds with the findings of Lewu *et al's* (2007a) study. As far as minimum and maximum ages are concerned, only two harvesters under the age of 18 were enlisted; however nine of

the harvesters were above 80 years old and in fact two members of this age group were 88 years old at the time (DEAET, 2005). See **Figure 10,** below.

Figure 10: Harvester's Ages: Alice and Healdtown Districts, Eastern Cape 2005



Source: DEAET, 2005

Institutions

The communities involved in harvesting *P. sidoides* in **South Africa** and **Lesotho** have similar tenure systems and the land they occupy and where the resource is found is controlled by customary law. Communal property tenure is complex in nature since many resources are located in the commons (Kepe, 2008). However, far from access to resources being randomly allocated, it is instead in many cases determined and harmonized by local practises and institutions (Kepe, 2008; Leach, 1997 cited in Cousins, 1999). From the focus groups held for this study, it can be seen that access to *P. sidoides* does not occur in a random fashion, but is rather controlled by those who are in charge of the communal land. The following section highlights some of the local practises and institutional structures which are apparent in the communities where the focus groups were held.

The **Eastern Cape** communities which were visited during this research belong to the Imingcangathelo Clan. Members of the clan – led by Chieftainess Tyali, live in 23 villages dotted around the town of Alice in the Amathole region. The Imingcangathelo Community Development Trust (hereafter the 'Trust') was initiated in 2003 between the Imingcangathelo Traditional Authority and the Amathole

Municipality, with support from the Provincial Department of Economic Development and Environmental Affairs. After the Amathole District Municipality (ADM) stated concern about the unsustainable utilisation of natural resources in 2003, it was decided to initiate a medicinal plant cultivation project in the district. The Trust identified tracts of suitable land within the Imingcangathelo Traditional Authority's communal property and started cultivating medicinal plants – including *P. sidoides*. Harvesters within the Imingcangathelo Clan who are interested in wild collecting may only do so upon obtaining permission from the chairman of the Trust (Chieftainess Tyali, pers. comm., 2009). Parceval Pharmaceuticals became involved in the Trust in early 2008, after being approached by members. This association has led to the initiation of a benefit-sharing agreement between the Trust, Parceval and Schwabe.

In **Lesotho**, the local community council in a given area is responsible for the natural resources within its boundaries. Therefore embarking on natural resource extraction such as harvesting *P. sidoides* may only proceed after a public gathering has been held and an agreement reached between the chiefs of villages wishing to be included in the enterprise and the community council. Once a village has decided to become involved, a committee – the 'khoarra' (*P. sidoides*) committee - is established, which attempts to ensure that sustainable harvesting techniques are employed. The village chief by virtue of his position wields enormous power since he is the one who may put a stop to harvesting in case it is done incorrectly or in the event of cultivation, the chief - after consulting the buyer - will indicate when harvesting should take place.

Other economic opportunities

Economic opportunities are scarce in the **Amathole** region – most of the harvesters surveyed relied on subsistence farming or as Lewu *et al* (2007a) found, were involved in collecting other plants such as *Aloe ferox* to supplement their livelihoods. A few of the members of the Trust had been employed on a part-time basis by the ADM, but clearly these limited opportunities were not substantial enough to contribute to social upliftment in the area.

Many of those involved in harvesting *P. sidoides* in **Lesotho** also engage in collecting rose-hip – an alien plant which grows abundantly along the hedgerows. The rose-hip fruit is used in an herbal tea and is also collected by Bophelo Natural Products.

According to Mr Nieuwoudt, those involved in harvesting both species are assured of a year-round income since *P. sidoides* is mainly collected during the summer months from September to April while the rose-hip season peaks in winter. Other sources of income were listed as: ploughing fields for others, road construction and eco-tourism, but again – as observed in the **Eastern Cape** – none of these endeavours made a significant or sustainable difference to livelihoods.

Awareness

Very few of the harvesters surveyed in either country were aware of the intended use of the plant after commercial harvesting. However, an exception to this is the experience of members of Lokwe village in the **Eastern Cape**. Lokwe is one of the 23 villages belonging to the Imingcangathelo Clan. Members of this village were exposed to the controversies of the *Pelargonium* patents by the ACB, the NGO which has challenged two of the patents held in respect of *P. sidoides* by Schwabe at the EPO. Three members from Lokwe and two from nearby villages have filed affidavits at the EPO in support of the ACB's challenge. In the affidavits the community members, some of whom are herbalists, declare their familiarity with the medicinal properties of *P. sidoides* and preparation methods thereof (EPO, n.d.).

Harvesters in Lokwe expressed their discontent with the price they received from the buyers for raw material, but it is not clear how they sought to remedy this situation in the future since they indicated that they were eager to harvest again. However, members from the Lokwe community were not prepared to join in a partnership with industry as the members of the Trust had. This would mean that in future members of this village would be excluded from the *P. sidoides* industry since - according to new legal requirements for benefit-sharing agreements - a company would only be granted a permit to collect plant material from those communities party to the BSA.

6.4. Volumes of Material Traded

Estimates for the volumes collected from the **Eastern Cape** vary widely. According to a local trader the industry has worked on the basis of 50 tonnes of wet material per annum (Gowar, Gowarenterprises, pers. comm., 2009). This figure corresponds closely to an early study conducted by Newton (In prep.) which concluded that an eight-month harvest season produced between 28 and 45 tonnes of material (wet

weight). Other, more recent estimates, are considerably higher - for example Quintus Hahndiek from Eastern Cape Nature conservation estimated that harvest volumes were closer to 20 tonnes per month or 160 tonnes per yearly harvest season after discovering a stockpile of more than 300 bags of freshly harvested material at a warehouse in Grahamstown in 2007, which according to Mr Hahndiek represented around two weeks' worth of collected material. This figure corresponds with the findings of Lewu *et al* (2007a) which showed that more than 26 tonnes of plant material was collected during a one-month period from 10 settlements in the Amathole region in 2005. Scaled up this suggests annual volumes of 208 tonnes. It should be added however that the probability of *P. reniforme* being mixed in with the total harvest volumes was high (Lewu *et al*, 2007a).

Extrapolating from the information supplied by harvesters during the field work – if harvesters earned between R200 and R700 per month, this would mean they collected between 50 and 175 kilograms each per month. Based on the figure of 317 harvesters active in 2005 in the Alice and Healdtown areas (DEAET, 2005) this translates to tonnages (wet weight) of between 15 and 55 tonnes per month. Taken over an eight-month harvest season (Newton, In prep.) this would mean between 120 and 440 tonnes (wet weight) were harvested per annum in the Eastern Cape. However, this figure could not be verified.

A socio-economic survey conducted by Dold and Sizane (2002) estimates that a harvester could realistically collect approximately 29 kilograms per month. If this figure is applied to the equation above, it means that 317 harvesters would have collected around 9 tonnes per month and an annual volume of 74 tonnes would have been achieved. This more conservative figure is unfortunately impossible to confirm in the absence of firm data regarding harvester numbers and factors such as seasonal variation in harvesting intensity. In summary, the total volume of wet harvested material from the Eastern Cape could have been between 74 and 440 tonnes per annum.

According to the industry only 10 tonnes (dry weight) of *P. sidoides* was exported from **Lesotho** during the period March 2007 to March 2008 (Nieuwoudt, Bophelo, pers. comm., 2009). When adjusting this volume to dry material, the ratio of dry to wet material being 1:3.4 (Newton *et al*, In prep.), 34 tonnes of wet harvested tubers

were collected, but this could not be confirmed. Industry members did not want to make any other figures known (Nieuwoudt, Bophelo, pers. comm., 2009) and the records on file at NES were not available at the time of this research. According to Ms Ntoshi (NES, pers. comm., 2009) these figures would have been identical to those supplied by industry since the government did not keep an independent set of records. However, figures extrapolated from harvester and trader interviews conducted by Newton *et al* (In prep.) present an estimated range of between 26 and 93 tonnes of wet material collected in **Lesotho** per seven-month season.

Again, extrapolating volumes from harvester interviews conducted during this research could not be performed with accuracy since the actual number of harvesters involved in the 2007 season was not known. Based on the figure of a minimum of 63 harvesters from the Tsatsane area (seven villagers from nine villages were trained in harvesting techniques by industry) this translates into total volumes of wet weight between 47 and 71 tonnes per seven-month season. These figures indicate that total volumes of wet material collected in **Lesotho** range between 26 and 93 tonnes per annum – a figure somewhat lower than that of the Eastern Cape.

Since harvesting would have taken place in either the **Eastern Cape** or **Lesotho** – not concurrently (Newton, TRAFFIC, pers. comm. 2009) the final estimate for tonnages of wet material collected in southern Africa ranges from 26 to 440 tonnes. Again, it should be emphasised that these figures were based on incomplete information and could not be authoritatively confirmed.

6.5. Financial Benefits to Communities from Trade in *P. sidoides*

In the **Eastern Cape** collectors were paid between R50 and R100 for a large (maize meal bag) bag of wet harvested *P. sidoides* material. These large bags contain between 20 and 30 kilograms of wet material (Hahndiek, Eastern Cape Nature Conservation, pers. comm., 2009), thus harvesters received between R1.60 and R4.00 per kilogram. However, this price may not be accurate since a source from the former Eastern Cape Provincial Department of Water Affairs and Forestry alleges that the scales used by local buyers in the **Eastern Cape** were tampered with so that harvesters were not being paid the full amount due to them. Unfortunately this information could not be verified. Harvesters reported that material was collected

every fortnight by truck (See **Figure 11,** p 70). In terms of effort, collectors commonly took three to four days to fill a bag; with some harvesters reporting that it could take up to a week to fill a bag. This roughly translates into monthly earnings of between R200 and R700 per collector. Harvesters did not agree on a particular harvesting season – some reported that harvesting continued year-round, whilst others said that the plant died back during the dry winter months and was therefore not collected. However, to facilitate comparison, calculations here are based on the eight-month harvest season as identified by Newton (In prep). Thus, assuming that harvesting occurred throughout an eight-month season (Newton, In prep.), these earnings translate into an annual income of between R1 600 and R5 600 per harvester.

Harvesters in **Lesotho** agreed that the price they received varied between R4.00 and R4.50 per kilogram. However, trying to estimate how much each harvester collected per season was much more difficult. The unit of measure used was a 50 kilogram maize meal bag, but it is unclear how much such a bag full of freshly harvested tubers might weigh. Weighing was done by the buyer on his scale, the villagers do not own their own scales and neither did they keep any records of the volumes sold. Some harvesters reported receiving R40 per bag and in terms of effort filling up a bag may take between one and two days – depending on the abundance of the resource and the strength of the harvester. In terms of total earnings per year (or seven-month season as identified during the focus groups) harvesters reported earning between R4 000 and R6 000 – this would mean an average between R570 to R850 per harvester per month.

A characteristic of the *P. sidoides* trade in both **South Africa** and **Lesotho** is the inflexibility of the pricing structure. Harvesters stated that the price per kilogram of collected material was set by the buyer and that no negotiation process was entered into. The price per kilogram of material was based on the average minimum daily wage of an agricultural worker (Paulsen, 2009). The limited bargaining power of primary producers is a common feature of industries relying on the commercialisation of genetic resources (Wynberg, 2006a) and is also an indication of the lack of power rural communities have when faced with powerful and skilled members of industry.

Although there are a limited amount of other buyers (outside the supply chain described in **Chapter 4**) operational in the *P. sidoides* industry (Newton, In prep.) the harvesters from the focus groups held for this study reported that they only sold to one buyer – namely Gowarenterprises in the **Eastern Cape** and Bophelo Natural products in **Lesotho**. Therefore, the *P. sidoides* industry in the areas where this study was conducted may be seen as monopolistic. This characteristic of the *P. sidoides* trade is illustrated by the fact that harvesters in both countries complained about buyers neglecting to collect material on the agreed dates. This left harvesters with no choice but to wait until the next collection time since the monopoly held by the buyer precluded them from selling to other traders (Newton *et al*, In prep.). Stockpiling material would often mean that it dried out – as is the case in **Lesotho** where dried material fetched a lower price which seems unwarranted since dried material in theory should be 3.4 times as valuable as wet material (Newton *et al*, In Prep.). In the **Eastern Cape** the danger of the tubers becoming rotten was much greater - this damaged material also fetched lower prices.

Figure 11: Collecting harvested material in the Eastern Cape. Source: Q Hahndiek

However, despite the relatively low prices harvesters were paid - representing only 0.7 percent of the price of *P. sidoides* extract when calculated at R4 per kilogram of wet material (See **Table 4**, p 50) and the inflexibility of the price structure, it became evident from the focus groups that the money earned in this way impacted significantly on the lives of harvesters. Many of the harvesters from both nations indicated that harvesting *P. sidoides* was their only source of income since other forms of employment available were mostly temporary in nature and did not involve large numbers of people. The 'cash-injection' provided by harvesting *P. sidoides* was used by collectors in the **Eastern Cape** to buy everyday basics like electricity and maize meal (the staple food) as well as small household items. Likewise in **Lesotho** the money harvesters earned was used to buy necessities such as food; pay school fees and visits to the doctor; while household items, clothing and furniture could also be bought. It was reported that some harvesters could even afford to buy a sheep with their income – a highly prized animal which is valued at approximately R500.

6.6. Non-Financial Benefits from Trade in *P. sidoides*

Although most harvesters reported on the financial benefits gained from becoming involved in the industry, wider non-monetary benefits can also be recognised. One harvester in **Lesotho** indicated that she benefited 'doubly' from the trade since she sold more of her home-made sorghum beer to fellow harvesters on days that they received their payment for collecting material. There was also an indication that general well-being was improved through taking part in the trade since important beneficial activities such as visiting doctors could be carried out. Additionally, the fact that the money derived from *P. sidoides* was spent on school fees and uniforms may represent a way out of generational poverty – as reported in Shackleton *et al* (2008). By investing in the education of their children harvesters could ensure the next generation has more opportunities and potential for diversifying their livelihoods – thereby potentially lowering their vulnerability and reliance on natural resource extraction.

By forming networks and alliances with harvesters from neighbouring villages it was possible to increase social capital beyond immediate family members and fellow villagers, thereby possibly extending their safety net in times of difficulty. Furthermore, by generating an income close to home, harvesters were spared the

risk of migrating in search of economic opportunities – which are limited in the southern African region (Shackleton *et al*, 2008). Not having to leave their community means that vulnerable family members such as orphans and AIDS patients can be cared for better (Shackleton *et al*, 2008) and stronger family and communal ties are forged. Furthermore, the income from harvesting means that reliance on government grants and loans among family members may be reduced (Shackleton *et al*, 2008).

6.7. Cultivation

Many of the harvesters questioned during the focus group sessions expressed their interest in becoming involved in commercial cultivation. However, thus far the cultivation projects initiated in the **Eastern Cape** and **Lesotho** have been limited in scope and number.

One cultivation project has been established in the **Eastern Cape** by members of the Imingcangathelo Trust. On the recommendation of the Trust's agricultural representative, Mr Matakhane, cultivation of *P. sidoides* began in 2007, with plants taken from the wild and planted in prepared fields. The fields were ploughed with a tractor loaned from the Amathole District Municipality, which also supplied fuel on three occasions. Of the 23 villages in the Imingcangathelo Traditional Authority's territory, 38 people have been identified for cultivation work. Those involved in cultivation were not paid, but joined in the hope that they would be compensated one day when the crop was sold. The Trust also envisions that the money earned from the cultivated plants would be saved in a high interest bearing account, and that the cultivators would be paid a regular wage from the interest earned. The price per kilogram had not been finalised at the time of the field site visit, but Mr Matakhane stressed that they were not interested in simply selling the material, but would rather establish partnerships with industry, so that 'if things go wrong – they (industry) will be able to help them out.' At the time of the site visit, four fields of approximately 2 hectares each had been prepared and partially planted with *P. sidoides* seedlings. A significant number of seedlings were donated by Parceval in November 2008. The plants are intercropped with vegetables such as pumpkins which serve as sustenance for the cultivators.

There has been very limited cultivation undertaken in **Lesotho**. Following training by Bophelo Natural Products, harvesters in the study areas started replanting in the wild as they harvested, although it is unclear whether this would result in successful re-sprouting in the absence of irrigation. Herman Nieuwoudt from Bophelo added that his company was encouraging harvesters to cultivate the plant in their home gardens since he envisioned a time when wild harvesting may be prohibited and sourcing from these home gardens would be necessary. It was clear from observation that villagers in Ha-Thlaku were heeding this advice since there were several patches of cultivated *P. sidoides* amongst the houses in the village. Mr Nieuwoudt, through Bophelo, initiated a small cultivation project – encompassing 2.3 hectares – at a local orphanage in Mohale's Hoek in May 2009. The company rents the land from the orphanage and employs two people full-time, thereby contributing somewhat to the local economy.

6.8. Benefit-Sharing Agreements

The government of South Africa is in the process of implementing the Regulations on Bioprospecting, Access and Benefit-Sharing which were promulgated in terms of the National Environmental Management Biodiversity Act (NEMBA) in 2008. Deputy Director of Resource Economics of the former Department of Environmental Affairs and Economics, Carina Malherbe, explains that 28 permit applications had been received and were being reviewed. One of the agreements under review had been concluded between Parceval – jointly with Schwabe - and the Imingcangathelo Community Development Trust in the Eastern Cape Province.

The reasoning behind implementing benefit-sharing agreements is to ensure that some of the benefit derived from a resource is returned to South Africa. There are three objectives linked to these agreements. The first is the upliftment of the rural poor. Secondly, conservation of the species is also important. Therefore, whilst the utilisation of natural resources is encouraged, it should be carried out in a sustainable fashion. Finally, it is hoped that transfer of knowledge and technology will take place (Malherbe, DEAT, pers. comm., 2009).

According to Malherbe (DEAT, pers. comm., 2009), the national department intended to publish the benefit-sharing agreement concluded between Parceval, Schwabe and

the Trust for public comment after the parties involved had indicated which information was sensitive and thus not available for public scrutiny. This procedure is provided for in section 17(3)c of the Regulations on Bioprospecting, Access and Benefit-Sharing. The document will be published for 30 days in the Government Gazette and a national newspaper. The comments received might then influence the Minister's decision. This precautionary approach was taken because the national department wanted to make the best possible decision since this would be the first case of its kind in South Africa.

Without revealing specific information contained in the agreement, Malherbe (DEAT, pers. comm., 2009) points out that the anticipated benefit to the community has attracted the most attention. Whilst there **are** benefits accruing to the communities, these are not as substantial as perhaps anticipated. This has left a number of community members somewhat disappointed, whilst certain community activists have been 'devastated.'

As for the administration of royalties and other funds earmarked for communities, the department has decided to make use of a 'suspense account' rather than a Trust Fund account. Since a Trust Fund is subject to high administration fees and requires strict procedures to be followed, it was decided that funds would more easily be disbursed through a transmission-type account. The suspense account will be administered by the Director-General of the Department. Communities would then receive the full amount due to them since a suspense account does not carry any administration costs. The funds will be paid out according to the terms stipulated in the BSA, for example in the case of the agreement between the Imingcangathelo Trust and Parceval, the funds would be paid directly into the account held by the Imingcangathelo Trust. If there should be an unallocated amount in the suspense account; it would be disbursed at the Director-General's discretion as set out in Section 19(6) of the Regulations. The account will be used by the national department as a monitoring tool. If permit holders should default on a payment, the account would provide proof which could be used to force permit holders to do so (Malherbe, DEAT, pers. comm., 2009).

In accordance with the government of **Lesotho**'s commitments to the CBD, any new permits are subject to concluding a benefit-sharing agreement with the communities

involved. In fact, such an agreement was concluded in June 2009 between Bophelo Natural Products, the National Environmental Secretariat (NES) and 24 communities from two districts, namely Quthing and Botha-Bothe. In contrast to the procedure in South Africa, the agreement in Lesotho was first negotiated between the company and NES, whereafter it was circulated to the traditional leaders of the respective communities for their comment and approval. Mr Nieuwoudt claimed that a further two communities had since indicated their interest in becoming involved too. Interestingly, the government of Lesotho has requested that a BSA be concluded by Bophelo for the harvesting of rose-hip too. The motivation behind this, according to Ms Ntoshi (NES, pers. comm., 2009) is not so much concern for the sustainability of the resource (which is alien to the country), but rather unease about the limited amount of money received by harvesters. This is an indication of how BSAs are extending beyond their original purpose of regulating bioprospecting.

6.9. Summary of Findings for South Africa and Lesotho

Table 7: Comparison between findings for South Africa and Lesotho

	South Africa	Lesotho
Price harvesters received (wet weight)	R1.60 ~ R4.00 /kg	R4.00 ~ R4.50/kg
Income per harvester per month from *P. sidoides*	R200 ~ R700	R570 ~ R850
Income per harvester per year from *P. sidoides*	R1 600 ~ R5 600 (8-month season)	R4 000 ~ R6 000 (7-month season)
Government old-age pension per month	R940	R200
Child-care grant per month	R240	Donations for food and school fees for orphans
Other sources of income	Part-time agricultural labour for municipality	Road construction; rose-hip harvesting; tourism; ploughing for others
Average daily wage – unskilled worker or farm labourer	R27/day (2001) R47/day (2008)	R34/day (2005)

Average monthly wage – unskilled worker or farm labourer	R513 (2001) R893 (2008)	R653 (2005)
Volumes of *P. sidoides* traded per annum Wet weight	74 ~ 440 tonnes	26 ~ 93 tonnes
Volumes of *P. sidoides* traded per annum Dry weight (1 kg dry=3.4 kg wet)	21 ~ 129 tonnes	7.6 ~ 27 tonnes
Benefit-Sharing Agreement	Negotiated between industry and community (Trust), then sent for national government's approval Being published for comment	Negotiated between industry and government first, then sent to communities for their approval BSA required for rose-hip collection too
Cultivation projects	Four fields cleared in preparation; around 4 to 5 hectares planted since 2007; seedlings donated by Parceval in 2008	No major projects yet, 2.3 hectares planted at an orphanage near Mohale's Hoek in 2009
Level of organisation for the *P. sidoides* trade	Only example of community level organisation identified was the Trust, but there may be other structures	Khoarra committees are established to monitor harvesting techniques
Local medicinal uses of *P. sidoides*	<u>Imincangathelo Trust:</u> 'Cleaning the stomach' – adults, children and animals <u>Lokwe village</u>: Asthma and coughing; stomach complaints; 'drop' in men (gonorrhoea) <u>Preparation method</u> Crush tuber, boil in water, strain and drink Often mix *P. sidoides* and *P. reniforme* – believed to be more potent	Stomach complaints in humans and animals; boost immune system of a weak or fatigued person; shortening menstrual period <u>Preparation method</u> Crush tuber, boil in water, strain and drink, or Grind the dried tuber into a powder and take a pinch

The comparative findings in **Table 7,** p75 illustrate a picture of the experiences harvesters in southern Africa encountered during their involvement in the *P. sidoides* trade. It appears that the experiences of harvesters are similar in both countries – which may be attributed to the fact that harvesters were involved with members of industry linked to the same supply chain as well as the similarity of the socio-economic circumstances in both regions.

The following chapter – **Chapter 7: Assessment and Discussion** – discusses the relevance of these findings and addresses the objectives of this research. The first section of this chapter outlines the experiences of harvesters in relation to access theory – a framework which is employed in order to understand how benefits from genetic resource commercialisation are distributed. The second section looks at the contribution of commercial cultivation projects to rural livelihoods. Finally, the last objective of this study is addressed by approaching the *Pelargonium* industry from the perspective of the FairWild Standards – internationally developed standards which measure the levels of social and ecological responsibility of industries based on wild collected species.

CHAPTER 7: ASSESSMENT and DISCUSSION

7.1. Access and benefits from trade in the *P. sidoides* industry

The benefits which arise along different stages in the lifecycle of the commercialisation of *P. sidoides* are identified in this section. By examining the monetary as well as non-monetary benefits which result from the international *P. sidoides* trade, the pattern of distribution of these benefits will be discerned. The examination of these distribution patterns by means of access theory as proposed by Ribot and Peluso (2003) facilitates the identification of the factors by which individuals or groups in the *P. sidoides* industry enhance their ability to benefit from this resource. The identification of these factors is useful for pointing out those areas which may have to be strengthened in order for rural communities to receive a fairer portion of the gains derived from the commercialisation of genetic and biological resources.

Direct access

The harvesters from the villages visited during this research are able to participate freely in the extraction phase of *P. sidoides* since they have direct access to one of the most important natural assets required for genetic resource extraction, namely access to land (Ribot and Peluso, 2003; Kepe, 2008). Through the system of communal tenure harvesters are allowed to access the land where the resource grows and thereby their physical access to the flora contained within that land (i.e. *P. sidoides*) is facilitated.

However, access to communal land is not 'open' to harvesters, but rather controlled by traditional authorities such as community councils and chiefs. Although this research showed that harvesters joined the trade voluntarily, this freedom may be curtailed in future if for example, too many people are interested in becoming involved and traditional leaders then have to select those who will take part. This selection process is likely to be based on elements of social identity such as family ties or networks based on affiliation which may result in the exclusion of those who do not have strong links with those in authority (Ribot and Peluso, 2003). Another scenario which can already be observed (in the Eastern Cape) is the exclusion of some who have harvested historically due to new legislative arrangements such as

the requirement for BSAs. DEAT state that these agreements cannot be concluded with every community which may be interested in harvesting since it is industry's right to conclude such arrangements with whom they wish and industry members cannot be forced to conclude such an agreement with all communities (Malherbe, DEAT, pers. comm., 2009).

The extraction phase

During the extraction phase, harvesters who otherwise would have had very little opportunity to earn an income, benefited from the financial contribution to their livelihoods. The money earned – estimated between R200.00 and R850.00 per harvester per month – was used to pay for important essentials. However, considering that the price harvesters were paid per kilogram of wet tubers constitutes less than one percent of the final price fetched by *Pelargonium*-based products, brings the fairness of this price into question.

The stakeholder who stands to benefit the most from the extraction phase is the local buyer, who may have expenses such as transportation, storage and staff, but through links with other members of the supply chain, the local buyer is ensured of an all-important aspect of indirect access (Ribot and Peluso, 2003) – access to markets. By controlling the access to exchange relations the local buyer effectively precludes harvesters from forging bonds with processors and exporters directly.

Ironically, the high levels of unemployment in both the Eastern Cape and Lesotho (GPN, 2006; Stats SA, 2009) mean that rural communities in those areas possess high levels of human capital in the form of a labour force which may be readily deployed. However, with disturbing statistics such as the high levels of HIV in Lesotho (GPN, 2006) and advanced ages of some of the harvesters in the Eastern Cape (DEAET, 2005), the justness of employing such vulnerable members of society gives reason for concern. Nevertheless, harvesters who may not have access to property, markets or capital may still gain access to the resource by working for themselves and thereby earning an income which may be a priority in economically depressed areas.

The product transformation phase

During the product transformation phase, for example processing, harvesters typically benefit less than they do in the extraction phase. Reportedly very basic cleaning of raw material occurs in the Eastern Cape before the tubers are transported for further processing in the Western Cape. The processing facilities of Bophelo and BZH require financial assets to purchase equipment, physical assets such as electricity to run the machines and human capital in the form of workers skilled in operating and maintaining the equipment. Practically all of these assets are unattainable for harvester communities – especially in rural Lesotho where only 1.7 percent of households are connected to electricity (Lawson, 2007). The processing facilities provide economic opportunities for a limited amount of semi-skilled workers – four at Bophelo and eleven at full production at BZH. The processors themselves benefit financially to a certain degree but are precluded from scaling up their facilities to GMP standards due to the prohibitive costs involved (Paulsen, BZH, pers. comm., 2009). Achieving GMP certification would mean that facilities could carry out far more sophisticated processing techniques and presumably employ more workers, but since the processing facility located at Parceval has already attained this standard and still does not export the product in tincture form to Schwabe, this may mean that the German company would prefer to process material within their own facilities and to their own specifications. In all likelihood, this is also where the greatest profit lies.

The governments of South Africa and Lesotho may have little opportunity to benefit from the extraction phase since permits for wild collecting are issued free of charge (Bam, DEDEA, pers. comm., 2009), but during product transformation the two governments are able to collect revenue through company taxes. Government officials responsible for issuing permits play a powerful role in regulating access to resources and therefore benefit realisation. As Ribot and Peluso (2003) suggest, opportunities for claiming access to resources exists through extra-legal means such as corruption. Even though no evidence of such activity was found during this research, the possibility that events such as bribery may occur is plausible.

The exchange phase

In the *P. sidoides* industry the exchange phase of the product life-cycle is characterised by a limited number of traders with a strong monopolistic hold over market access. Members of the *P. sidoides* industry strongly embody the factors of market entry as defined in Ribot and Peluso's 'Theory of access' – namely access to capital, numbers of buyers, exclusionary practises and acts of collusion (Polanyi, 1944; Hecht and Cockburn, 1989; Shipton and Goheen 1992; Nelson 1995; Feder, 1996, cited in Ribot and Peluso, 2003). First of all the ultimate buyer in the supply chain, Schwabe, as a well-established multinational corporation has ready access to capital – as evidenced by their willingness to sponsor a research assessment for the resource (for the amount of R250 000); a benefit-sharing workshop; a publication about benefit sharing as well as financial contributions to a number of community projects. Secondly, the number of buyers in the supply chain is low – a factor which enhances market entry for those involved whilst simultaneously excluding other traders. The possibility that market access is gained and maintained through exclusionary practises and acts of collusion exists, but was however not studied during this research.

Transportation and distribution

The transportation and distribution phases of the *P. sidoides* product life-cycle do not contribute in any way to the livelihoods of rural harvesters. Basically, the critical shortage of financial capital in such communities directly impacts on their ability to enhance physical capital. Access to these phases could possibly be achieved through access to credit, but again this is unlikely since credit is normally only extended to those who have sufficient capital initially (Ribot and Peluso, 2003). This means that for rural communities to make the 'leap' from being primary producers to the next step on the supply chain – transporters – is a near impossible task. Distribution of the final product from manufacturing facilities in Germany and elsewhere is presumably undertaken by large private companies, out of reach of rural communities.

The consumption phase

The consumer of *Pelargonium*-based cold-care products in the United States, Germany or elsewhere benefits from using a product which is safe, effective, freely available and presents few side effects (Brendler and van Wyk, 2008). At this point in

the lifecycle all financial benefits accrue to Schwabe and the pharmacies or health stores which sell their products. Of course, the €80 Million that Schwabe reportedly made from the sales of Umckaloabo in Germany in 2008 is not an indication of the company's profit, but the success of the product does show that the patents held by the company over extraction methods seem to be acting in the company's favour.

Benefit distribution

This discussion has sought to identify the benefits which are generated by the trade in *P. sidoides*. As suggested by Ribot and Peluso (2003) it is theoretically possible to have the rights to benefit from land but without indirect elements of access such as labour, technology, capital, markets or knowledge the possibility exists that no benefits may be realised. The results from this research show that harvesters – although they have access to land and labour – still derive a restricted amount of benefits from the *P. sidoides* trade. By observing the considerable amount of benefits which accrue to the company at the other end of the benefit chain – Schwabe – the deficiencies in elements of indirect access held by harvesters are highlighted.

The most significant factor in Schwabe's favour is the company's access to capital. Having abundant stocks of financial assets translates into an elevated level of power which allows the company to participate in the benefit streams of production, extraction and conversion to a greater degree. Furthermore, having financial capital means that the company can use technology to its advantage by increasing participation in production phases such as cultivation. Schwabe has already demonstrated this by investing in commercial cultivation projects in Mexico and Kenya (ACB, 2008a; Feiter, Parceval, pers. comm., 2009). A second asset which is important to Schwabe is access to knowledge. Knowledge about business practises, technology and legal procedures is a powerful tool with which market relations can be controlled. The possibility of producers being kept reliant on companies exists if those who have the technical knowledge refuse to share their expertise and information (Ribot and Peluso, 2003).

Therefore, if Schwabe is in possession of vast stores of financial capital and knowledge it can be deduced that harvesters lack these two assets, which judging from the results of this research appears to be true. Consequently, if the governments and concerned NGOs of South Africa and Lesotho are to bring about a

difference in the lives of harvesters living in poverty, strategies that enhance the twin capitals of finance and knowledge should be devised first.

7.2. The contribution of cultivation to rural livelihoods

The second objective of this research was to examine the potential contribution of commercial cultivation of *P. sidoides* to rural livelihoods along with investigating the role cultivation projects play in long-term partnerships between industry and communities. Several stakeholders in the *P. sidoides* industry have become involved in commercial cultivation projects, many harvesters expressed interest in becoming involved and certain authors recommend it as a way of conserving wild stocks of the resource (White *et al*, 2008; Lewu *et al*, 2006). Yet, the benefits of cultivation are most likely to be concentrated in the hands of the social elite (Homer-Dixon *et al*, 1993) or those members of a community who have close ties with the social elite - which means that harvesters without the necessary level of social assets are at risk of being excluded. Moreover, where wild harvesting potentially employs hundreds of community members, commercial cultivation would require less manpower.

In the case of the Trust in the Eastern Cape, it appears that those who have close ties to the chieftainess are the ones who set about establishing the Trust and consequently initiated the cultivation projects. It also became apparent that the villagers who were selected to partake in cultivation were in some way connected to members of the Trust – either via family networks or through other social relations such as friendship (Mr Matakhane, Imincangathelo Trust, pers. comm., 2009) These findings correspond with Ribot and Peluso's (2003) theory of access which holds that land use changes are often accompanied by a process of beneficiary selection based on social identity (Menzies, 1988; Thomson, 1991, cited in Ribot and Peluso, 2003).

Commercial cultivation potentially provides advantages to the industry by guaranteeing a regular supply of material which is more uniform and subject to higher levels of quality control (Schippmann *et al*, 2002). Of course, by establishing long-term projects of this kind both industry and community members stand to benefit by increasing the levels of trust between them (Ribot and Peluso, 2003). On the one hand cultivators know that the market for their product is guaranteed while

traders on the other hand are assured of a steady supply of the genetic resource.

However, this production phase of the *P. sidoides* lifecycle is associated with capital investments in water supplies, seedlings and farming equipment which are beyond the reach of most communities and will therefore have to be financed by industry in the absence of government subsidies (Feiter, Parceval, pers. comm., 2009). Industry may also be required to invest human capital in projects in the form of skills and knowledge transfer. The relatively limited amount of commercial cultivation initiated by industry in southern Africa may be an indication of economic factors at play. It is known that obtaining wild-harvested material from southern Africa is cheaper than cultivating (Feiter, Parceval, pers. comm., 2009) and it is plausible that in the event of wild stocks becoming depleted, industry would acquire their material from other, more economical sources. This may in fact be the reason why cultivation projects have already been established in countries like Kenya and Mexico where labour costs are relatively low and transportation costs to Europe and America would be considerably reduced.

7.3. Preliminary assessment of the *P. sidoides* industry according to the FairWild Standards

Companies involved in the commercialisation of natural resources who wish to remain competitive in the global marketplace may have to increase their level of accountability in order to attract customers and business partners (FairWild, 2009). This may be accomplished by joining an eco-labelling scheme or qualifying for certification by an internationally recognised standard. The FairWild Standards are suitable for assessing an industry mainly based on the wild collection of natural resources – such as the *P. sidoides* trade. These standards are particularly useful for the medicinal plant trade which does not readily fit into the Fair Trade Model. Being based on Fair Trade principles as well as International Labour Organisation (ILO) standards, the FairWild Standards allow for sound integration of social aspects along with the economical and ecological segments of responsible trade in genetic resources. Due to the integration of these principles, the FairWild Standards contain more comprehensive criteria regarding workers' rights than is required by the ISSC-MAP (FairWild Standards, 2006). Furthermore, any operation aiming to become FairWild certified is expected to comply with Principle 4 of the ISSC-MAP, namely

'Respecting Customary Rights and Benefit-sharing'.

The following exercise is purely an experimental attempt at assessing whether the *P. sidoides* industry would 'qualify' for FairWild Certification or not. Since a number of the criteria were not addressed during the research and/or are not relevant, this assessment is not complete. Those criteria which were not covered during the interviews and focus groups have been omitted. Since the trade in *P. sidoides* from southern Africa is almost exclusively controlled by the 'Schwabe supply chain' described earlier (see **Chapter 4**) – the 'company' in the context of this assessment is Schwabe and its main southern African suppliers, namely Parceval, BZH, Bophelo Natural Products and Gowarenterprises. Unless indicated differently, all responses are for both South Africa and Lesotho. A copy of the FairWild Standards in their entirety can be found in **Appendix 5**.

THE FAIRWILD STANDARDS

SECTION I: RELATION BETWEEN COLLECTORS AND COLLECTION COMPANY

Principle 1: Fair Contractual Relationship between Company and Collectors

This principle strives for a fair and transparent economic relationship between collectors and the collection company and ensures that collectors have organisational structures in place which serve to represent and defend their interests.

In Lesotho, harvesters were historically not informed of quantity restrictions by the company and complained that the collector sometimes did not return to collect harvested material – claiming that he had too much in stock. On other occasions the collector did not have enough cash to pay harvesters for all their material – indicating that no regular upper limit for volumes was set.

The establishment of BSAs between industry and communities will almost certainly mean that basic information such as the amount of raw material required by industry

is communicated better. Involvement in BSAs with industry might also mean that future contractual relationships are based on long-term and fair conditions which will provide harvesters with more security. Harvester's rights and interests may be best represented through harvester's organisations. Evidence that a certain level of such planning has already been attained exists in both countries. In **Lesotho** organisational structures have already been established in the form of 'khoarra' committees. In the **Eastern Cape** the Imingcangathelo Trust has already reached a high level of organisation, but it is not clear whether this example is repeated elsewhere in the province.

Principle 2: No Discrimination

Principle 2 promotes the registration of women as harvesters and discourages discrimination between social groups.

No sign of discrimination in terms of gender, race or age was noticed in either of the countries. In fact, women made up the majority of the harvester numbers and in one case assumed a leadership role as chairperson of the khoarra committee in Ha-Thlaku village, **Lesotho**.

Principle 3: Child Labour is Avoided

This principle protects the rights of children and stipulates additional safety requirements for young collectors.

In the **Eastern Cape** harvester identification records for the Alice and Healdtown districts in 2005 (DEAET, 2005) indicate that two 15-year-olds were registered, however this seems to be the exception rather than the rule and child labour is generally avoided. This does not mean that children did not perhaps help their parents with harvesting, however this was not assessed.

Principle 4: Respecting Customary Rights

This principle, which originates from the ISSC-MAP Standard, is a prerequisite for wild collection companies aiming for FairWild certification. It strives for the recognition of local communities' and indigenous peoples' customary rights to use and manage collection areas and wild MAP resources. Further, principle 4 promotes the implementation of benefit-

sharing agreements based on adequate knowledge of MAP resource tenure, management requirements and the value of the resource.

This criterion highlights a significant difficulty in the *P. sidoides* trade. Possibly the greatest impediment to the fulfilment of this criterion is the lack of an in-depth ethnobotanical study which records the indigenous uses of this species across its distribution range.

The apparent 'lack' of recorded information regarding the use of *P. sidoides* for ailments associated with the respiratory tract has been interpreted by some members of the industry as evidence of no prior art or traditional knowledge around these uses. This 'misinterpretation' has had far-reaching consequences – from the lodging of patents over the use of extracts from the plant to uncertainty about entering into benefit-sharing schemes since indigenous knowledge about this plant is so widely spread.

It is possible that the inclusion of traditional uses and access rights in the management plan which is in preparation for this species will contribute towards recognising and respecting customary rights. However, at present a real risk exists of undermining availability and accessibility for local use exists if uncontrolled harvesting from the wild persists (Newton *et al*, In prep.).

Progress towards implementing benefit-sharing agreements has been made in each of the countries. What remains unclear is whether these agreements are based on adequate knowledge of the present and future value of the resource since no comprehensive resource assessment has been performed. Regarding the use of traditional knowledge, no evidence of prior informed consent exists, partly because of the long history of use of this plant in conventional medicine which started well before prior informed consent was a requirement for genetic resource extraction. Another factor which precludes this is the difficulty of identifying a particular individual or group as the 'knowledge holder'.

Principle 5: FairTrade Benefits the Collector and Their Communities

This principle encourages the use of Fair Trade practices such as minimising trade intermediaries and establishing a Fair Trade premium fund which supports social development.

Until the introduction of BSAs became compulsory, there was a serious lack of transparency regarding the calculation of prices paid to collectors in this industry. Even so, without access to the BSAs it is impossible to say whether this situation has improved. By basing the price per kilogram paid to harvesters on an average agricultural worker's wage (which is notoriously low in South Africa) (Paulsen, 2009) the costing process has no relation to the actual value of the resource. This then means that harvesters did not receive a 'fair' share of the profits. They most certainly did not receive a higher price in accordance with FairTrade principles which allow for extra compensation for wild collectors who do not receive any social benefits and also have to rely on an uncertain source of income. Furthermore, it was indicated by harvesters that this price was not negotiable, a contravention of their right to fair compensation for their labour.

The supply chain in this industry appears to be rigidly structured, with very little opportunity for competitors to deal with Schwabe, the main buyer, directly. If this were possible, the lower number of intermediaries (as recommended by FairTrade) would be beneficial to collectors who in effect could then receive higher wages since the price would not be artificially inflated at each link in the chain. Additionally, the monopolistic structure of the trade makes competition between buyers almost non-existent – another factor which precludes harvesters from negotiating a better price.

On a positive note, harvesters were paid in a convenient way (in cash) and there seems to have been very little delay in paying them. In the future, those involved in BSAs with industry would benefit from an additional amount being paid into their trust account by industry. This could in effect function like a FairTrade premium which could accumulate in the trust fund and be distributed according to the inclination of the fund committee members or local traditional leaders.

SECTION II: FAIR LABOUR CONDITIONS FOR WORKERS

Principle 6: Fundamental Principles and Rights at Work are Respected
Principle 7: The Company is a Socially Responsible Employer and Provides Good Working Conditions
This section pertains to workers of certified companies such as those employed in processing facilities and therefore is not related to this study.

SECTION III: FAIRTRADE OBLIGATIONS OF WILD COLLECTION COMPANIES TOWARDS BUYERS

Principle 8: Wild Collection Companies Strive For Fair and Quality Conscious Trade Behaviour
This principle encourages clear and transparent trade agreements between wild collection companies and buyers. It also promotes the improvement of quality standards.

In terms of working towards improving quality standards, efforts were made by intermediary buyers in both South Africa and Lesotho.

SECTION IV: FAIRTRADE OBLIGATIONS OF BUYERS TOWARDS THEIR WILD COLLECTION PRODUCT SUPPLIERS

Principle 9: FairTrade Practices
This principle, in accordance with Fair Trade practises, promotes long-term trade relationships which are mutually beneficial and based on respect and transparency.

As far as the relationship between the importer Schwabe and local companies is concerned, there appears to be a healthy long-term and mutually beneficial agreement with erstwhile subsidiary Parceval; but very little flexibility is observed towards other potential suppliers. Some members of the supply chain expressed their concern over this inflexible arrangement which effectively precludes them from dealing with Schwabe directly. The company Schwabe would have to increase its

levels of transparency in order to be considered compliant with the criterion for 'Transparent Trade Agreements' in section 9.2. The difficulty in obtaining sound data regarding volumes of *P. sidoides* material traded and numbers of harvesters involved in the industry for this study demonstrates the company's current unwillingness to share such information in a transparent manner.

Principle 10: Fair Prices and FairTrade Premium

This principle strives for prices to be paid to collectors which are based on individual cost calculations and slightly higher than those paid on the conventional market. Additionally, apart from the agreed fair price, a Fair Trade premium is paid by the buyer into the collector's fund which will then be used for social development of collector communities.

This aspect may be addressed through royalty payments or other 'premiums' as decided by the BSAs concluded in both countries (see Principle 5 above), but it is premature to draw conclusions in this regard.

Summary

By considering the 'performance' of the *P. sidoides* industry according to FairWild Standards, it is clear that a number of issues would have to be addressed before compliance with the Standards would be possible. The conclusion of BSAs between communities and industry may bring about several positive changes to the historical situation within the industry. Some examples - as illustrated above are: more transparent and secure relationships between collectors and collection companies; a 'premium' paid into communities' trust funds which could be used for social upliftment of the broader community; and the opportunity for communities to negotiate better terms with industry.

However, it should be remembered that not all of those who may be interested in harvesting *P. sidoides* will be able to conclude BSAs, since government cannot and will not 'force' industry to conclude such agreements with every community which wishes to become involved (Malherbe, DEAT, pers. comm., 2009). Furthermore, the question of whether BSAs will in reality change the status of harvesters or contribute to levels of social justice within the industry remains to be answered.

This study has affirmed findings by Arnold and Ruiz- Peréz (2001) which predicts that in the case of growing markets, the poorest sectors with low levels of human, physical and financial capital risk being 'muscled-out' by others with more power and wealth at their disposal. This was demonstrated in the Eastern Cape where those affiliated with the Trust have been included in partnerships with industry as prescribed by new legislative measures while others, such as the villagers from Lokwe – through their decision not to engage in partnerships with industry (possibly as a result of awareness-raising by the ACB) have been excluded and would have to seek special permission from the members of the Trust to become involved in harvesting again (Tyali, Imincangathelo Clan, pers. comm. 2009).

Despite the (limited) benefits which accrue to harvesters during the lifecycle of the *P. sidoides* industry the danger remains that engaging in the trade of this resource may constitute a 'poverty trap' - partly because it precludes participants from exploring other opportunities (Neumann and Hirsch, 2000). If harvesters in the *P. sidoides* industry are not empowered through interventions which increase their levels of human and physical capital concurrently with financial capital, they are destined to remain poor and disenfranchised.

The next chapter, **Chapter 8**, concludes this thesis by readdressing the main findings of this study.

CHAPTER 8: CONCLUSION

This research has examined the international trade in *P. sidoides*. The main aim of this study was to trace and understand how benefits are realised and distributed along the supply chain of *P. sidoides* material for the international market. It was found that, like many industries based on the extraction of genetic resources from southern biodiversity-rich nations, the *P. sidoides* industry shows elements of unequal benefit distribution.

The first objective of this study related to identifying the benefits which arise along the *P. sidoides* supply chain. By investigating the benefits which arise throughout the lifecycle of *P. sidoides*-based products from extraction to consumption, and analysing the benefit distribution according to access theory - it was noted that impoverished rural communities which rely on harvesting to supplement their limited livelihoods have the opportunity to benefit during the initial extraction phase. However, the financial benefits gained by harvesters within this phase are minor when compared to the final value of the resource at the consumption level – which is indicative of the low levels of distributive justice in the industry.

On the other side of the lifecycle is a multinational corporation which markets products prepared from *P. sidoides*. This powerful entity embodies everything the poor rural collectors from the Eastern Cape and Lesotho do not: vast reserves of financial, physical and human capital. Even though the harvesters may be the custodians of the lands where the resource naturally occurs, this access does not translate into an equitable share of benefits for them since, along every step in the product lifecycle the more powerful company dictates the way forward.

The second objective of this study was an examination of the value of commercial cultivation of the resource to rural livelihoods. It was found that commercial cultivation of *P. sidoides* was limited in southern Africa. Harvesters indicated their willingness to engage in cultivation projects – seeing it as a possible sustainable source of income. Further, certain government officials were in support of commercial cultivation, especially in the light of unsustainable wild harvesting practises. However, industry members were less willing to become involved in setting up such projects, citing high input costs as the main deterrent. Although a small

number of cultivation projects have been established in tandem with rural communities, it seems unlikely that the industry is interested in pursuing commercial growing on a large scale within southern Africa.

The final objective of this research concerned a preliminary assessment of the *P. sidoides* industry according to the FairWild Standards. This assessment pointed out that the industry would have to address a number of issues in order to be viewed as socially and ecologically responsible. Some of these issues are identified as the lack of transparency within the industry, the restricted negotiating power of harvesters and the limited benefits accruing to harvesters of the resource.

Relying on the commercialisation of genetic resources has been shown to contribute to rural livelihoods – particularly for the poorest members of rural societies. Yet without the relevant assets at their disposal to negotiate better remuneration for their efforts and establish fairer partnerships with other members of the supply chain, the fate of the most vulnerable members of rural harvester communities remains sealed.

There appears to be two main factors obstructing social justice in the *P. sidoides* industry. First of all, the uneven relationship which exists between the sophisticated multinational company on the one hand and undeveloped, impoverished rural harvester communities on the other, allows for a myriad of opportunities where wealth and power may overshadow agreements and partnerships. Secondly, on a community level, the most marginalised members of harvester communities with the smallest amount of social capital are likely to be excluded from trade activities by members of the social elite within their own communities.

The main conclusion of this thesis, therefore, is that the *Pelargonium* trade epitomises many of the historical and existing inequities in biodiversity trade, and that without access to financial capital, technological assets and knowledge of business practises, nothing will change for communities.

REFERENCES

ACB, 2007. Bioprospecting, Biopiracy and Indigenous Knowledge – Two Case Studies from the Eastern Cape Province, South Africa. African Centre for Biosafety.

ACB, 2008a, Knowledge Not for Sale – Umckaloabo and the *Pelargonium* Patent Challenges. A Briefing Paper by the African Centre for Biosafety.

ACB, 2008b Frequently Asked Questions on the Pelargonium Patent Challenges. African Centre for Biosafety, August 2008.

Afolayan, A.J. and Masika, P.J. 2004. Assessment and Sustainable Harvesting of *Pelargonium sidoides* in the Eastern Cape. A Feasibility Study Carried out by The University of Fort Hare.

Aneki, 2009. The Source for World Rankings. Available from: http://www.aneki.com/ [Accessed 17 July 2009].

Arnold, J.E.M. and Ruiz-Pérez, M. 2001. Can Non-Timber Forest Products Match Tropical Forest Conservation and Development Objectives? *Ecological Economics* 39 (3) 437-447.

Bladt, S., 1974. *Zur Chemie der Inhaltsstoffe der Pelargonium reniforme Curt. – Wurzel* (Umckaloabo). PhD Thesis, University of Munich.

Bladt, S. and Wagner, H. 2007. From the Zulu Medicine to the European Phytomedicine Umckaloabo. *Phytomedicine*, 14 (SV1) 2-4.

Bodeker, G. 2007. Traditional Medicinal Knowledge and Twenty-first Century Healthcare: The Interface between Indigenous and Modern Science, in Sillitoe, P. (ed.) *Local Science vs Global Science – Approaches to Indigenous Knowledge in International Development*. New York, Berghahn Books.

Brechin, S.R., Wilshusen, P.R., Fortwangler, C.L. and West, P.C. 2002. Beyond the Square Wheel: Toward a More Comprehensive Understanding of Biodiversity Conservation as Social and Political Process. *Society and Natural Resources*, 15, 41-64.

Brendler, T. and van Wyk, B.E. 2008. A Historical, Scientific and Commercial Perspective on the Medicinal Use of *Pelargonium sidoides* (Geraniaceae). *Journal of Ethnopharmacology* 119, 420–433.

British Medical Association, 1909. Secret Remedies – What They Cost and What They Contain. London, British Medical Association.

Cape Province, 1974. Nature and Environmental Conservation Ordinance (Ordinance No. 19 of 1974).

Carney, D. (ed.) 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* London: Department for International Development.

CBD, 2002. Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of Their Utilisation. Decision VI/24, 2002, Convention on Biological Diversity. Available from: http://www.biodiv.org-/doc/publications/cbd-bonn-gdls-en.pdf [Accessed 25 March 2009].

Chakela, Q.K. (ed.) 1999. State of the Environment in Lesotho 1997, National Environment Secretariat, Ministry of Environment, Gender and Youth Affairs.

Chambers, R. 1983. *Rural Development: Putting the Last First*. Harlow, Longman.

Cocks, M.L. and Dold, A.P. 2000. *The Medicinal Plant Trade in the Eastern Cape*. Prepared for the Department of Water Affairs and Forestry. Grahamstown, Rhodes University.

Cousins, B. 1999. Invisible Capital: The Contribution of Communal Rangelands to Rural Livelihoods in South Africa. *Development Southern Africa* 16 (2) 299-318.

Cramme, O. and Diamond, P. 2009. Introduction: Rethinking Social Justice in the Global Age, in Cramme, O. and Diamond, P. (eds.) *Social Justice in the Global Age*. Cambridge, Polity Press, 3-22.

DEAET, 2005. Department of Economic Affairs, Environment and Tourism. Environmental Affairs: Amatole Region. Permit No: CR47/11/05. 22 November 2005.

DEAT, 1997. Department of Environmental Affairs and Tourism. White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity. *Government Gazette* Notice 1095 of 1997, Vol. 385, No. 18163. Available from: http://www.polity.org.za/govdocs/white_papers/diversity.html [Accessed 25 May 2009].

Dold, A.P. 2009. Traditional Use of *Pelargonium sidoides* in the Eastern Cape. TESA/SANBI Workshop: Management Plant for *Pelargonium sidoides*, Grahamstown, 3 February.

Dold, A.P. and Cocks, M.L. 2002. The Trade in Medicinal Plants in the Eastern Cape Province, South Africa. *South African Journal of Science* 98, November/December.

Dold, A.P. and Sizane, N. 2002. Unpublished Results of a Socio-Economic Survey Conducted in the Peddie and Alice Districts of the Eastern Cape Province, 29 August to 5 September 2002. Grahamstown, Botany Department, Rhodes University.

EED, 2008. Rural Community of South Africa Stands up Against *Pelargonium*-Patents and Biopiracy. *EED News* 7 May, Church Development Service. Available from: http://www.eed.de/enen/-en.eed/en.eed.news/en.news.25/index.html [Accessed 8 July 2009].

EPO, n.d. European Patent Office. Available from: http://www.epo.org/ [Accessed 24 June 2009].

FairWild, 2009. FairWild Foundation. Available from: http://www.fairwild.org [Accessed 12 July 2009].

FairWild Standards, 2006. Version 1 (11/2006). Swiss Import Promotion Programme, Forum Essenzia and Institute for Market Ecology. Available from: http://www.-forum-essenzia.org/PDFs/FairWild-Standards.pdf [Accessed: 10 July 2009].

Feder, B.J. 1996. In a Quirky Market for Milk, Consumers and Farmers Lose. *New York Times*, November 30 1996, New York.

FHISER, 2006. Rapid Eastern Cape Provincial Assessment of Service Delivery and Socio-Economic Survey. The Fort Hare Institute of Social and Economic Research, University of Fort Hare and Development Research Africa.

Geographical Dictionary, n.d. Available from: http://www.answers.com/topic/natural-resource [Accessed 12 July 2009].

Gepts, P. 2004. Who Owns Biodiversity, and How Should the Owners be Compensated? *Plant Physiology*, 134 (4) 1295-1307.

GMP Institute, n.d. A division of ISPE. Available from: http://www.gmp1st.com/gmp.htm [Accessed 23 July 2009].

GPN, 2006. Highlights of Current Labor Market Conditions in Lesotho. Global Policy Network. Available from: http://www.gpn.org/data/lesotho/lesotho-analysis.doc [Accessed 26 July 2009].

Gray, D.E. 2004. *Doing Research in the Real World*. London, Sage Publications.

Grudens-Schuck, N., Allen, B.L. and Larson, K. 2004. Methodology Brief: Focus Group Fundamentals. Iowa State University. Available from: http://www.extension.-iastate.edu/Publications/PM1969B.pdf [Accessed 3 May 2009].

Haidvogl, M. and Heger, M. 2007. Treatment Effect and Safety of EPs 7630-Solution in Acute Bronchitis in Childhood: Report of a Multicentre Observational Study. *Phytomedicine* 14 (SVI) 60–64.

Harvey, W.H. and Sonder O.W. (eds.) 1860. *Flora Capensis, 1*. Dublin, Hodges, Smith and Co.

Hecht, S and Cockburn, A. 1989. *The Fate of the Forest: Developers, Destroyers and Defenders of the Amazon*. London, Verso.

Hirst M. 1990. The Healer's Art: Cape Nguni Diviners in the Township of Grahamstown. PhD Thesis, Grahamstown, Rhodes University.

Homer-Dixon, T., Boutwell, J. and Rathjens, G. 1993. Environmental Change and Violent Conflict. *Scientific American* 268, 38-45.

Hutchings, A., Scott, A.H., Lewis, G., Cunningham, A. 1996. *Zulu Medicinal Plants*. University of Natal Press, Pietermaritzburg.

ISSC-MAP, 2007. International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants Version 1.0. Medicinal Plant Specialist Group, Species Survival Commission, IUCN. BfN Skripten 195.

Karasov, C. 2001. Who Reaps the Benefits of Biodiversity? *Environmental Health Perspectives* 109 (12) 582-587.

Jacot-Guillarmod, A. 1971. Flora of Lesotho. Verlag von J. Cramer.

Kepe, T. 2008. Beyond the Numbers: Understanding the Value of Vegetation to Rural Livelihoods in Africa. *Geoforum* 39, 958–968.

Kitzinger, J. 1995. Qualitative Research: Introducing Focus Groups. *British Medical Journal* 311, 299-302.

Kolodziej, H. and. Kiderlen, A.F. 2007. In Vitro Evaluation of Antibacterial and Immunomodulatory Activities of *Pelargonium reniforme*, *Pelargonium sidoides* and the Related Herbal Drug Preparation EPs 7630*. Phytomedicine* 14 (SVI) 18–26.

Laird, S.A. (ed.) 2002. *Biodiversity and Traditional Knowledge – Equitable Partnerships in Practice*. London, Earthscan.

Laird, S.A. and ten Kate K. 2002. Biodiversity Prospecting: The Commercial Use of Genetic Resources and Best Practice in Benefit-Sharing, in Laird, S.A. (ed.) *Biodiversity and Traditional Knowledge - Equitable Partnerships in Practice.* London, Earthscan, 241-286.

Laird, S. and Wynberg, R. 2003. *Biodiversity Prospecting and Access and Benefit Sharing*. IUCN, Gland, Switzerland and Cambridge, United Kingdom.

Laird, S. and Wynberg, R. 2008. *Access and Benefit Sharing in Practice: Trends in Partnerships across Sectors*. CBD Technical Series No. 38. Secretariat of the Convention on Biological Diversity.

Lawson, D. 2007. A Gendered Analysis of 'Time Poverty' – the Importance of Infrastructure. Development Economics and Public Policy Working Paper Series, Paper No. 21. IDPM, University of Manchester.

Leach, M., Mearns, R. and Scoones, I. 1997. Environmental Entitlements: A Framework for Understanding the Institutional Dynamics of Environmental Change. Discussion Paper No 359. Sussex, Institute for Development Studies.

Letsela, E., Witkowski, T. F. and Balkwill, K. 2003. Plant Resources Used For Subsistence in Tsehlanyane and Bokong in Lesotho. *Economic Botany* 57 (4) 619-639.

Lewu, F.B., Grierson, D.S. and Alfolayan, A.J. 2006. Clonal Propagation of *Pelargonium sidoides*: A Threatened Medicinal Plant of South Africa. *African*

Journal of Biotechnology 5, 123-125.

Lewu, F.B., Adebola, P.O. and Afolayan, A.J. 2007a. Commercial Harvesting of *Pelargonium sidoides* in the Eastern Cape, South Africa: Striking a Balance between Resource Conservation and Rural Livelihoods. *Journal of Arid Environments* 70, 380-388.

Lewu, F.B., Grierson, D.S. and Afolayan, A.J. 2007b. Morphological Diversity among Accessions of *Pelargonium sidoides* DC. in the Eastern Cape, South Africa. *Genetic Resources and Crop Evolution* 54, 1–6.

Macilwain, C. 1998. When Rhetoric Hits Reality in Debate on Bioprospecting, *Nature* 392, 535-541.

Marshall, E., Newton, A.C. and Schreckenberg, K. 2003. Commercialisation of Non-Timber Forest Products: First Steps in Analysing the Factors Influencing Success. *International Forestry Review* 5 (2) 128-137.

Marshall, E., Schreckenberg, K. and Newton, A.C. (eds.) 2006. *Commercialization of Non-Timber Forest Products: Factors Influencing Success - Lessons Learned from Mexico and Bolivia and Policy Implications for Decision-Makers*. UNEP World Conservation Monitoring Centre, Cambridge, UK.

Mativandlela, S.P.N., Lall, N. and Meyer, J.J.M. 2006. Antibacterial, Antifungal and Antitubercular Activity of (the roots of) *Pelargonium reniforme* (CURT) and *Pelargonium sidoides* (DC) (Geraniaceae) Root Extracts. *South African Journal of Botany* 72, 232–237.

Matsiliza, B. and Barker, N.P. 2001. A Preliminary Survey of Plants Used in Traditional Medicine in the Grahamstown area. *South African Journal of Botany* 67, 177–182.

Matthys, H. and Heger, M. 2007. EPs 7630-Solution – An Effective Therapeutic Option in Acute and Exacerbating Bronchitis. *Phytomedicine* 14 (SV1) 65-68.

Matthys, H., Kamin, W., Funk, P. and Heger M. 2007. *Pelargonium sidoides* Preparation (EPs 7630) in the Treatment of Acute Bronchitis in Adults and Children. *Phytomedicine* 14 (SVI) 69–73.

Menzies, N.K. 1988. 300 Years of Taungya: A Study of Long-Term Stability in an Agroforestry System, Human Ecology 16, 361-376.

Merkel, W. 2009. Towards a Renewed Concept of Social Justice, in Cramme, O. and Diamond, P. (eds.) *Social Justice in the Global Age*. Cambridge, Polity Press, 38-60.

Miller, D. 2009. Social Justice versus Global Justice? in Cramme, O. and Diamond, P. (eds.) *Social Justice in the Global Age*. Cambridge, Polity Press, 23-36.

Ministry of Environment and Forests, 2005. Like-Minded Mega-Diverse Countries. Government of India. Available from: http://lmmc.nic.in/ [Accessed 25 June 2009].

Mokuku, C., Lepono, T., Mokhothu, M., Khasipe, T. and Mokuku, T. 2004. Lesotho – Second State of the Environment Report 2002. National Environment Secretariat. Ministry of Tourism, Environment and Culture.

Molele, C. 2009. The Eastern Cape's Poverty Trap. *The Times*, published 10 May. Available from: http://www.thetimes.co.za/PrintArticle.aspx?ID=996138 [Accessed 9 June 2009].

Moore, G. 2004. The Fair Trade Movement: Parameters, Issues and Future Research. *Journal of Business Ethics* 53, 73–86.

Nelson, R. 1995. *Public Lands and Private Rights: The Failure of Scientific Management*. Lanham, MD, Rowman and Littlefield.

Neumann, R. P. and Hirsch, E. 2000. Commercialization of Non-Timber Forest Products: Review and Analysis of Research. Bogor, Indonesia, Centre for International Forestry Research (CIFOR).

Newton, D. In prep. A Preliminary Assessment of South Africa's role in the *Pelargonium sidoides* (DC) and *P. reniforme* (Curtis) Medicinal Plant Trade. Document Prepared for WWF Germany as a Contribution to a Regional Biodiversity Management Plan for *Pelargonium sidoides*, January 2004.

Newton, D. 2009. Current Knowledge on the Status of *Pelargonium sidoides*. TESA/SANBI Workshop: Management Plan for *Pelargonium sidoides*, Grahamstown, 3 February 2009.

Newton, D., Letsela, T., Lijane, T., Mafatle, N., Manyama, P., Naha, S., Ntloko, B., Ntsohi, R., Paetzold, B., Pires, A., Polaki, M., Raimondo, D., Rouget, M., T'sele, T., Wistebaar, N. and Zimudzi, C. In prep. A Non-Detriment Finding for *Pelargonium sidoides* (DC) in The Kingdom of Lesotho. Document Prepared as part of a CITES Scientific Authority Training Programme and a Contribution to a Regional Biodiversity Management Plan for *Pelargonium sidoides*, February 2008.

Ni, K.J. 2009. Legal Aspects of Prior Informed Consent on Access to Genetic Resources: An Analysis of Global Lawmaking and Local Implementation Toward an Optimal Normative Construction. *Vanderbilt Journal of Transnational Law* 42, 227-278.

Nicholls, A. and Opal, C. 2004. *Fair Trade – Market-driven Ethical Consumption*. London, Sage.

Paulsen, K. 2009. TESA/SANBI Workshop: Management Plant for *Pelargonium sidoides*, Grahamstown, 3 February.

Percival, V. and Homer-Dixon, T. 1995. Environmental Scarcity and Violent Conflict: The Case Study of South Africa. University of Toronto, American Association for the Advancement of Science.

Phillips, E.P. 1917. *A Contribution to the Flora of the Leribe Plateau and Environs*.

Annals of the South African Museum 16, 1–379.

Polanyi, K. 1944. *The Great Transformation: The Political and Economic Origins of Our Time*. Boston, Beacon Press.

Prasad, G., Mapetla, M. and Phororo, H. 1993. Edible Wild Plants in Lesotho: An Important Source of Nutrition. Institute of Southern African Studies, National University of Lesotho, Roma.

PROVIDE 2005. A Profile of the Eastern Cape Province: Demographics, poverty, inequality and unemployment. PROVIDE Background Paper Series, 2005:1(2). PROVIDE Project, Elsenburg. Available from: www.elsenburg.com/provide [Accessed 9 June 2009].

Rawls, J. 1971. A Theory of Justice. Cambridge, Harvard University Press.

Redfern, A. and Snedker P. 2002. *Creating Market Opportunities for Small Enterprises: Experiences of the Fair Trade Movement*. Geneva, ILO.

Reid, W.V., Laird, S.A., Meyer, C.A., Gomez, R., Sittenfeld, A., Janzen, D.H., Gollin, M.A. and Juma, C. (eds.) 1993. *Biodiversity Prospecting - Using Genetic Resources for Sustainable Development*. Washington D.C., World Resources Institute.

Republic of Ciskei, 1987. The Nature Conservation Act (Act No. 10 of 1987).

Republic of South Africa, 2004. Department of Environmental Affairs and Tourism, National Environmental Management: Biodiversity Act (No. 10 of 2004). *Government Gazette* Vol. 467 No. 26436 (7 June 2004).

Republic of South Africa, 2005a. Department of Trade and Industry, Patents Amendment Act (No. 20 of 2005). *Government Gazette* Vol.486 No. 28319 (9 December 2005).

Republic of South Africa, 2005b. Department of Environmental Affairs and Tourism, National Biodiversity Strategy and Action Plan.

Republic of South Africa, 2007. Department of Labour. Farm Workers' Minimum Wage Increases 2007/8. Available from: http://www.labour.gov.za/media-desk/-media-statements/2007/farm-workers2019-minimum-wage-increases-2007-8 [Accessed 18 July 2009].

Republic of South Africa, 2008a. Department of Trade and Industry, Policy Framework for the Protection of Indigenous Traditional Knowledge through the Intellectual Property System and the Intellectual Property Laws Amendment Bill. *Government Gazette* Vol. 515 No. 31026 (5 May 2008).

Republic of South Africa, 2008b. Department of Environmental Affairs and Tourism, National Environmental Management: Biodiversity Act: Regulations on Bioprospecting, Access and Benefit-Sharing. *Government Gazette* Vol. 512 No. 30739 (8 February 2008).

Republic of South Africa, 2009. National Environmental Laws Amendment Act (No. 14 of 2009) Government Gazette Vol. 527 No. 32267 (27 May 2009).

Republic of Transkei, 1992. The Environmental Conservation Decree (Decree No. 9 of 1992).

Ribot, J.C. 1998. Theorizing Access: Forest Profits along Senegal's Charcoal Commodity Chain. *Development and Change*, 29, 307-341.

Ribot, J.C. 2000. Rebellion, Representation, and Enfranchisement in the Forest Villages of Makacoulibantang, Eastern Senegal, in Zerner, C. (ed.) *People, plants, and justice: The politics of nature conservation*. New York, Columbia University Press, 134-158.

Ribot, J.C. 2005. Policy and Distributional Equity in Natural Resource Commodity Markets: Commodity-Chain Analysis as a Policy Tool. A research concept paper.

Ribot, J.C. and Peluso N.L. 2003. A Theory of Access. *Rural Sociology* 68(2) 153 – 181.

Richerzhagen, C. and Holm-Mueller, K. 2005. The Effectiveness of Access and Benefit Sharing in Costa Rica: Implications for National and International Regimes. *Ecological Economics* 53, 445-460.

Schippmann, U., Leaman, D.J. and Cunningham, A.B. 2002. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues, in *Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries*. Satellite event on the occasion of the 9th regular session of the Commission on Genetic Resources for Food and Agriculture, Rome, 12-13 October 2002.

Schroeder, D. 2009. Justice and Benefit Sharing, in Wynberg R., Schroeder, D. and Chennells (eds.) *Indigenous peoples, Consent and Benefit Sharing: Learning from the San-Hoodia Case*. Springer.

Schwabe, 2009. From Nature for Health. Dr. Willmar Schwabe Pharmaceuticals. March 2009. Available from: http://www.schwabepharma.com/international/about-us/facts-and-figures/index.php [Accessed 8 July 2009].

Scoones, 2009. Livelihoods Perspectives and Rural Development. *Journal of Peasant Studies*, 36 (1) 1 – 26.

Shackleton, C. and Shackleton, S. 2004. The Importance of Non-Timber Forest Products in Rural Livelihood Security and as Safety Nets: A Review of Evidence from South Africa. *South African Journal of Science* 100, 658-664.

Shackleton, C. and Shackleton, S. 2006. Household Wealth Status and Natural Resource Use in the Kat River Valley, South Africa. *Ecological Economics* 57, 306–317.

Shackleton, S., Campbell, B., Lotz-Sisitka, H. and Shackleton, C. 2008. Links between the Local Trade in Natural Products, Livelihoods and Poverty Alleviation in a Semi-Arid Region of South Africa. World Development 36 (3) 505–526.

Shale, T.L, Stirk, W.A. and van Staden, J. 1999. Screening of Medicinal Plants used in Lesotho for Anti-bacterial and Anti-inflammatory Activity. *Journal of Ethnopharmacology* 67, 347–354.

Shipton, P. and Goheen, M. 1992. Understanding African Land-holding: Power, Wealth, and Meaning. *Africa* 63 (3) 307–325.

Shiva, V. 1996. Protecting our Biological and Intellectual Heritage in the Age of Biopiracy. Seminar on IPRs, Community Rights and Biodiversity: A New Partnership for National Sovereignty. New Delhi.

Shiva, V. 2006. Social Movement and Biopiracy. New Dehli, Research Foundation for Science, Technology and Ecology.

Smith, A. 1895. A Contribution to the South African Materia Medica, Third Edition. South Africa, Lovedale.

Smucny, J., Fahey, T., Becker, L. and Glazier, R. 2004. Antibiotics for Acute Bronchitis. Cochrane Database Systematic Review 18, CD000245.

SoE, 2004. Department of Environmental Affairs and Tourism. State of the Environment Report, Chapter 12: The Eastern Cape Province.

Stats SA, 2009. Unemployment Rate by Province. Available from: http://www.statssa.-gov.za/PublicationsHTML/P02111stQuarter2009/html/P02111stQuarter2009_10.html [Accessed 10 July 2009].

Swanson, T. 1995. Diversity and Sustainability: Evolution, Information and Institutions, in Swanson, T. (ed.) *Intellectual Property Rights and Biodiversity Conservation*. Cambridge, Cambridge University Press, 1-16.

Taylor, P.W., Maalim, S. and Coleman, S. 2005. The Strange Story of Umckaloabo. *Pharmaceutical Journal* 275, 790-792.

Tedlock, B. 2006. Indigenous Heritage and Biopiracy in the Age of Intellectual Property Rights. *Explore* 2(3) 256-259.

ten Kate, K. and Laird, S.A. 1999. *The Commercial Use of Biodiversity. Access to Genetic Resources and Benefit-Sharing*. London, Earthscan.

Thomson, 1991*. Customs in Common*. New York, New Press.

Tully, S. 2003. The Bonn Guidelines on Access to Genetic Resources and Benefit Sharing. *RECIEL* 12 (1) 84-98.

UNECA, 2003. Land Tenure Systems and Sustainable Development in Southern Africa. United Nations Economic Commission for Africa,

ECA/SA/EGM.Land/2003/2. Available from: http://www.uneca.org/eca_resources/Publications/srdcs/-Land_Tenure_Systems_and_sustainable_Development_in_Southern_Africa.pdf [Accessed 14 June 2009].

UNEP, 1994. Convention on Biological Diversity. Text and Annexes. UNEP/CBD/94/1, Chatelaine, Switzerland.

van der Linde (ed.) 2006. *Compendium of South African Environmental Legislation*. Cape Town, ABC Press.

van der Walt, J.J. and Vorster, P.J. 1988. *Pelargoniums of Southern Africa including Some Representative Species from Other Parts of the World.* Vol. 3. National Botanic Gardens, Kirstenbosch, South Africa.

van Wyk, B.E. 2008. A Review of Khoi-San and Cape Dutch Medical Ethnobotany. *Journal of Ethnopharmacology*, 119, 331-341.

van Wyk, B.E. and Brendler, T. 2008. African Herbal Pharmacopoeia: *Pelargonium sidoides* DC. African Association for African Medicinal Plant Standards.

Watt, J.M. and Breyer-Brandwijk, M.G. 1962. *The Medicinal and Poisonous Plants of Southern Africa*. Edinburgh, E.S. Livingstone.

Welford, R., Meaton, J. and Young, W. 2003. Fair Trade as a Strategy for International Competitiveness. *International Journal of Sustainable Development and World Ecology* 10, 1-13.

White, A.G., Davies-Coleman, M.T. and Ripley, B.S. 2008. Measuring and Optimising Umckalin Concentration in Wild-harvested and Cultivated *Pelargonium sidoides* (Geraniaceae). *South African Journal of Botany* 74, 260-267.

WHO, 2002. Traditional Medicine Strategy 2002 – 2005. Geneva, World Health Organization.

WHO, IUCN and WWF, 1993. *Guidelines on the Conservation of Medicinal Plants*. Gland, IUCN.

Wilson, F. and Ramphele, R. 1989. *Uprooting Poverty: The South African Challenge*. Cape Town, David Philip.

WIPO, 2009. World Intellectual Property Organisation. Available from: www.wipo.int [Accessed 25 July 2009].

Wynberg, R. 2006a. Identifying Pro-poor, Best Practice Models of Commercialisation of Southern African Non-timber Forest Products. PhD Thesis, University of Strathclyde, Graduate School of Environmental Studies.

Wynberg, R. 2006b. South African Legislative Case Study, in Lewis-Lettington R.J. and Mwanyiki S. (eds) *Case Studies on Access and Benefit-Sharing*. International Plant Genetic Resources Institute, Rome, Italy.

Wynberg, R. and Laird, S. 2007. Bioprospecting: Tracking the Policy Debate. *Environment* 49 (10) 20-32.

Zenzile, M.L. 2007. A Study of the Amathole District Municipality's Settlement Plan in the Light of the Land Reform and Spatial Planning Measures. Master of Laws Thesis, Rhodes University.

Zerner, C. 2000. Introduction: Toward a Broader Vision of Justice and Nature Conservation, in Zerner, C. (ed.) *People, Plants and Justice – The Politics of Nature Conservation*. New York, Columbia University Press.

APPENDIX 1: LIST OF INTERVIEWEES

Informant	Affiliation
Industry	
Kersten Paulsen	**BZH**, Hermanus, South Africa
Ulrich Feiter	**Parceval**, Wellington, South Africa
Herman Nieuwoudt	**Bophelo Natural Products**, Mohale's Hoek, Lesotho
Roy Gowar	**Gowarenterprises**, Grahamstown, South Africa
Dr Waimer	**Schwabe**, Karlsruhe, Germany
Government	
Noluthando Bam	Provincial **Department of Economic Development and Environmental Affairs**, Bhisho
Carina Malherbe	National **Department of Environmental Affairs and Tourism**, Pretoria
Refiloe Ntoshi	**National Environmental Secretariat**, Maseru, Lesotho
Other	
Pumile Matakhane	Agricultural Representative, **Imingcangathelo Trust**, Alice

APPENDIX 2: HARVESTER QUESTIONNAIRE

	Research Question	Focus Group Questions
1.	Estimating the level of involvement with the industry.	1.1. How did you get involved in harvesting? 1.2. When did you start harvesting? 1.3. Why did you start harvesting? 1.4. Do you know what happens to the harvested material after you have collected it? What is it used for?
2.	Issues of sustainable use of the plant.	2.1. How do you remove the roots/tubers? 2.2. Do you use a spade or pick? 2.3. Do you leave a part of the plant underground? 2.4. Do you re-plant after harvesting? 2.5. Has it become more difficult to find the plants? If so, why?
3.	What is the value of the plant for personal use?	3.1. Do you use the plant yourself? 3.2. If so, what do you use it for? 3.3. How do you use it?
4.	What are the financial rewards related to wild harvesting of *P. sidoides*?	4.1. When do you harvest – is it seasonal? 4.2. How much do you get paid per kilogram/bag? 4.3. Who collects the material? 4.4. How often is it collected? 4.5. How are collection dates/times arranged? 4.6. Can you negotiate the price? 4.7. How is it weighed? 4.8. How long does it take to collect 1 kilo? 4.9. What do you use the money for? 4.10. What other jobs do you do? (How much do they earn each year or season from harvesting? 4.11. What stops you from earning money from *P. sidoides*?
5.	What are the benefits related to cultivating the plant?	5.1. Do you cultivate the plant here? 5.2. When did cultivation start? 5.3. Who started it?

		5.4. Who pays for the water, seedlings, tractor etc.? 5.5. How many people are involved in cultivation? 5.6. How much do you expect to earn for 1 kilogram (wet weight)? 5.7. How do you share the money from selling *P. sidoides* with the community? 5.8. Is cultivation worthwhile? In terms of effort, time and income? 5.9. How do you cultivate? Do you intercrop with vegetables? 5.10. Are there buyers for the material?
6.	What non-monetary benefits can be realised from the trade with *P. sidoides*?	6.1. Has any harvester training been done? By whom? 6.2. Has any training regarding cultivation methods been done? By whom? 6.3. Have any other projects such as bore-holes, clinics, vegetable gardens etc. been implemented because of the interest in *P. sidoides*? 6.4. Has the infrastructure been improved? 6.5. How has it changed your life? What benefits have you got aside from money?
7.	Assessing the role of legislation.	7.1. Do you need permits to harvest? 7.2. What are the costs involved? 7.3. Are there any difficulties regarding the laws or law enforcement? 7.4. Are harvesters involved in monitoring themselves? 7.5. Are there any customary laws that regulate harvesting and use of *P. sidoides*? 7.6. Do you know about new laws to share benefits? What do these laws mean to you?
8.	Estimating future expectations.	8.1. Is there is a future for you/your community in *P. sidoides* harvesting? If not, why not? 8.2 Do you want to continue harvesting? 8.2. Do you want to establish a cultivation project? 8.3. What would you like to see happen in

		the future? 8.4. What are the main problems associated with the industry?

APPENDIX 3: INDUSTRY QUESTIONNAIRE

The following questions were adapted according to the level of involvement each company has in the *P. sidoides* trade.

	Research Question	**Interview Question**
1.	How is the company involved in the trade in *P. sidoides*?	1.1. How did _____ become involved in the trade in *P. sidoides*? 1.2. How do you perceive the future of trade in *P. sidoides*?
2.	What is the company's involvement in the *P. sidoides* trade in South Africa?	2.1. Who supplies your company with material? 2.2. How much material does _____ buy per year? (Dry weight or wet weight?) 2.3. How much is paid for the material per kilogram? 2.4. Does _____ export plant material? 2.5. If so, who are your partners in international trade? 2.6. How much material is exported per year? 2.7. Besides the Eastern Cape, is material obtained from other SA provinces? 2.8. Is the material processed in South Africa? 2.9. In your opinion, is it possible for more value-adding to be done in SA? 2.10. How do government policies and regulations affect the trade in *P. sidoides*? 2.11. What are the main problems associated with the legislative environment?
3.	How is the company involved in the *P. sidoides* trade in Lesotho?	3.1. How long has _____ been trading with *P. siodides* in Lesotho? 3.2. Who are your main partners in Lesotho? 3.3. How much material does _____ buy per year? 3.4. How much is paid per kilogram of material? 3.5. Does any value-adding/processing take place in Lesotho? 3.6. In your opinion, is it possible for more value-adding to be done in Lesotho? 3.7. What are the main problems associated with the legislative environment?
4.	What are the differences between wild harvested	4.1. Is _____ content with the quality of the active components in cultivated plants?

	and cultivated plant material?	4.2. Could you tell me more about the cultivation projects set up around South Africa? 4.3. How many cultivation projects are operational in Lesotho? 4.4. What are the problems associated with cultivation? 4.5. Is cultivation worthwhile? 4.6. Are any measures taken to ensure the sustainability of the resource? 4.7. Regarding the consumers in the EU and America - are they aware of the origin of P. sidoides - does it matter to them whether the material is cultivated or wild-harvested?
5.	What is the company's approach toward benefit-sharing and social responsibility?	5.1. Does _____ have social responsibility programs in place? 5.2. Has _____ been involved in a benefit-sharing agreement? 5.3. If so, when was it initiated? 5.4. Who are the partners involved? 5.5. How many community members stand to benefit from this BSA? 5.6. Is there any guarantee of a long-term relationship? 5.7. What time-frame is envisioned? 5.8. What does the BSA entail/how does it function? 5.9. Does the project involve any training/capacity building?
6.	What are the pitfalls associated with trading in *P. sidoides* in South Africa?	6.1. Do you know how long *P. sidoides* has been cultivated in Kenya? 6.2. Do you know who initiated it? 6.3. What prompted the move away from SA? 6.4. What are the obstacles faced by traders in SA? 6.5. How could this be improved in your opinion?

APPENDIX 4: GOVERNMENT QUESTIONNAIRE

The following set of questions was adapted for officials from provincial and national departments.

	Research Question	Interview Questions
1.	How does national and provincial legislation regulate the use and trade in *P. sidoides*?	1.1. How does the permitting system work? What are the costs involved? 1.2. Are traditional authorities or chiefs included in negotiations? 1.3. Is a pricing structure followed? Does this include negotiations with the industry and communities?
2.	What are the legal restrictions regarding wild harvesting?	2.1. Is there concern for the sustainability of the resource? 2.2. Have there been instances of illegal harvesting? 2.3. Have there been any prosecutions following illegal harvesting? 2.4. What prompted the implementation of the ban on wild harvesting (in the Eastern Cape)?
3.	What are the regulations around cultivation?	3.1. Do prospective cultivators need to apply for permits? 3.2. What is the procedure for establishing cultivation sites?
4.	What are the requirements for benefit-sharing agreements?	4.1. Have there been any applications for benefit-sharing agreements? 4.2. Which government department will approve the agreements? 4.3. Is *P. sidoides* the first case of benefit-sharing in the country? 4.4. Are traders seen as bio-prospectors? 4.5. Are BSAs based on a percentage of profits? 4.6. How will the bioprospecting fund operate (in South Africa)?
5.	How does the government perceive the future of the	5.1. What are the economic benefits of the *P. siodoides* trade nationally?

	trade in *P. sidoides*?	5.2. Does the government view the trade in this species as a positive contribution to alleviating rural poverty? 5.3. Is national legislation adequate to prevent exploitation of the species? 5.4. Is it foreseen that the plant will be classified as threatened in the future? 5.5. Is there enough capacity to ensure enforcement and monitoring? 5.6. What are the main concerns relating to this industry? 5.7. How does the government view the future of the trade in this species?

APPENDIX 5: FAIRWILD STANDARDS