MARKETING OF INDIGENOUS MEDICINAL PLANTS IN SOUTH AFRICA

A case study in Kwazulu-Natal

Food and Agriculture Organization of the United Nations

MARKETING OF INDIGENOUS MEDICINAL PLANTS IN SOUTH AFRICA

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by
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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 1998

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FOREWORD

The emphasis on sustainable forestry as a means of making forestry contribute efficiently to sustainable development has drawn increasing attention to the ecological aspects, active involvement of people and utilization of forest resources in a comprehensive manner.

Sustainable and comprehensive utilization of forest resources is achieved through appropriate harvesting, processing and marketing of both wood and non-wood forest products. Although non-wood forest products have been utilized extensively by local populations, relatively little systematically documented information exists. With the rapid urbanization in developing regions, the importance of understanding thoroughly the commercial aspects of many of these products is becoming vital.

Medicinal plants comprise one of the major non-wood forest product categories on the marketing of which information is scarce, although the use of traditional medicines is a common practice in many parts of the world.

FAO, through its Forest Products Marketing Programme, aims, *inter alia*, at increasing and documenting the knowledge of current marketing practices in order to provide a solid basis for further development. The Programme, being part of the normative activities of FAO, also makes every effort to contribute to the development of approaches and methodologies for the preparation of case studies on marketing practices.

In South Africa there are long-standing traditions for the gathering and processing of medicinal plants for the markets. The increasing interest in traditional medicines has, however, boosted the gathering activities from natural sources to an alarming level. In order to increase the knowledge of the traditional medicine sector, the Institute of Natural Resources of the University of Natal has initiated a project to promote the cultivation of indigenous plants for markets that include selected medicinal plants. This case study by FAO, therefore, also provides an input to the sector study by the Institute of Natural Resources.

FAO would like to record its appreciation to the Institute of Natural Resources and, through it, to the numerous people and organizations for their contributions to the study.

Specific thanks are recorded to Mr Myles Mander as an FAO consultant for his work in the actual collection of information, analysis and writing up of the case study report.

Appreciation is also recorded for the editing of the report for printing by Ms Elisa Rubini, Secretary, and the supervision of the work by Mr L. Lintu, Senior Forestry Officer, Forest Products Division of FAO.

It is hoped that this case study will provide a valid model of an approach and method to assess the marketing practices of non-wood forest products and those of medicinal plants in particular.

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1. Introduction

The current demand for numerous popular plant species used for indigenous medicines exceeds supply. To date, several plant species, such as wild ginger (*Siphonochilus aethiopicus*) and the pepper-bark tree (*Warburgia salutaris*) have become extinct outside of protected areas in KwaZulu-Natal. The declining supply of indigenous medicinal plants is likely to generate significant economic and welfare losses considering that there are some 27 million indigenous medicine consumers in South Africa and a large supporting industry. There would be additional losses as potential income generating opportunities associated with a growing local and international demand are not realised. Furthermore, intensive harvesting of wild stocks is a serious threat to biodiversity in the region with over 700 plant species actively traded in South Africa.

Photo 1: Pepper bark (Warburgia salutaris) being traded at Nongoma. This bark has been harvested in Mozambique and is likely to be bought by traders from Durban and Johannesburg (three to four hours away by car).

As a result of the declining supply of medicinal plants and the localized extinctions that have occurred, Cunningham [1988] recommended the cultivation of indigenous medicinal plants. However

there has been little response to these recommendations and/or to increases in market prices. It became clear that there was insufficient knowledge of the economics of indigenous plant production and the associated markets. The lack of information has prevented individuals, organizations and government bodies assessing opportunities in cultivating indigenous medicinal plants for the market.

Consequently, a research project was initiated by the Institute of Natural Resources to investigate the economic feasibility of cultivating high value medicinal plants for local medicinal markets, with a focus on the cultivation potential, production costs and marketing.

This report covers the marketing aspect of the larger research project. The market study aims to describe the demand, supply, current marketing practices, potential and limitations within the medicinal plant market and makes recommendations for a wide range of decision-makers.

The case study has had a spatial focus on the KwaZulu-Natal province in South Africa, and specifically on Durban (a city with 4 million people). The province is an area of active plant harvesting, trade and consumption, with Durban forming the hub of the regional plant trade. The other provinces in South Africa also have an active trade in indigenous medicines, and some reference will be made to national trends in the case study.

2. The demand for indigenous medicines

The demand for indigenous medicines and services is considerable relative to the demand for western health care services. The black population in Durban indicated that they relied on both health care systems, with 60% of the health care services demanded coming from western health care systems and 40% of the services demanded coming from indigenous medicine. It is estimated that there are 6 million indigenous medicine consumers in KwaZulu-Natal, and 27 million consumers in South Africa. Households were spending between 4% to 8% of their annual incomes on indigenous medicine services. As indigenous medicine is based almost entirely on the use of indigenous plants, a massive demand is generated in terms of both the numbers and the mass of plants consumed. In KwaZulu-Natal, over 4 000 tonnes of plant material is traded in a year, with a value of US$ 13 million (R 60 million), some one-third of the value of the annual maize harvest in the province. At a national level, 20 000 tonnes may be traded in a year, with a value of approximately US$ 60 million (R 270 million).

The demand for medicinal plants is likely to remain buoyant in the future. Consumers indicated that indigenous medicine was not an inferior good and demand is unlikely to decline should income levels and welfare increase in the future. On the contrary, urban consumers indicated they anticipated that their consumption of indigenous medicine would either remain at current levels or increase, despite indigenous medicine being more expensive than subsidized western health services provided by government. Consumers also indicated that western medicine was not an alternative to indigenous medicine and that irrespective of price, they would have to continue to use indigenous medicine. There are a wide range of ailments and needs which cannot be adequately treated by western medicine. This implies that indigenous medicine is a basic consumer good, essential for the welfare of black households.

The AIDS pandemic in the region, and the growing international demand for South African medicinal products, are also likely to increase the demand for indigenous medicine products in the future.

3. The supply of indigenous medicines

The indigenous medicine market is based on indigenous plants that are generally harvested from wild plant stocks in KwaZulu-Natal, neighbouring provinces and other countries. The plant stocks and their harvesting are not managed and little cultivation takes place. The combination of high demand and the lack of any significant resource management and plant production have resulted in a decline in the supply of numerous indigenous medicinal plants.

A wide range of plant species is showing indications of unsustainable use, with the size of the products decreasing, distances to stocks increasing (for example, in the last eight years there has been a 45% increase in travel time between popular plant sources and the market), supply becoming increasingly irregular, and/or some plants becoming unavailable in certain markets. Some popular plants have become extinct outside of protected areas in KwaZulu-Natal. The supply of indigenous medicinal plants is clearly not sustainable using the current harvesting strategies.

The scarcity of popular plants has led to their under-supply, with considerable increases in product prices [for example, *Siphonochilus aethiopicus* is regularly traded for US$ 100/kg (R 450/kg)], imports into the province, and the use substitute plants. In addition, there has been an increase in the use of destructive harvesting techniques, which aim maximize the harvest from declining plant stocks in order to maintain income levels in the short term.

There is however options for sustaining the supply of plants to markets. There are extensive areas of grasslands, woodlands and thickets on private property that have not been intensively harvested in the past. With effective management, these areas could supply many products to markets in the long term. However, the volumes of plant resources available in these areas and the harvesting strategies which should be applied, need to be investigated. In terms of forest species, there are limited forest areas available and consequently management of existing stocks is unlikely to meet market demand. In addition, the most popular plants, irrespective of their habitat, now exist in such small quantities that management of existing stocks is unlikely to supply consumer needs.

The cultivation, management and enrichment planting of high value plants are therefore an important strategy to meet consumer demand and to reduce the impacts of the market on biodiversity. The success of cultivation trials undertaken to date has shown good potential for this strategy. Fast growing species could be supplied in sufficient quantities within a few years. However, the slow growing popular trees, particularly forest trees, are unlikely to supply the bark quantities demanded in the short term, and alternative products need to be investigated.

4. The marketing of indigenous medicinal plant products

Over 400 species of plants are marketed in large quantities within KwaZulu-Natal. While the mixing and prescription of plant products is sophisticated, the processing and development of products is extremely limited. There is little processing and value-added to products, with most products sold in the raw form. The most sophisticated product form is a mixture of ground plant parts. There is little standardization in product quality and recycled waste is used for packaging. The entire industry is dominated by simple technology. Most of the value is added when an indigenous healer prescribes medicines.

The plant products are marketed to consumers as self-medication or as healers' prescriptions. The products are marketed within residential areas dominated by black consumers or at transport nodes throughout urban and rural areas. The conditions in the markets are generally poor, with most consumers indicating that they would prefer more modernized and hygienic trading sites. The lack of storage facilities and trading infrastructure frequently results in the spoiling of raw materials, resulting in wastage and/or a decrease in product quality. Both the healers and consumers have indicated that they are concerned about the quality of the products purchased in the markets.

There is currently no certification of indigenous medicines traded, however, there is legislation which requires the registration of products traded as medicines. The legislation is currently not applied to the indigenous medicine industry due to the informal nature of the trade. This legislation may limit investment in the formal cultivation of plants for the indigenous medicine industry. Unless the current legislation is changed, the production of plants for local markets may be limited.

The supply of plant products is not only critical for the welfare of approximately 27 million consumers, but it is also critical for the welfare of people employed in the industry. In KwaZulu-Natal

there are between 20 000 and 30 000 people who derive an income trading indigenous plants in some form. Importantly, most of the people involved are black rural women, who are the most marginalized group in South African society. The medicinal plant industry therefore plays a critical role in empowering a large number of rural women.

Overall, the marketing of medicinal plants is poorly developed. Consumers and traders in plant products could benefit considerably through the development of both the products and markets.

5. Institutional support for the marketing of indigenous medicinal plants

In terms of policy support, very little policy has been developed to support the marketing of indigenous plants, with most policy designed to limit the marketing of indigenous medicinal plants. There are several regulatory mechanisms (associated with first world standards for medicines and biodiversity priorities) in place but are not being implemented at present. The medicines' regulatory mechanisms could threaten any commercial plant production and product development, particularly in sectors with limited financial resources and which are unlikely to be able to meet the standards required by existing legislation.

As a result of a largely negative policy environment, there has been insignificant education, training, research and extension regarding medicinal plant markets. Most research and development support from government and business has been directed at bio-prospecting and pharmacological investigations. There are few efforts directed at developing the current markets, their associated products, infrastructure and market players. Some efforts have been directed at training market players in the cultivation of medicinal plants but it is insignificant relative to the size of the market. There is an imbalance in support for indigenous medicine, with most investment directed at seeking commercially useful chemicals within medicinal plants, while little or no investment is being directed to maintain or increase the benefits which the current market is already delivering to millions of consumers.

Market information systems are poorly developed, resulting in considerable inefficiency within the markets. Market resources are wasted through inefficient coordination of trade activities. This is particularly problematic given the already short supply of plants and the inability of the current market players to absorb costs.

At the market level, there has been little development due to competition and the under-developed capacity of most market players. There is acute competition within the markets and this limits the sharing of knowledge between market players, especially the healers. There is no literature available at present which healers can use as a reference for administering indigenous medicine. Furthermore, with high levels of illiteracy and few business skills, the industry has been unable to develop. In terms of the healers, there are numerous healers' organizations which serve the healers' interests. However, as they focus largely on practice issues, and little investment is made at an industry level.

The combination of a negative policy environment and the limited capacity of market players to cooperate and promote their own development, has resulted in an industry which is large but underdeveloped.

6. Potential scenarios for the medicinal plant industry

The characteristics of demand, supply, marketing and institutional support generate a number of opportunities and constraints for the indigenous medicinal plant industry, and include:

- a large and growing local and international demand for medicinal plants,
- a declining supply of forest species in the short term,
- a fluctuating supply of grassland and savannah species in the short term,
- an increase in the price of scarce plants,

- the diverse cultivation potential of indigenous medicinal plants,
- an increase in the numbers and diversity of market players,
- a negative policy environment in the short term, and
- the majority of the current market players having limited business skills in the short term.

The above opportunities and constraints can be considered relatively fixed factors in the short term. In contrast to the fixed factors, there are variable factors which will to a large extent determine how the market may change in the future. The key variable factors are driven by the actions of different market players and associated authorities. The variable actions of these key players include:

- the degree to which the current market players cooperate to develop a common vision and lobby for government support,
- the responses of government departments (Health, Agriculture, Trade and Industry, Water Affairs and Forestry, and Environment and Tourism) to the indigenous medicine industry,
- the responses of national, provincial, and local political leaders to the indigenous medicine industry,
- the response of business to the opportunities in the industry, and
- the quantities demanded by consumers for different levels of processed, certified, standardized, and packaged products.

The study identified three potential scenarios which could develop depending on the actions of key role players in the markets. The possible scenarios are as follows.

Scenario 1 - No intervention - the continuation of the *status quo* - where there is limited investment in promoting the supply and development of popular plants and products in association with current market players. Consequently, large commercial interests are likely to cultivate high value plants and trade processed products, while most of the current market players continue to compete for a decreasing share to a declining stock of popular plants. A narrow range of species (the high value species) would be cultivated, processed, and distributed for the upper end of the market with a small number of large business interests benefiting. Biodiversity and health care will be negatively impacted.

Scenario 2 - Industry driven intervention - collaboration between progressive current market players and skilled business interests - is likely to offer large benefits to large and intermediate companies and to a limited number of current market players. Cultivation, processing, and distribution would occur for the middle and upper end of the market. Small-scale traders and gatherers are likely to continue to trade in wild plants, but supply is likely to decline as wild stocks are depleted. Biodiversity and health care will be negatively impacted.

Scenario 3 - Collaborative intervention - collaboration between many current market players, government and business interests - this could see the development of a wide range of processed products from simple rural products to sophisticated pharmaceutical products. Plant cultivation would take place from the subsistence level through to large commercial estates. Numerous market players could develop a range of different quality products for a wide range of consumers, with different prices suited to the consumers' budgets. Such a scenario, is likely to promote the growth of the industry, and promote development at a broad scale. Investment in resource management and biodiversity conservation is also more likely in this scenario. Health care would benefit.

The most likely scenario to develop is number 2, where big business enters the market and leads market development to suit its own objectives. Current investments by both government and big business are supporting the development of this scenario. Furthermore, current legislation supports the development of the corporate sector by excluding the less developed market players from producing more commercialized indigenous plant products. The costs of this scenario will be borne largely by the current consumers, who will lose access to basic consumer goods through price increases and scarcity, and numerous current market players will lose income-earning opportunities.

As the current consumers and current market players are largely from the least developed sector of South African society, it is essential to initiate market interventions which promote the welfare of the current consumers and market players, especially at the lower end of the market. At the same time, the opportunities for large-scale corporate involvement at the upper end of the market and in international markets, should be supported. To maximize the benefits to the greatest number of beneficiaries, South Africa needs to focus on achieving the development of both the existing market players and corporate entrants.

The development of the indigenous medicine market in South Africa will promote economic growth, people's development, consumer welfare, and biodiversity conservation. However, this will only be achieved if development takes place across the whole spectrum of the market, from rural resource management and marketing through to corporate bio-prospecting and production.

The challenge facing the South African community is to capitalise on the market opportunities and to overcome the market constraints in the medicinal plant industry through achieving a greater balance in the distribution of development resources in public and private sector.

7. Recommendations

The market study has shown that the under-development of the market has significant negative implications for consumer welfare, market players, state expenditure and biodiversity. The development of the market is therefore critical in promoting widespread welfare and in limiting the costs (direct and indirect) which society will bear as a result of continued market under-development.

Development requires actions at two key levels. Firstly, coordinated support for the indigenous medicine industry needs to be developed amongst policy-makers in all levels of government (and within a range of departments), in business and in NGOs. A supportive, consistent and positive policy and regulatory environment needs to be developed for the indigenous medicine industry. Secondly, development actions are required within the market itself. However, little significant market development will occur without a positive policy environment and a coherent strategy for industry transformation.

7.1 Recommendations for optimizing opportunities in market demand

Recommended actions regarding the growing demand for indigenous medicinal plants as a basic consumer good in South Africa, other African countries and abroad are:

- Decision-makers at all levels of government, business and civil society need to acknowledge of the magnitude and permanence of indigenous medicine and the associated indigenous plant demand.
- Promote public awareness and open discussion regarding the demand and utilization of indigenous medicine.
- Investment in supply and market development should be undertaken given an assured market for indigenous medicine products.
- New opportunities should be investigated as demand grows.
- Export opportunities should be investigated and developed.
- Exploit consumer reverence for indigenous plants for the promotion of biodiversity conservation.

Recommended actions regarding consumer preference for better quality products and packaging, and for more modern dispensing locations and retail outlets are:

- Products, packaging and retail outlets and dispensing establishments should be improved to meet consumer demand and promote consumer welfare.

- Decision-makers in government and business should be made aware that consumers are not satisfied with the standards of products and market infrastructure.
- A focused information and technology transfer system should be developed to inform market players.

Recommended actions for optimizing the lack of accepted alternatives and the demand being relatively unresponsive to price changes are:

- There should be investment in product and market development in several sectors and for several species as demand for higher priced products exist.
- A range of different standard products with a range of prices should be marketed and response monitored to identify the levels of demand, and potential opportunities for expansion.

Recommended actions regarding the adaptability of indigenous medicine are:

- Identify development opportunities for South Africa from Indian and Chinese experiences in the development of indigenous medicine markets.
- Test the market for new product acceptability, in collaboration with indigenous healers, traders and consumers.

7.2 Recommendations for optimizing opportunities in market supply

Recommended actions for management and utilization of existing wild plant stocks are:

- Populations of scarce plants should be identified, and genetic material preserved appropriately using resource protection, and the establishment of gene banks conserving the diversity in genetic material from various localities.
- A programme for promoting the farming medicinal plants in commercial and communal rangelands and forests should be developed, and should include:
  - information dissemination regarding values and opportunities,
  - demonstration of management and harvesting techniques in different habitats,
  - provision of ongoing technical expertise to farmers in management, harvesting and marketing of wild plants through an extensive extension programme,
  - provision of source materials, including seeds and cuttings, for enrichment planting,
  - the development of economic models for estimating returns on wild plant farming.
- The traders' demand for bark products should be coordinated with logging operations in indigenous forests.
- The process of authorizing land use changes such as afforestation, water impoundment and other land clearing activities should incorporate mandatory plant salvage operations.
- Research into the sustainable harvesting of wild plants at both the population and individual plant level should be undertaken.

Recommended actions for the optimal use of existing expertise in plant cultivation, processing and marketing are:

- Establish a directory of individuals with appropriate expertise and services.
- Develop a networking system between potential suppliers of expertise and services, and the market players requiring expertise. A funding system would need to be established to facilitate the transfer of expertise to poorly resourced market players.
- Identify and access appropriate international expertise and case studies with potential for contributing to the southern African situation. Develop and publish guidelines for cultivation, processing and marketing from the lessons learnt in other countries.

- Build on the expertise of current market players, particularly the plant harvesters, who can use their existing expertise to promote more efficient supply and marketing. Training programmes with appropriate curricula would need to be established in various accessible centres.
- Build on the expertise of institutions which have already developed extensive knowledge in production, cultivation, processing and marketing.

Recommended actions for optimizing the demand for new agricultural opportunities are:

- Make market information, agronomic schedules and production costs available to farmers via various media and through training extension workers in agriculture and forestry departments.
- Reform obstructive legislation which prevents the commercial production of medicinal plants.
- Provide short courses in the propagation, cultivation, and marketing of medicinal plants for a range of farming skills and literacy levels.

Recommended action for optimizing the existing market information systems is:.

- Develop a marketing information system appropriate to existing trade networks and appropriate to market participants' skills.

7.3 Recommendations for minimizing constraints in market supply

Recommended actions for addressing the negative policy environment and obstructive regulatory mechanisms which impact on the supply of plants are:

- Inform policy-makers of the negative impact of current policies and regulations on consumer welfare, industry sustainability, economic development and biodiversity.
- Inform policy-makers of both the cost savings and potential opportunities which the medicinal plant trade creates.
- Inform market players of the need to lobby for policy-change and reform of regulations concerning the trade in medicinal plants.
- Inform decision-makers of the potential human and economic development opportunities associated with the indigenous medicine trade.
- Use international case studies as examples for South African policy-makers.
- Develop support for policy-reform in leading political figures. There needs to be a champion for the reform of government policies in the trade of plants and plant products.
- Establish a medicinal plant strategy unit for southern Africa to develop coordinated policies between states and to generate information for informing policy-at a national and international level.

Recommended actions for addressing institutional constraints regarding market supply are:

- Identify sources of funding from outside of government departments to reduce conflicts over already limited government resources.
- NGOs, government departments and market players should collaborate and develop partnerships with international funding agencies to obtain resources for new initiatives.
- Develop an advocacy programme for showing the benefits of developing the medicinal plant trade to government officials in local, regional, and national governments. This action would be closely associated with the medicinal plant strategy unit recommended above.
- Establish a team of collaborators in government departments who should be stakeholders but who may not have the resources to lead any projects.

Recommended actions for limiting the disunity in the markets due to competition are:

- Inform market players of the potential benefits of greater market unity by using international examples.
- Organizational development should be promoted within various sectors in the industry.
- Promote the lobbying ability of market players through training courses.
- Promote the development of a cross-sectoral organization which could represent the interests of all market players.
- Promote a focus on personal business development to promote widespread support from all market players.

Recommended actions for promoting business skills within the medicinal plant market are:

- Basic literacy courses should be provided for gatherers and street traders.
- Courses in business skills should be developed for a range of enterprises.
- Courses on beneficiation at various stages in the marketing process should be developed and provided to market players, especially at gatherer and trader levels.

Recommended action for promoting more efficient marketing is:

- Development and implementation of a market information system and should include:
  - selecting locations for market information systems,
  - identification of participants in market information systems,
  - gathering information required to design a market information system,
  - design a market information system, and
  - implement a market information system.

Recommended actions for promoting the quantity of plants supplied to markets are:

- Programmes for the management of wild plants and the cultivation of plants are required at a range of scales to supply urban, rural and international consumers, and for supplying commercial processing of phytomedicines.
- Investment in cultivation must be made to reduce the reliance on wild plant stocks for the medicinal plant industry.
- The most popular species are an immediate priority that should be focused on, and include the nine species which are a focus of the market survey.
- Forest species are a higher priority than other species, and cultivation should be priority due to the small areas of forest remaining in South Africa.
- Slow growing forest species which are unlikely to be cultivated by commercial enterprises will need to be the focus of government and NGO activities.
- Grassland, savannah and thicket species should be the focus of management as relatively large stocks still remain on commercial farmland.
- Research needs to quantify and identify sustainable harvesting strategies for the wild plant stocks on commercial farms.

Recommended actions for promoting the quality of plants supplied to markets are:

- Research should identify genotypes with high potential for commercial purposes, and then conduct trials for the selection of high yielding varieties.
- High yielding variations within species need to be propagated and disseminated to farmers.
- Research should take place into the development of efficient packaging and storage of plant medicines.
- Promote the development of hygienic and convenient market places for consumers and traders.

Recommended action for research on the medicinal plant markets is:

- There should be a reorientation of research investment regarding medicinal plants, with a shift from pharmacological studies to research which identifies effective methods of sustaining market supply and improving the quality of products currently consumed.

1. INTRODUCTION

Indigenous medicine is widely used in South Africa, with reports of up to 80% of blacks in South Africa making use of traditional medicines [Holdstock 1978]. There are reports of over 100 000 indigenous healers practising in South Africa [Gericke *pers. comm.* 1996] and using indigenous plants as their *materia medica*. The plant trade is believed to generate a large volume of economic activity with an estimated value of US$ 110 year^{-1} (R 500 million year^{-1}) [SA Druggists *pers. comm.* 1996]. Observations of the market indicate that most of the plants are harvested from wild populations and are not cultivated. The current demand for numerous popular plant species used for traditional medicines exceeds supply, with traders reporting acute shortages and price increases. To date, several plant species, such as wild ginger (*Siphonochilus aethiopicus*) and the pepper-bark tree (*Warburgia salutaris*) have been exploited to such an extent that they are seldom found in unprotected areas [Cunningham 1988].

The declining supply of indigenous medicinal plants and the associated products is likely to generate significant economic and welfare losses considering the large number of people who either consume or trade indigenous medicinal plants. A decline in the availability of a culturally important and easily accessible consumer good is likely to generate significant losses for the user community. The loss of income-earning opportunities for people active in the plant trade will also represent a serious loss to those involved in the trade. Additional losses would also occur as potential income-generating opportunities associated with a growing local demand [Cunningham 1988] and international demand [Lange 1997] are not realised. Furthermore, intensive harvesting of wild stocks is a serious threat to biodiversity in the region with over 700 plant species traded in South Africa [Mander, Quinn and Mander 1997].

As a result of the declining supply of medicinal plants and the localized extinctions which have occurred, Cunningham [1988] called for the cultivation of indigenous medicinal plants for marketing. However, there has been little response to Cunningham's 1988 recommendations and/or to increases in market prices which have occurred in the intervening nine years. As supply diminishes and prices increase, the potential opportunities for cultivating indigenous medicinal plant products have increased substantially. The question arises as to why the higher prices have not stimulated the cultivation of high value medicinal plants in South Africa?

Discussions with agricultural economists [Lyne 1996, Darroch 1996] indicated that insufficient knowledge of the economics of indigenous plant production and associated markets, limited both cultivation initiatives and institutional support for such initiatives. The lack of information has prevented individuals, organizations and government bodies assessing opportunities in cultivating indigenous medicinal plants for the market.

Consequently, a research project was initiated by the Institute of Natural Resources, and supported by the Department of Environment Affairs and Tourism through the Human Needs, Resources and the Environment programme at the Human Sciences Research Council in South Africa. The project's aim was to investigate the economic feasibility of cultivating high value medicinal plants for local medicinal markets, with a focus on:

- the production potential and costs of cultivating important indigenous medicinal plants, and
- the markets for indigenous medicinal plants.

This report covers the latter aspect of the larger research project, that is, the market study component. The market study aims to describe the demand, supply, potential and limitations within the medicinal plant market and current marketing practices for the purposes of providing information and support for a wide range of decision-makers, including:

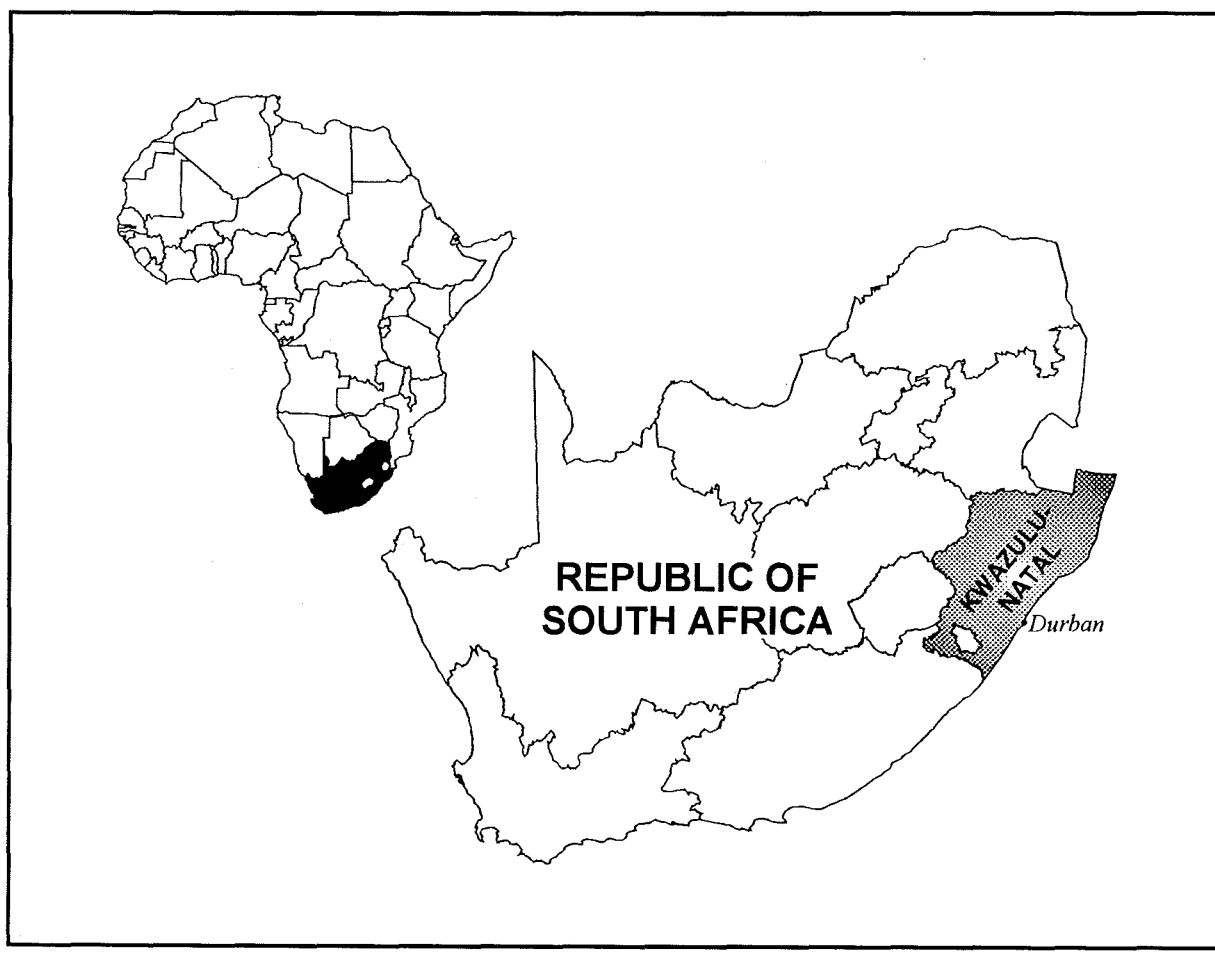
- small- and large-scale farmers,
- current market players,

- health authorities,
- conservation authorities,
- forestry authorities,
- policy-makers at all levels of government,
- communities and individuals which own or have access to medicinal plant resources, and
- various commercial interests.

As this study is one of the first comprehensive market surveys on medicinal plants undertaken in southern Africa, it aims to provide information that would be useful for a number of purposes. As there is little known about the South African market, largely due to the informal nature of the trade, the secrecy of trade attributed to the conflict between of plant traders and conservation authorities, and the past discrimination of indigenous medicine, the survey needed to provide information for a wide range of applications.

The case study has had a spatial focus on the KwaZulu-Natal province in South Africa, and specifically on Durban (a city with some 4 million people) (Figure 1.1). KwaZulu-Natal has a large black population (of some 6 to 7 million black people) with an active trade in indigenous medicine. The province is consequently an area of active plant harvesting, trade and consumption, with Durban forming the hub of the regional plant trade [Cunningham 1988]. The other provinces in South Africa also have an active trade in indigenous medicines, and some reference will be made to national trends in the case study, where information is available.

Figure 1.1: The spatial location of South Africa, the province of KwaZulu-Natal and Durban city



2. ACKNOWLEDGEMENTS BY THE AUTHOR

The market survey was made possible by the contributions of numerous people and organizations. Without the efforts and support of the committed individuals, the author would not have been able to undertake the study. All the contributors are gratefully acknowledged for their support. The following individuals have contributed to the success of the market survey:

L. Lintu	Food and Agriculture Organization of the United Nations
J. Mander	Institute of Natural Resources
C. Breen	Institute of Natural Resources
T. Ellis	Institute of Natural Resources
E. Makhathini	Geography Department, University of Natal
E. Bbenkele	Business Administration, University of Natal
N. Quinn	Water and Environment Group
V. Mkize	Durban City Health Department
C. Dube	Traditional Healers Umbrella Body
A. Robinson	Durban City Health Department
L. Govender	KwaZulu-Natal Herb and African Traditional Healers Traders Association
B. Naidoo	KwaZulu-Natal Herb and African Traditional Healers Traders Association
S. Makhaye	Institute of Natural Resources
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S. Dlamini	Durban City Health Department
G. Makoena	University of Natal
Z. Nkosi	University of Natal
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L. Miya	University of Natal
Z. Msane	University of Natal
M. Cele	Zihlahla Zemithi
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Financial support for the case study was given by the Department of Environment Affairs and Tourism (with the funds administered by the Human Sciences Research Council in South Africa), the Food and Agriculture Organization of the United Nations, and the City of Durban

3. METHODOLOGY

Geographic location

The indigenous medicine plant markets in KwaZulu-Natal are distributed throughout the province in both rural and urban areas. The project, however, focused in the urban markets in the Durban region due to their large size and the need for a cost-effective approach. The Durban market is also a regional clearing house for medicinal plants in KwaZulu-Natal, South Africa and its neighbouring states (including Mozambique, Lesotho, Swaziland and Namibia) (Figure 1.1). In addition, the population of Durban (some 4 million) accounts for some 50% of the total population in KwaZulu-Natal and therefore constitutes a representative site for a case study.

The case study time schedule

The field work took place during the course of 1996, and analysis of data and writing in 1997. Despite the Institute of Natural Resources being active in this field for the last decade, and having extensive experience in this field, the time taken to carry out the survey was considerable. The need to develop credibility with all the market participants was a lengthy process requiring regular meetings and discussions.

The need to develop credibility amongst the role players

The market players in the medicinal plant trade were regularly raided by conservation authorities in the past as many of the plants traded were, and still are, protected or specially protected species. The confrontation between conservation authorities and the traders created suspicion and distrust between the market players and any outsiders, including researchers. The market survey had to develop the credibility of the researchers before any work in the markets could take place. In addition, for the findings of the survey to be acknowledged and used by the market, the project needed to develop ownership of the survey amongst market participants.

Developing credibility frequently required getting involved with issues not directly associated with the survey. Commitment by the researcher to the role players' interests served to develop the markets' commitment to the project, facilitating the research. As most of the research was based on perspectives and opinion, it was essential to gain the best support possible to ensure that the information collected would be factually correct.

The development of trust and ownership of the survey took eight months of regular meetings and communication to establish. Links were developed with a key traders' organization, a healers' organization, and a union which represents some of the market players. Numerous public meeting were also held at market sites to inform market players of the survey and its objectives. The survey strategy was to develop support for enabling the survey to take place, and to obtain accurate information. One of the approaches adopted was to encourage the various organizations to adopt the survey as a tool for them to use in improving their business opportunities and personal welfare. Leadership had to be shown that information of the markets gave them power to influence the market environment.

Developing project ownership amongst the market players

The advantage of this approach was that the leadership recognized the value of information and consequently adopted the survey as an initiative of their respective organizations. Consequently at public meetings or organization membership meetings, the project was frequently referred to by the respective leadership as 'their project' and that the researchers were 'working for the organization'. The researchers had to do little convincing of the membership to participate in the survey due to the active support of leadership.

This approach was however costly in time and resources but was essential to gain access to the markets and to obtain factually correct and accurate information.

Collection of quantitative data in the market

The market survey was based on both questionnaires and market observations. Several key groups were identified and targeted for the survey, and included:

- street traders and gatherers,
- indigenous healers,
- shop traders and wholesalers,
- indigenous healers' patients,
- clinic patients (the general public from the same sector of the population), and
- various health and conservation authorities.

As most of the market is informal, and the more formalized traders keep few or no records of transactions, the study was not able to utilize any business data, but had to capture information which traders had internalized. The questionnaires were conducted as interviews as many of the market players are illiterate.

Four questionnaires were designed to capture information about the supply and demand of medicinal plants, by focusing on the expertise of various key market players. For example, plant gatherers were questioned intensively about the source and supply of wild plants as they are the major harvesters of the resource. The questionnaires were designed after discussions with various role players to refine approaches and to answer specific questions that discussions had identified as priorities. While the questionnaires focused on nine species of high value plants, there were also general questions that were designed to capture broader market information. The interviews took between 15 minutes and 60 minutes to complete, and were generally carried out by Zulu speakers who were also proficient in English.

The major challenge in this study was to develop an understanding of the quantitative characteristics in a market where there was little or no recorded trade information. Due to the lack of any recorded quantitative data, the questionnaires were designed to capture as much quantitative information as possible for analysis to be undertaken. Prior to this study, there had been considerable speculation regarding the levels of plant use, with no indication of the levels of use. Cunningham [1988] undertook a major survey with shop traders, but this did not attempt to estimate the total volume of trade for the entire market, and focused on shop trade.

In designing the questionnaires it was important to use a number of questions to enable quantitative assessment to be made. The survey attempted to capture the frequency of use/sale, the quantities used/sold, and the price of the product sold. For example, to determine how much plant material of a certain species was traded, the questionnaire respondents had to estimate how many times a day the product was sold, the mass per traded item was then weighed, and the price recorded. These traded amounts were then annualized and aggregated for the numbers of market players in similar situations, enabling a gross estimate of quantities traded to be made.

Several approaches were used in undertaking the interviews. The street markets were visited on a pre-arranged day and the survey was completed within a day. Two street markets were surveyed, and a total of 189 half-hour questionnaires were completed.

The indigenous healers were interviewed either at their practices or at meetings where several healers were gathered. These questionnaires generally took approximately 45 minutes to complete and 41 healers were interviewed. This group was particularly difficult to interview as many healers were reluctant to commit time to the interview. There was also considerable suspicion by the healers that the information may be used by other people to make money from their knowledge. This aspect of the

survey was time intensive requiring considerable introductory discussions prior to any interviews taking place.

Shop traders and a wholesale company (only one wholesaler functions in KwaZulu-Natal) were interviewed at their shops and each interview took approximately 60 minutes to complete. The sample in this group was limited due to time constraints of the project and after seven interviews it became clear that the traders operated in a similar pattern. It was felt that the sample provided a good reflection of traders as a whole. However, further information would be useful as different prices are charged for products in smaller towns.

The patients at the indigenous healers' practices and at western medical clinics were surveyed. Ninety-one patients were interviewed at the healers' practices to try to develop an understanding of the use of indigenous medicine. These patients were mostly women who had brought their children to the healers on specific 'baby' days and would wait in lengthy queues. At the western medical clinics 104 patients were interviewed. The two localities were selected as both sites had long queues of patients waiting for attention, enabling the interviewers to have at least 15 minutes discussion with each respondent. This waiting period at the healers and clinics gave the study the opportunity to interview people who would otherwise not be willing to spend time talking about their use of healing systems. The patients at the clinics were used as a sample that would represent the broader publics' use of healing systems. The clinic sample could then be compared with the sample from the healers' practices.

A summary of the range and number of respondents is illustrated in Table 3.1, together with criteria for their selection and the average duration of the interviews.

Table 3.1: A summary of interviews undertaken

Respondents	Number of respondents	Selection criteria	Duration of interviews
Street traders and gatherers	189	Traders and willing to be interviewed	30 minutes
Indigenous healers	41	Healers willing to be interviewed	45 minutes
Healers' patients	91	People waiting in queues on busy days	15 minutes
Clinic patients	104	People waiting in queues on busy days	15 minutes
Shop traders	7	Traders and their leadership willing to be interviewed	60 minutes
Wholesaler	1	The only wholesaler in KwaZulu-Natal	120 minutes

The project had initially intended to interview much larger samples than indicated above. There were however several major constraints which resulted in the interviews and the time for the project being significantly curtailed. The intense suspicion required that numerous discussions take place to gain access to the interview sites. Even though the leadership of various organizations had made public statements in meetings within the markets regarding the value of the study and their support for the work, the survey frequently had to hold additional discussions with market participants to reiterate the survey objectives. This was not only to obtain data, but to ensure that the data were as reliable as possible, and to ensure the safety of the interviewers in the field. The threat of physical violence was present at times and on several occasions field work had to be terminated due to strenuous objections from antagonistic traders. An additional mechanism that was used to diffuse tense situations, was to employ a committee member of a regional healers' organization as a team member, who would frequently be called upon, during the course of interviews, to placate objectors.

Apart from for the above suspicion, Zulu culture does not accept concise conversations as being socially acceptable. Discussions were generally protracted, with conversations taking place before key issues were discussed. It is considered culturally unacceptable to get straight to the point, and also not acceptable to have any discussion about a person's private business (work or personal) without the respondent having a clear understanding of the work being undertaken. In addition, when the respondent wished to discuss some associated issue with the interviewers, these discussions had to be

completed before continuing with the questionnaire. Failure to allow the respondents to ask their own questions of the work being undertaken, and have them adequately answered, would be considered socially unacceptable, and would likely result in the respondent not wanting to continue with the discussion as it would be perceived as merely a one-way process. The concise approach usually used by market survey workers was therefore not appropriate to the culture of the market players. A questionnaire which under more formal market circumstances would take 10 minutes took between 20 to 30 minutes to complete depending on how much feedback the respondents wanted.

Data coding

The information in the questionnaires was coded. All the variables for the answers were listed and given a number (code). A dictionary was produced which lists the questions, and each of the responses to the questions and their codes. The dictionary is an important tool in the analysis as it allows the researcher quick reference to the data without having to return to the individual questionnaires to find out what the responses were. These codes were then placed in a spread sheet.

Data analysing

QuattroPro (6.0) (Novell Inc.) was used to analyse the data and produce either graphs or statistical analysis.

Collection of qualitative market information

Apart from collecting data through questionnaires, an important part of the survey was to make observations during the course of the work. The researcher took notes during formal and informal discussions, at public meetings and during field work. This helped to provide insights into the market which were not possible to obtain from the structured interviews. Several lengthy unstructured interviews were also undertaken with various market players and helped to provide a depth of detail not obtainable from the structured questionnaires. These observations were particularly important during the initial stages of the survey as they helped focus the study and provided insights into the design of the questionnaires and the approaches for the survey.

More discussions and observations could have reduced the numbers of questions that were placed in the questionnaires making the entire process of data capture, coding and analysis more efficient.

4. DEMAND FOR MEDICINAL PLANTS IN KWAZULU-NATAL

Medicinal plants are used extensively by the black population throughout KwaZulu-Natal (KZN), and indeed South Africa. An active trade and market in medicinal plant material occurs in KwaZulu-Natal as a result of:

- a fragmented distribution of medicinal plant species due to the varied land use, topography and climate in the region,
- large spatial concentrations of consumer demand as more than half the province's population is concentrated in two urban centres,
- local extinctions of plants and the need to access more remote plant populations due to intensive harvesting, and
- various socio-economic factors (including culture and accessible health care) which maintain and stimulate demand.

In KwaZulu-Natal over 400 plants are actively traded [Cunningham 1988; McKean 1996] with an estimated trade volume of some 4 300 tonnes[1] per year. As the market is large and dynamic, several

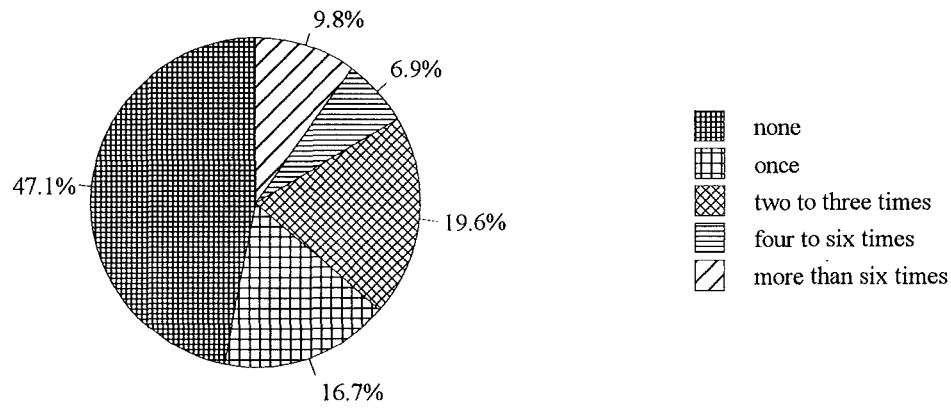
[1] This estimate includes both dried products, such as bark and 'wet' products such as bulbs and live plants.

market segments have developed in response to the users' demands and the supply of plants. The extent of trade and the market segments are discussed in the following sections[2].

4.1 Quantity and trends in consumer demand

A survey of several Durban City medical clinics indicated that 53% of the black clinic patients made use of indigenous[3] healers at least once during the previous year, with an average of 3.34 visits in the previous year (see Figure 4.1).

Figure 4.1 : The number of times which clinic patients visited an indigenous healer in 1995



While respondents asked whether they visited a indigenous healer in the previous year, the survey omitted to ask respondents whether they purchased indigenous medicine without a healer's prescription. As a consequence, the above estimate of indigenous medicine use may be an underestimate. An indication of the extent of self-medication can be obtained from the expressed preference for hygienically packed medicines. Eighty-four percent of the black clinic patients indicated that they would prefer more hygienically packed indigenous medicines, indicating that 31% of the sample may not have visited an indigenous healer in 1995 but probably make use of indigenous medicine (see Figure 4.2).

Assuming that the clinic sample is representative of the black population in Durban[4], the total number of users is estimated to be around 2 million people [that is 84% of 2.442 million blacks resident in Durban (Durban Metropolitan Government 1996)]. This estimate can be considered a conservative minimum level, as 6% of the indigenous healers patients indicated that they did not make use of western clinics, and therefore using the clinic patients as a proxy for the Durban black population may be a slight underestimate.

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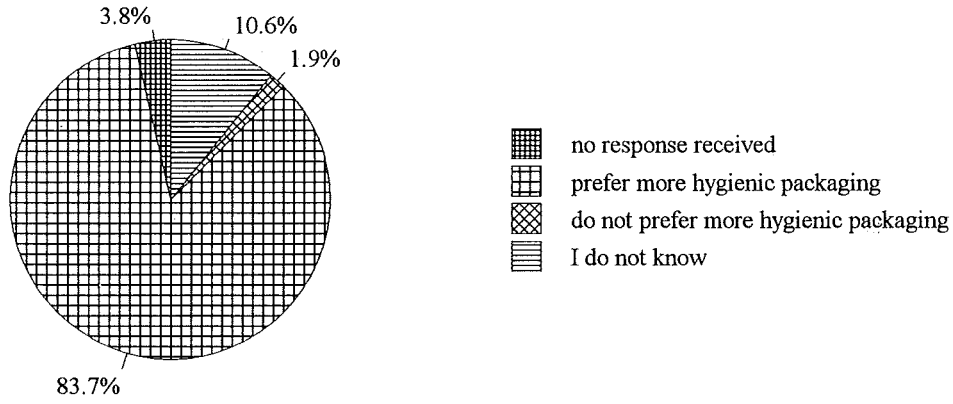
2 This survey has focused on the markets in Durban. However, some estimates are made of regional and national patterns, and these are derived by using the Durban survey as a proxy.

3 The term indigenous healers or medicine is preferred by the author to the more conventional term traditional healers or medicine. The healing practices used, while originating in African culture, are not purely traditional. The practice is dynamic, addressing new illnesses like AIDS, and adopts new technologies and new medicines. The healers also deal with all manner of urban social problems, which are not traditional. The term indigenous medicine may therefore be more appropriate as it relates to the practices of healing and divination within an indigenous but modern African culture which may not necessarily be traditional.

4 Durban refers to the Durban functional region, which is larger than the city's administrative boundaries, and includes neighbouring communities which are essentially part of the city's economy.

Figure 4.2 : The demand for hygienically packed indigenous medicines



4.1.1 The quantity of plant material reported to be consumed

Basing the quantity demanded on the reported number of times which the population sample visits indigenous healers (3.34 times per annum), it is estimated that between 900 tonnes and 1 500 tonnes of plant material were consumed in Durban in 1995 (see Appendix 1 for the model used to estimate the quantities traded)[5].

This estimate assumes that the indigenous medicine users not visiting indigenous healers, that is the remaining 31% of users, would use indigenous medicine at the same rate at which healers are visited (3.34 times a year). The estimate of 900 tonnes is derived if 53% of the population is assumed to use medicine at an average mass of 83.3g per use (the average mass of plant material prescribed by healers and shop traders) and the remaining consumers use the medicine at 216.5g per use (the average mass of plant material traded in the street markets). The estimate of 1 500 tonnes is obtained if all 84% of the black population uses medicine at 216.5g per use. This last estimate is likely to be more realistic given the extent of wastage associated with the poor storage of plant material.

4.1.2 The quantity of plant material reported to be traded

The shop traders are estimated to trade 340 tonnes per year, with approximately 50% reported to be purchased directly from plant gatherers (170 tonnes) and the remaining 50% purchased from street traders (170 tonnes) (see Information Box 4.1).

The quantities traded by the healers was problematic to estimate due to the unknown number of healers in the survey area. Various reports [Holdstock 1978; Gelfand 1985; Cunningham 1988] had been made regarding the ratio of indigenous healers to the population but these have not been used for a number of reasons. Firstly, the mode of operation differs considerably between healers, with some healers being extremely busy whilst others may only practise part-time. Secondly, the various healers' organizations have provided a rough indications of the number of healers which are registered with them, but it has not been possible to obtain membership lists from these groups (in addition, the membership makes no differentiation regarding the nature of the practitioners operation, that is, whether it is either full-time or part-time).

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[5] As most of the estimates are based on relatively imprecise data regarding the numbers of market participants, the broad estimates will generally be rounded off to make for easier reading. However, detailed measurements made within the survey will be retained for descriptive accuracy and where calculations are made.

INFORMATION BOX 4.1

The approaches used to calculate quantity traded have had to make use of whatever information could be obtained from the various market players. As various market players differ considerably in their mode of operation, the approach used has had to adapt accordingly. Consequently, the method used to determine the volumes traded in each sector differs and is detailed below for clarity.

Approach Used to Calculate the Quantity of Medicinal Plants Sold by Shop Traders in Durban		
Average number of customers per trader per day	[A]	192.86
Average number of customers per trader per year	[B] = [A × 276 days]	53 229
Average value per sale per customer	[C]	US$ 0.7[19] [R 3.18]
Average annual income per trader	[D] = [B × C]	US$ 37 528 [R 169 191]
Average price per kilogram for products sold	[E]	US$ 5.41 [R 25.25]
Average annual quantity traded in kilogram	[F] = [D ÷ E]	6 700.63
Total number of shop traders in Durban[1]	[G]	51
Total quantity traded by shop traders in Durban	[H] = [G × F]	341 tonnes

[1]Based on estimates by Cunningham 1988.

Due to the above problems, estimates are based on the visitation frequency reported by the clinic patients and the average number of patients, which the indigenous healers indicate they may treat per day. Following this approach an estimated 936 tonnes of medicinal plants are traded per year by indigenous healers in Durban[7]. The indigenous healers reported that they purchase plant material from two sources, approximately 50% from the street markets and 50% directly from plant gatherers. This suggests that approximately 468 tonnes are bought from each group (see Information Box 4.2).

INFORMATION BOX 4.2

Approach Used to Calculate the Quantity of Medicinal Plants Dispensed by Indigenous Healers in Durban

Black population in the Durban region	[A]	2 442 000
Fraction of black population visiting healers annually	[B]	0.53
Total number of people visiting healers in a year	[C] = [A × B]	1 294 260
Average number of visits to healers per patient per year	[D]	3.34
Total number of visits to healers per year	[E] = [C × D]	4 323 824
Average mass of a dispensed dosage (in grams)	[F]	216.5g
Total mass used by healers in Durban (in 1995)	[G] = [E × F]	936 tonnes

Estimates of the street trade volumes in Durban, as reported by the street traders in terms of the number of sacks of plant material sold per week, indicate that some 1 100 tonnes may be traded per year (see Information Box 4.3).

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7 This estimate uses an average mass of 216.5 g for a prescribed medicine dosage. This mass is the average mass of street traded products and is believed to be a more appropriate mass than the mass dispensed in traders shops and by healers (an average 83.3 g) for estimating the quantity used by healers. The traded products are generally unprocessed and poorly packaged, with a significant proportion (not quantifiable at present) of the plant material spoiled in the transportation and storage process. The author therefore considers the larger street traded mass to be a more accurate reflection of the quantities which healers will utilise but not necessarily dispense.

9 An exchange rate of SA Rands 4.5 : US$ 1 is used in the report (in 1996 prices).

INFORMATION BOX 4.3 Approach Used to Calculate the Quantity of Medicinal Plants Sold by Street Traders in Durban		
Average number of sacks sold per trader per month	[A]	9.8
Average mass per sack (kg)	[B]	24 kg
Average mass of plant material traded per month	[C] = [A × B]	235 kg
Average annual mass traded by street traders	[D] = [C × 12]	2 820 kg
Average number of street traders in Durban markets	[E]	380
Total quantity traded by street markets	[F] = [D × E]	1 070 tonnes

Of the plant mass traded in the street markets, an estimated 20% of the trade or 220 tonnes, is reported to be traded between the street traders themselves and not to consumers, healers or shop traders. This implies that of the 1 100 tonnes traded in the market as a whole, only 880 tonnes of plant material is the physical stock of plants entering the street markets in a year (see Information Box 4.4).

By summing the quantities sold by the various market players to end consumers, it is estimated that some 1 500 tonnes of plant material were sold in the Durban markets in 1996 (see Information Box 4.4).

This estimate of 1 500 tonnes traded in the market approximates the estimate derived in 4.1.1 regarding the maximum quantity of plant material which may be consumed in Durban given the consumption rates of the clinic patients interviewed. While the two approaches are not entirely independent as both models use a common number in estimating the use associated with healers, there is sufficiently different information in the other sectors which gives confidence to the similarity of estimates.

INFORMATION BOX 4.4 Approach Used to Calculate the Total Quantity of Medicinal Plants Traded in Durban Markets		
Total quantity of plants traded in street markets	[A]	1100 tonnes
Quantity of plants traded between street market players (20% of total trade)	[B]	220 tonnes
Total physical stock of plants **leaving** the street market	[C] = [A - B]	880 tonnes
Quantity of plants bought by healers from the street market (936 tonnes less 50%)	[D]	468 tonnes
Quantity of plants bought by shop traders from the street market (341 tonnes less 50%)	[E]	171 tonnes
Quantity of plants bought by end consumers from street traders	[F] = [C - [D + E]]	327 tonnes
Quantity of plants sold to end consumers by healers	[G]	936 tonnes
Quantity of plants sold to end consumers by shop traders (total less approximately 25% sold to healers)	[H] = [341 tonnes × 0.75]	256 tonnes
Total quantity of plants consumed in Durban (quantities sold to end consumers by street traders, healers and shop traders)	[I] = [F + G + H]	1 519 tonnes

4.1.3 Potential provincial and national consumption levels

Several studies in different geographic localities throughout South Africa and in different cultural groups have shown that between 58 and 100% of the black population uses indigenous medicine. Holdstock [1978] estimated that between 80 and 85% of the black population in Soweto (a black township in Johannesburg) consumed indigenous medicine. Ellis [1986] found that 100% of a random sample of hospital patients in the Estcourt area (a typical rural population) used indigenous medicine. More recently, a study in peri-urban Bushbuckridge [Mander 1997a] estimated that 58% of the clinic patients used indigenous medicine. However, this estimate is known to be conservative due to the persecution of people suspected of witchcraft in the area, and consequently an unwillingness to admit to the use of indigenous medicine. Assuming that the characteristics of the Durban consumers are representative of the rest of the population in KwaZulu-Natal and South Africa, it is possible to provide a preliminary indication of provincial and national consumption patterns.

In KwaZulu-Natal the current population is estimated to be 8.7 million, with the black population comprising 83% of the total population or 7.2 million people [Central Statistical Services 1996]. Assuming that 84% of the black population use indigenous medicine in KwaZulu-Natal, the number of potential users of indigenous medicine could therefore be 6 million people. Based on an average frequency of uses of 3.34 visits/uses per year (this translates to 20 million uses a year), and assuming an average mass of 216.5g per use, then total quantity of medicinal plants used in KwaZulu-Natal could amount to 4 339 tonnes per year.

Similarly, at a national level there are 33 million blacks in South Africa [Central Statistical Services 1996] with an estimated 28 million (84%) users. Using the same visitation rate per year and the mass per use as above, the total national consumption could amount some 90 million uses per year with a mass of 19 500 tonnes of plant material.

4.1.4 Trends in the use of indigenous medicine

The survey of consumer trends at western clinics and at indigenous healers indicated that a large section of the population has not changed their use patterns, with similar percentages indicating both an increase and a decrease in use. There is, however, an overall increase in the use of indigenous medicine. The following figures (4.3 to 4.8) and discussion outline the changes and reasons for change in use frequency cited by healers and clinic patients.

Figure 4.3 : The reported changes in use by indigenous healers' patients

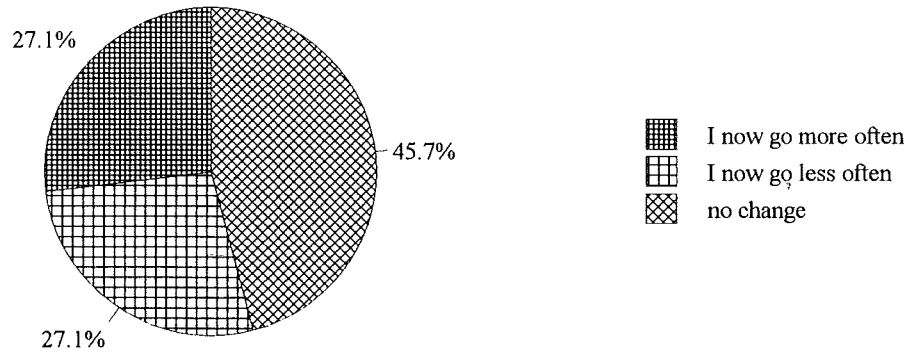


Figure 4.4 : Healers patients' reasons for a change in the frequency of indigenous medicine use

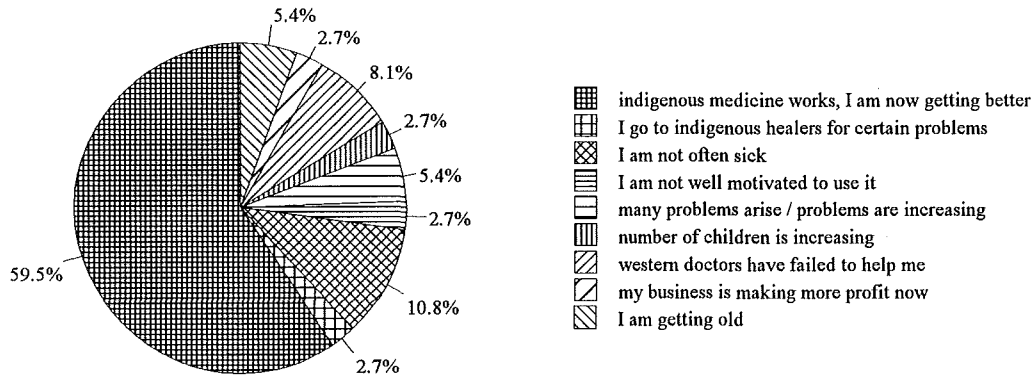


Figure 4.5 : The reported changes in use by western clinic patients

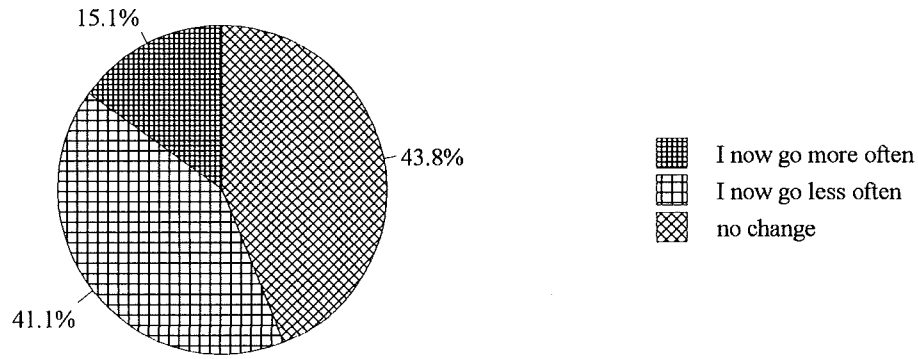


Figure 4.6 : Clinic patients' reasons for a change in the frequency of indigenous medicine use

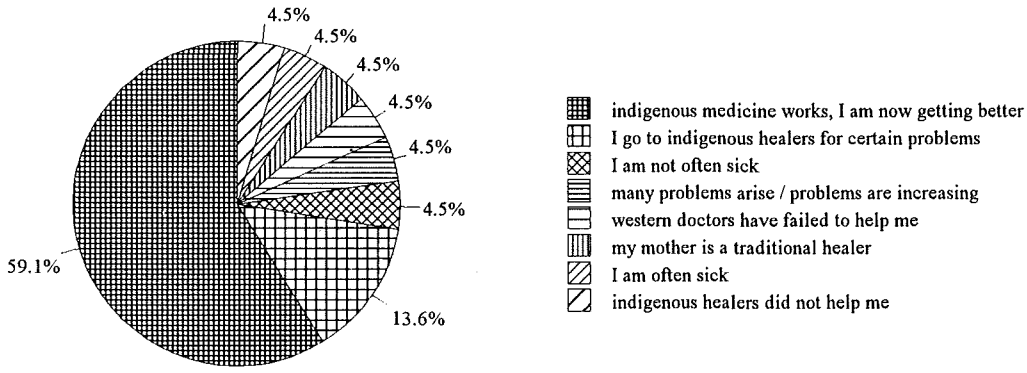


Figure 4.7 : The future use of indigenous medicines as reported by western clinic customers

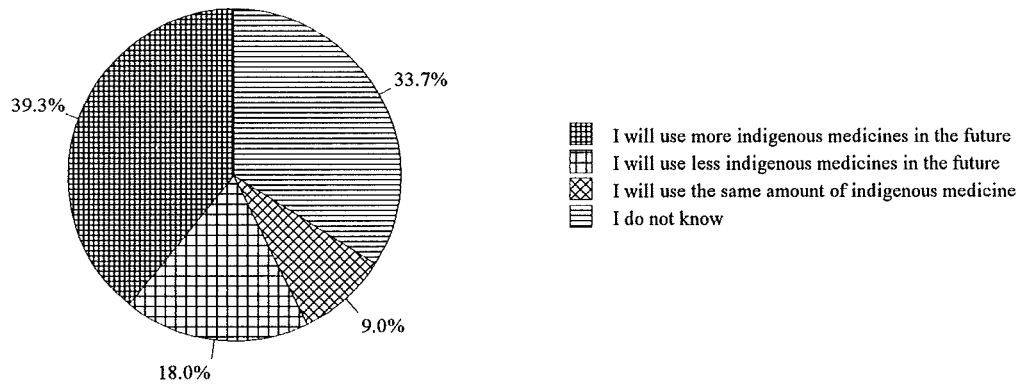
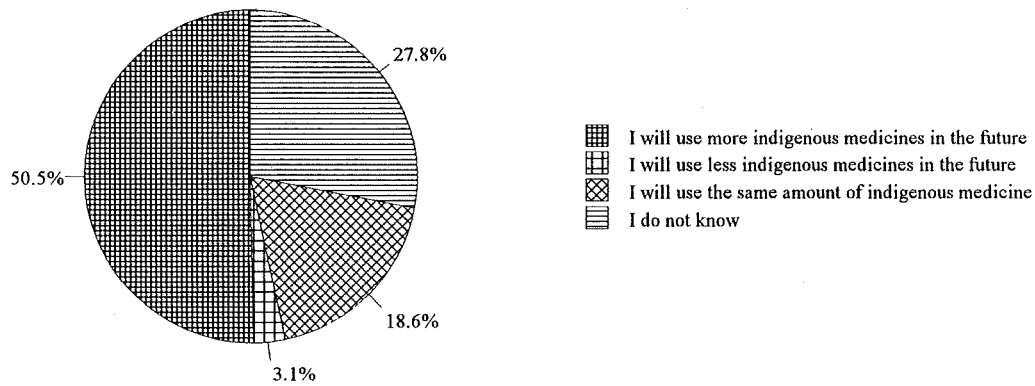


Figure 4.8 : The future use of indigenous medicines as reported by indigenous healers' customers



Figures 4.3 to 4.8 indicate that there is a considerable proportion in each group of consumers that continue to make use of indigenous medicines as before. However, of the clinic patients, 2.7 times more patients indicated a decline in their use than an increase in use. The healers' patients on the other hand indicated an equal increase and decrease in use. In contrast to the above, both groups of consumers anticipated a greater increase in future use of indigenous medicine than a decrease in use There were 47% more healers' customers and 19% more clinic patients who anticipated that they would increase their frequency of use in the future than those patients who anticipated a decline in the use of indigenous medicine.

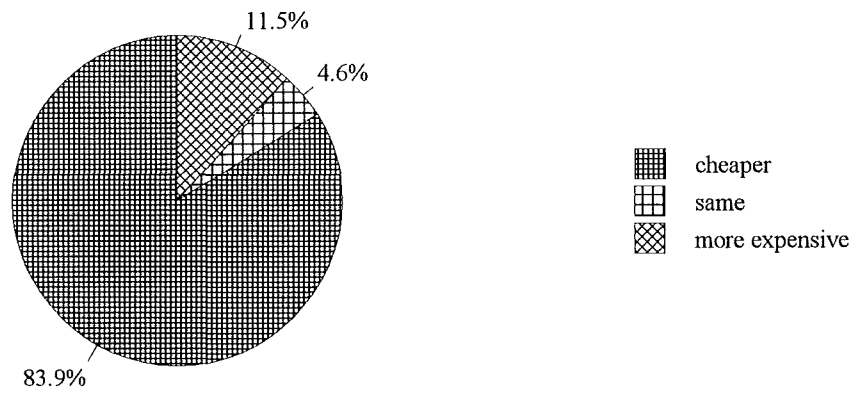
Of the indigenous healers interviewed, 90% believed that the demand for indigenous medicine would remain high. The shop traders shared the same perspective that trade would remain at high levels.

Discussions with market players and observations of the markets in southern Africa (South Africa, Mozambique, Swaziland, Lesotho and Namibia) have pointed to an increase in the demand for medicines [Scott *pers. comm.* 1996; Maseko *pers. comm.* 1997]. While the individual consumers surveyed may not have indicated a trend of increasing use, there is common consensus among traders and researchers that there has been an increase in the number of individuals consuming indigenous medicine. This may be the result of the following factors.

- The population growth throughout the region is around 2.4% per year [Central Statistics 1996], leading to an increase in the potential number of people who may make use of indigenous medicine. Coupled with this increase, are the accelerated urbanization rates, which increase the competition for resources and services, especially where economic growth lags behind population growth. Indigenous medicines are actively used to reduce competition for employment, housing, and other social resources that are associated with increasing urban competition. Competition in urban areas may also contribute to psychological stress, and indigenous healing and healers are used extensively to treat stress-related illness.

- The existence of poverty also fuels the demand for medicinal plants as households are forced to make use of affordable medicine. While consulting a healer may be more expensive than visiting a clinic (see Figure 4.9), medicines bought directly from the street traders are much cheaper than any other forms of health care, and consequently are an important health care option.

Figure 4.9 : The cost of visiting a clinic versus an indigenous healer as reported by healers' patients



- Past government policies in South Africa discriminated against indigenous healing, giving it no positive recognition, and generally labelling the activities as primitive and even legislating against witchcraft practices (Suppression of Witchcraft Act). Perceptions are now changing from several quarters, with increasing official and societal recognition. For example, medical aids in South Africa are increasingly accepting claims, by their members, for visits to indigenous healers [Daily News, 14 January 1997], and black people themselves are developing increasing pride in the culture of indigenous healing.

- One of the greatest drivers of the demand for indigenous medicine are the widely held views by the black community that certain illnesses are 'cultural' sicknesses which can only be treated by indigenous medicine. In addition, AIDS is rapidly increasing within the South African community, and with little relief from western medicine, healers report that people with AIDS consult them. There are many healers who now advertise that they have a cure for AIDS, promoting the increased use of indigenous medicine.

- Apart from the above, the remote geographical location of many large rural populations also promotes the use of indigenous medicine as it is usually the most accessible source of health care, and the most available health care, as western clinics are either far away or visit rural communities only periodically.

In view of the above factors, the local demand for indigenous medicine is unlikely to decline and will probably increase as the population increases.

Apart from growing local demand, there are also indications of a growing international demand. Neighbouring countries (particularly Namibia and Botswana) are increasing their demand for South African medicinal plants due to the greater diversity, reliability of supply and quantities available. The dry environments have relatively low diversities of high value medicinal plants and in addition, the frequent and regular movement of people between southern African states results in considerable exchange in ideas and information, with foreign healers learning to use South African products. In addition, the declining ability of many countries to maintain the importation of synthetic drugs promotes the continued use of indigenous medicines[8]. International demand for local plant products is also likely to increase with the growing popularity of alternative medicines and natural products in developed countries [Lange 1997].

4.2 Market segments

Two major market segments, direct consumers and patients of indigenous healers, characterize the market for medicinal plants in KwaZulu-Natal. A third market segment is the pharmaceutical companies, but it is a minor market player at present (see Section 4.2.2).

The discussion will focus on the findings for Durban and will make projections for KwaZulu-Natal where appropriate.

4.2.1 Direct consumers and the indigenous healers' patients

This market segment represents those consumers who purchase medicinal products for self-medication from street markets, shops, rural markets, and healers' practices and/or who purchase prescribed medicines from indigenous healers.

The survey was not able to interview direct consumers in the street markets and shops[9]. Nevertheless, observations by the researcher and sales persons in the trade indicated that direct consumers and healers patients came from all socio-economic strata in the black community. Due to the survey limitations and the similarity between the two key market segments, the two market segments will be discussed together with differences indicated where they arise.

4.2.1.1 The buyers - who are they

The majority of users of indigenous African medicine in Durban, and for most of South Africa, are black. They represent a diverse group, with a wide range of social and economic characteristics. A number of figures are presented to indicate the range of consumer characteristics amongst the indigenous medicine users[10]. At present there is limited use of indigenous medicinal plants by other population groups in South Africa.

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[8] For example, discussions in 1996 with women from a remote area in western Mali, reported to the author that they did not bother travelling to the local clinic, in this case only a few kilometres away, as the only medicine which the clinic could provide was quinine and aspirin, and good alternatives for these drugs were more easily accessible in the bush close to where they lived.

[9] The survey was not able to make an assessment of the consumers from street markets and herb shops. The fast nature of transactions and the general pace of activity in the market did not make interviews possible. While sales persons were asked about consumer characteristics, the information obtained was not suitable for detailed analysis as it was based on general impressions. With these limitations, no distinction will be made between the characteristics of the direct consumers (those buying for self-medication) and the healers patients. The report therefore uses the healers' patients as a proxy for the all the indigenous medicine consumers. Some information from the clinic patients is used where appropriate.

[10] This has important implications for the market potential as this study has shown that there is currently little or no differentiation in the products marketed (Section 7.1) while there are considerable differences in amongst the consumers.

Photo 2: A typical stall at Mona market trading raw products. Note the range of plant products, from large plant pieces to the processed material in bags, indicating that they trade to both bulk buyers and consumers.

Photo 3: The Russel Street medicinal market in Durban, South Africa - one of the larger indigenous medicine markets in Africa, with over 300 stalls and 500 traders.

A survey of black clinic patients within Durban indicated that some 53% of the respondents visited indigenous healers in the last year and a further 31% may use indigenous medicine but did not visit healers in the previous year (see Figures 4.1 and 4.2). Assuming that the clinic sample represents the black population in Durban[11], then some 1.3 million people may make use of healers every year, with an additional 760 000 people using indigenous medicine without going to a healer, that is, probably purchasing products directly from traders. In total there are approximately 2 million indigenous medicine consumers in Durban, and at a provincial level, basing the estimates on the Durban statistics, there may be some 6 million consumers in KwaZulu-Natal[12], and 27 million in South Africa.

The general characteristics of the buyers are illustrated in figures 4.10 to 4.16.

It is interesting to note that the age-class distribution for the sample tends to mirror the age class distribution for the population as a whole [Durban Metropolitan Government 1996], indicating a broad spectrum of use (see Figure 4.10). One expects that the use of healers would be greater in the older age classes of black society which are more traditional. This is not evident in the study.

Figure 4.10 : An indication of the age of healers' patients

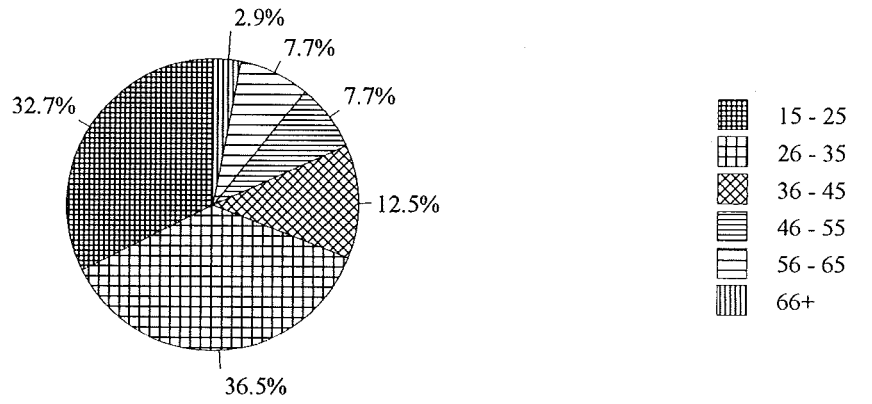

Figure 4.11 shows that slightly more females than males are visiting indigenous healers but the difference is insignificant[13]

The education category distribution is similar to that recorded for the Durban region [Development Bank of Southern Africa 1994] and indicates that the sample selected is a relatively accurate representation of the Durban population (see Figure 4.12). Past speculation has predicted that low education levels would be strongly correlated to the use of indigenous medicine. However,

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11 This assumption is valid as the socio-economic characteristics of the clinic patients are similar to that described by broader studies [Durban Metropolitan Government 1996] of the black population in the Durban region.

12 This is likely to be a conservative estimate given that some 50% of the population of KwaZulu-Natal is rural, and their frequency of indigenous medicine use is likely to be greater than the urban areas given the limited access to western bio-medical services in remote regions. This is likely to be the case for South Africa as a whole which has similar urban/rural population split.

13 The sample used in Figure 4.11 is from the clinic patients as the indigenous healers sample was biased towards females on the days on which the survey was carried out. The survey was undertaken on days when large numbers of patients visited the healers focusing on the treatment of children. Hence the use of the Durban clinic sample as a more representative sample of the user population.

Figure 4.12 indicates that over 60% of the consumers have at least some form of secondary education. Higher education levels do not appear to result in a reduction in the consumption of indigenous medicine.

Figure 4.11 : The gender of clinic patients reported to use healers

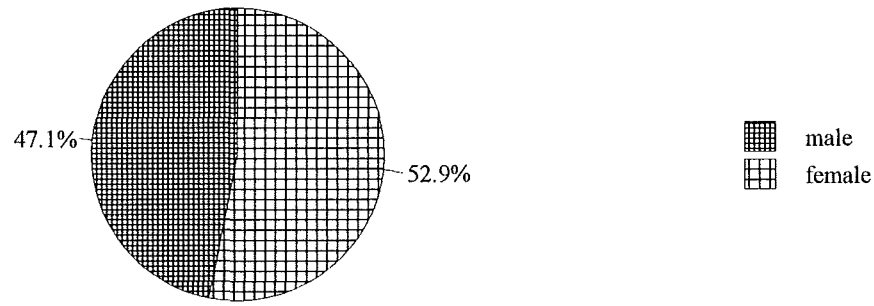
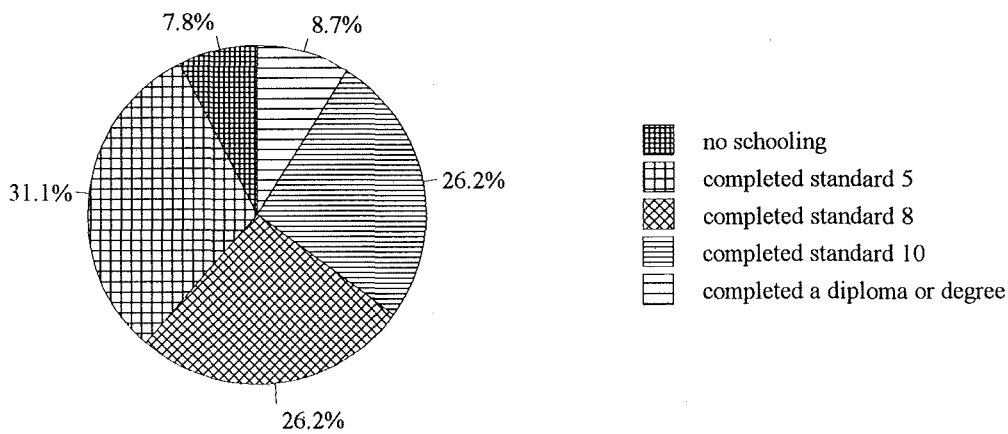


Figure 4.12 : The education level of healers' patients



One may also expect that certain religious affiliations are likely to influence the use of indigenous medicine, given the magic and ancestral worship associated with its use. The survey indicates that 96% of the consumers had a Christian affiliation (see Figure 4.13).

A broad spectrum of occupational classes are represented in the survey sample (see Figure 4.14). What is clear that the use of indigenous medicine is not confined to the lower earning occupations. This is confirmed in the figure illustrating the wide range of incomes earned by the consumers' household (see Figure 4.15).

Figure 4.13 : Religious affiliations of the healers' patients

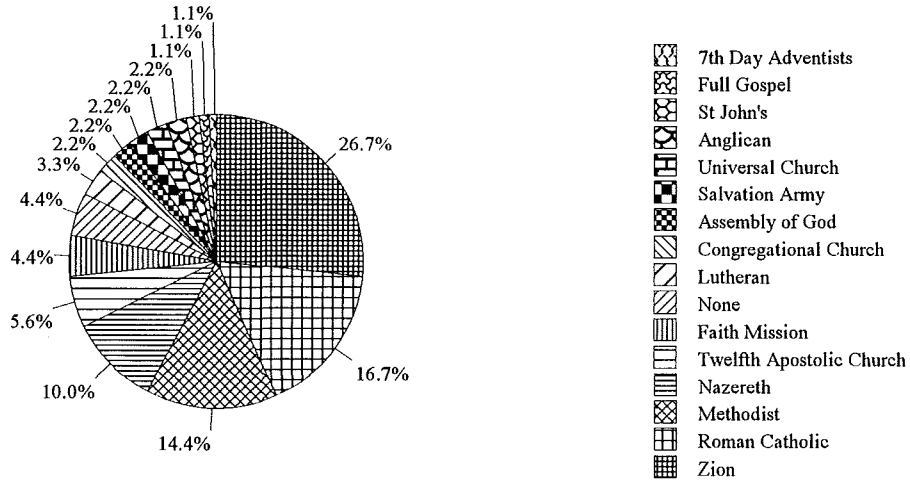


Figure 4.14 : The occupation of healers' patients

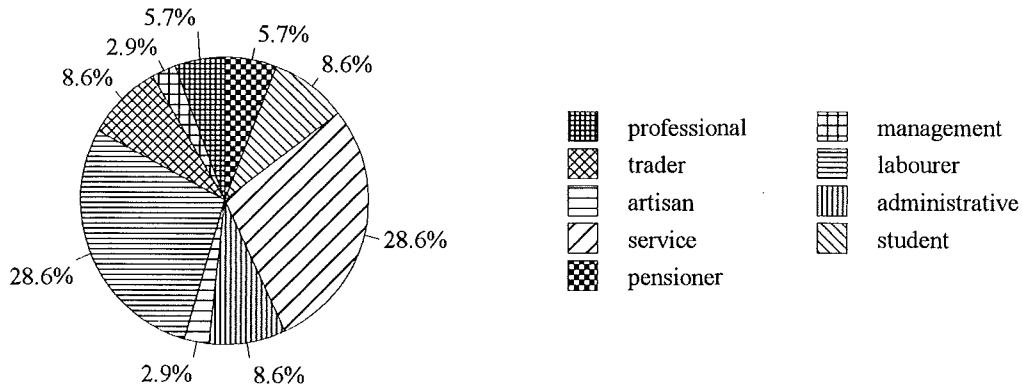


Figure 4.15 : Household's incomes

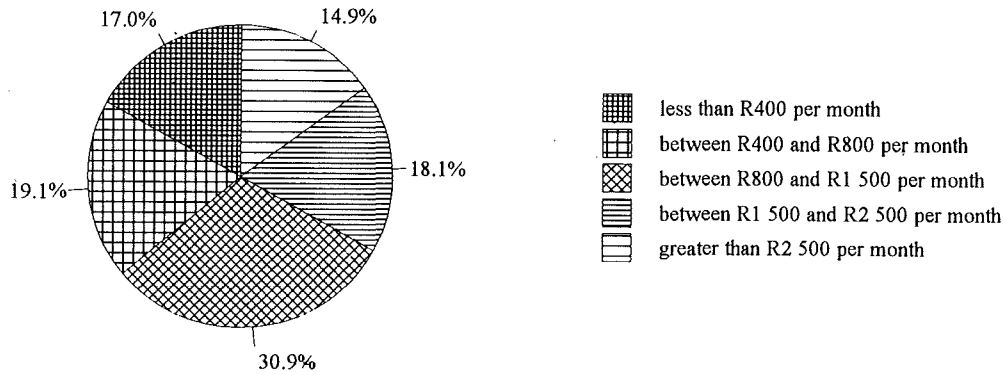
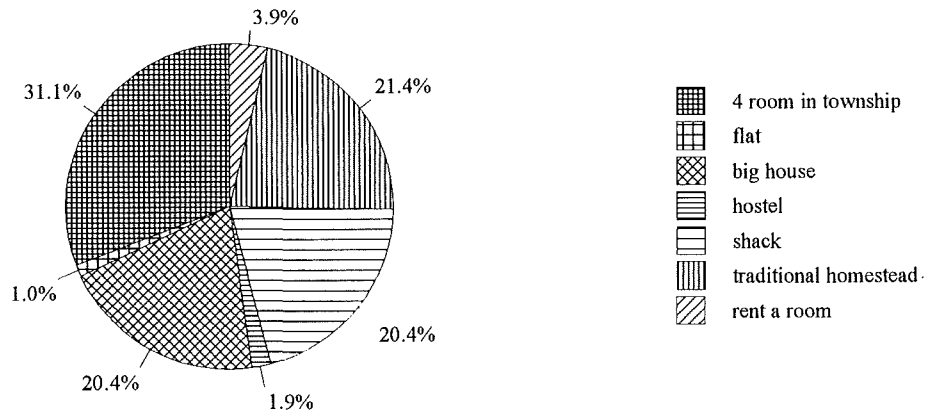


Figure 4.16 confirms the wide range of the people that make use of indigenous medicine. The range includes, people from conservative traditional backgrounds (the traditional homesteads), relatively wealthy people (big houses), average people (4-roomed house), recent migrants to the city, new families, and people affected by political violence (the shacks), and single people and poor people (the hostels and rented rooms). The diversity in the types of homes which consumers live in provides an indication of the diversity of social and economic backgrounds of the users.

The above discussion shows that the majority of the black population in Durban is making use of indigenous medicine irrespective of religion, age, education and economic status. The direct consumers and the healers patients represent a large consumer population with considerable socio-economic diversity within the group. This has important implications for the market's development.

Figure 4.16 : The type of house occupied by healers' patients



4.2.1.2 The products purchased

The products consumed are generally unrefined plant medicines with limited processing apart from grinding, chopping, and mixing. Raw plant material is frequently bought directly by consumers who may grind it themselves following instructions provided by the healers or traders. Plant products are taken as medicines in the following forms:

- infusions (chopped bark, leaves, seeds/fruit, stems, bulbs, rhizomes and roots steeped in water) which can be drunk, used as an emetic, or as an enema,
- concentrates (infusions where the water is boiled off concentrating the liquid) which are usually drunk,
- inhalants (plant parts or powdered parts burnt to produce smoke or boiled to produce steam) which is breathed in,
- powder (ground plant parts, usually tree bark, roots and leaves - usually burnt or raw) and which can be licked, used as snuff, bathed with, rubbed on to the skin, or implanted under the skin,
- poultices (fresh leaves of fleshy plants) applied to wounds, sores, and other skin ailments, and
- protective charms (live or dried plants) used for planting or scattering around the homestead.

4.2.1.3 The quantities demanded

The Durban survey estimated that some 1 500 tonnes of plant material was consumed per annum (see 4.1.2 for the discussion on estimates). The average mass per plant product bought in the street markets was 216.5g, and was 83g per product in the traders' shops. Observations in the street markets indicated that customers usually purchased one item in the street market, whereas in the traders' shops, customers tended to buy more than one product. The shop traders reported that the customers buy on

average 127.2g per visit or 1.5 items per visit. At the healers' practices, the customers purchased similar quantities to those traded by the shop traders but it was usually only one item per visit[14].

Photo 4: A typical street trader's stall showing both raw and semi-processed products being traded.

The indigenous healers' patients or customers[15] consumed some 61% of the market produce (936 tonnes), while the direct consumers bought 22% of the market produce from traders' shops (340 tonnes) and 17% from street traders (256 tonnes).

At a provincial level, the consumers demand approximately 4 339 tonnes a year and nationally some 19 500 tonnes may be consumed[16].

[14] The healers' patients did not select the quantity purchased but were prescribed a quantity by the dispensing healer. In addition, the item purchased was usually a mixture of various plant species (which is generally confidential information).

[15] Patients refers to someone who is prescribed a medicine, whereas a customer is someone who purchases a product from the healer's stock without a consultation.

[16] This estimate assumes that the remaining KwaZulu-Natal and South African black population has similar consumption patterns to blacks in Durban. This assumption is reasonable given that rural areas are likely to have higher consumption rates and that some of the other ethnic groups may not be inclined to consume indigenous medicine at the same rate as the Zulu-speaking people.

Photo 5: Two popular medicinal plants, Callilepis laureola or impila (the brown root) and Synaptolepis kirkii or uvuma-omhlophe (the white root), being sold in relatively large piles to other traders.

4.2.1.4 The timing of purchases

Consumers visited indigenous healers on average 3.34 times a year[17] and visited the markets towards end of the month when salaries were paid. Purchases of medicine were generally associated with doing other regular chores, such as travelling to work or going shopping. Visiting indigenous healers on the other hand usually involved a specific journey to the healer but with other activities attached.

Observations of the market, and interviews indicated that there was greater buying activity on Mondays, Fridays and particularly Saturdays. Limited purchasing took place on Sundays. The time of purchases from shops and the street was normally between 10h00 and 16h00 during weekdays and on Saturdays between 10h00 and 14h00. Patients visiting healers tended to follow similar weekly patterns, but started earlier in the day. Patients arrived at the healers' practices between 07h30 until about 16h00 during weekdays, and up to 13h00 on Saturdays.

Consumption of certain species was generally constant throughout the year with a small peak in demand for chest-related medicines during the winter months and a small peak for homestead blessing products at the end of the year. The climate in Durban is tropical and consequently has a limited winter peak for chest-related medicines. In contrast, healers and traders in colder regions have reported substantial increases in the demand for *Siphonochilus*, *Alepidea* and *Warburgia* during the winter months (June, July and August in southern Africa).

[17] This estimate is used to predict the visitation frequency of the entire user population (healers' patients and direct consumers) as the survey did not collect information on the frequency of indigenous medicine use (as opposed to the frequency of visiting a healer).

4.2.1.5 The reasons for purchasing indigenous medicine

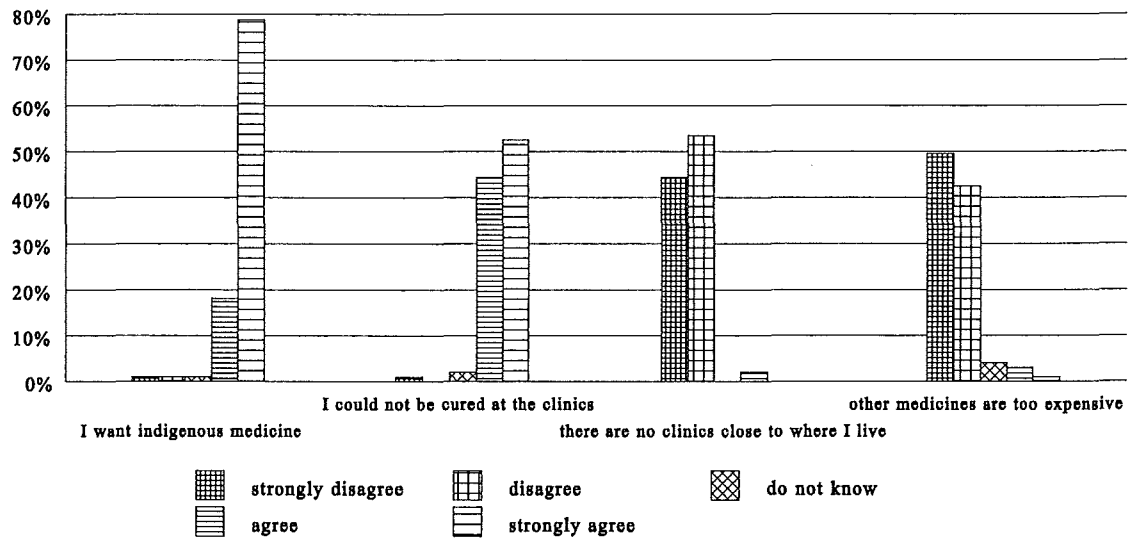
Consumers buy medicinal plants for a range of reasons as discussed in 4.1.4. Various experts and authorities have speculated that the high demand for indigenous medicine by the black population in South Africa is due to low income, poor education opportunities, high costs of western medicine, and the lack of clinics.

Some of these questions were posed in the survey and the results are illustrated in Figure 4.17.

An analysis of Figure 4.17 shows clearly the perspective that access to clinics and the cost of western medicines were not important considerations in determining the use of healers. On the other hand, strong sentiments were expressed regarding the desire for using indigenous health care systems and there was also strong support for the notion that clinics could not cure particular ailments. Respondents made it quite clear that the selection of healing systems depended on the type of illnesses or problems that they were experiencing. This indicates that in many cases, there are not western alternatives to the services provided by indigenous medicine. The survey obtained clear evidence indicating that black people in Durban make use of both the western and indigenous health care systems.

The survey showed little or no evidence of any positive relationship between low education and income levels and a higher frequency of visits to healers. On the contrary, the healers' customers reported that they would continue to use indigenous medicine even if it became more expensive (see Figure 4.18). In view of the above attitudes, indigenous medicine could be classified as a basic consumer good, such food, clothing, western medicine and housing.

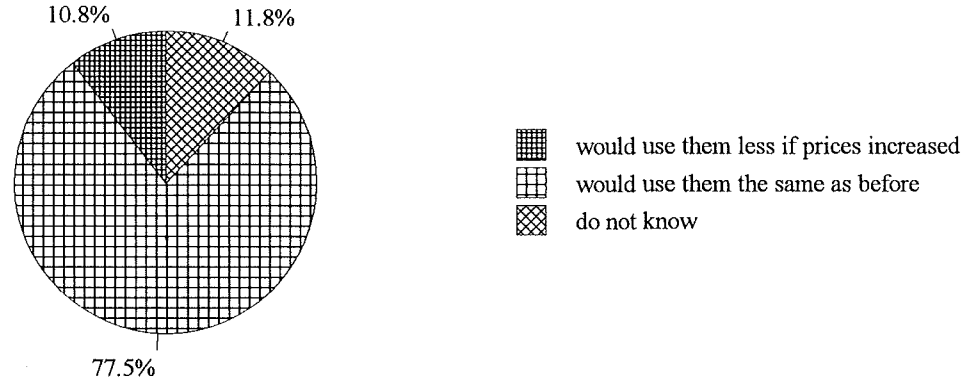
Figure 4.17 : Customers reasons for visiting indigenous healers [n = 99]



In fact, consumers reported that indigenous healers were already more expensive than western medicine (see Figure 4.9, Section 4.1.4).

While the cost of consulting healers may be relatively expensive when compared to clinics, it is important to note that self-medication, using indigenous medicines, was the cheapest form of health care available. This is especially relevant to rural communities. Unlike the cities, where clinics may be relatively easily accessible, rural areas have few clinics and consequently rural communities have little or no choice in the health care systems used. Indigenous health care being the only accessible system for a large proportion of the people given the distances to travel to clinics and the costs of transport.

Figure 4.18 : The response of healers' patients to a potential increase in the price of indigenous medicine



4.2.1.6 The purchasing power of consumers

The purchasing power of consumers can be considered from the perspective of the household or from the individual consumer. Household income is discussed above (Figure 4.15) and shows that there is a wide range in purchasing power, with the majority earning relatively low incomes and therefore individuals having limited purchasing power. However, purchasing power is unlikely to be a significant limitation when buying products for self-medication as this could amount to US$ 1.50 (R 6.70) (the cost of two beers) per year[18] for an individual consumer or US$ 9 (R 40) per household per year[19].

On the other hand, consulting an indigenous healer is likely to represent a significant cost as the average consulting fee (US$ 8.2 or R37) and associated prescribed medicine is some 18 times more expensive than the average cost of medicine bought at the markets for self-medication, and could cost an individual consumer around US$ 28 (R 124) per year. The costs to a household (of six people) could amount to US$ 168 (R 744) per year. The average monthly income earned by households visiting healers is between US$ 178 (R 800) to US$ 333 (R 1 500) per month. Consequently, the average household could spend between one half a month's income (4.2% of annual income) and one month's income (8.3% of annual income) on indigenous medicine per year.

The traders (street, shops and healers) indicated that at least 75% of their customers accepted the price charged, with the remainder bargaining for a lower price. This may indicate that for most consumers, the prices charged are affordable.

While the purchasing power of a large segment of the population is limited due to low income and relatively high costs (in prescribed medicine), it is unlikely to be limited for purchasing products for self-medication. In addition, the consumers indicated that their demand would remain the same irrespective of high prices[20].

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[18] Using an average of 3.34 purchases of indigenous medicine per year.

[19] The average household size for healers' customers is six people.

[20] 'High prices' are probably relative to past experiences of price increases which, if considered by percentage, are considerable (for example, 50% increases in prices are common). However, given the real amount of money involved (US$ 0.11 or R 0.50 increase per product purchased) and the infrequent use of indigenous medicine, it does not constitute a significant cost.

At a community level, the purchasing power of the user group in Durban is significant and amounts to some US$ 1.02 billion (R 4.6 billion) per year[21]. The survey has shown that the demand for indigenous medicine is relatively inelastic, that is, the consumers consider indigenous medicine as a basic consumer good which needs to be purchased to maintain their well-being. Consequently, there is a high degree of certainty that considerable sums of money will be spent on indigenous medicine on an annual basis in Durban. Using the estimated annual expenditure per household on indigenous medicine (between 4.2% and 8.3% of annual household income), then one can estimate that between US$ 42 million (R 190 million) and US$ 84 million (R 380 million) could be spent per annum in Durban.

Using the quantities of plants traded and the average price of raw products bought (R 14/kg), it is possible to estimate the value of expenditure on raw plant products[22].

In Durban some 1 500 tonnes were traded and this would have generated an expenditure of US$ 4.7 million (R 21 million) per annum.

In KwaZulu-Natal, the trade of 4 300 tonnes would have generated an expenditure of some US$ 13.3 million (R 60 million) per annum. This is approximately one-third of the value of the annual maize harvest in KwaZulu-Natal.

At a national level, a trade of 19 500 tonnes would generate an expenditure of US$ 61 million (R 273 million) per annum (assuming the average price of Durban products).

4.2.2 Pharmaceutical companies

4.2.2.1 Who are the buyers

Several pharmaceutical companies are currently developing products for the African market in South Africa. There are reports that some companies are buying raw materials from plant harvesters in rural areas. One pharmaceutical company, which has a major share of the domestic market for western bio-medical products, is currently establishing partnerships to cultivate plants for their production process. Very little information is available regarding the pharmaceutical companies given the high degree of competition and secrecy that exists.

It is known that one of the companies is currently focusing on producing products for the upper-end of the consumer market. The large pharmaceutical company, is also focusing on products which would be registered by the Medicines Control Council, which has high standards matching the conventions in Europe and North America.

4.2.2.2 Quantities demanded

The quantity of plants demanded is unknown at present, and is likely to remain so for the short term until the practices become more established and transparent.

4.2.2.3 The products purchased

A small number of plants are being focused on due to the high costs of pharmacological screening and testing. Some 10 to 20 species are probably the focus of current formal commercial activities[23]. The

[21] This estimate is based on a user population of 2 million, with an average monthly income of R1 150 (US$ 256) and an average household size of six people [Development Bank of Southern Africa, 1994].

[22] These values are the trade in raw products and exclude any value-added through processing or prescription.

[23] Commercial activities undertaken by conventional businesses (in the western sense) rather than informal markets which dominate the current trade in indigenous medicine.

focus is also likely to be on species, which are relatively easily cultivated to ensure that commercial production can be sustained.

4.2.2.4 The timing of purchases

Whilst the products are still being developed and consumer preferences have not been tested in the market place, the timing of purchases is likely to be unknown.

4.2.2.5 The reasons for purchases

Pharmaceutical companies purchase material to process and trade to consumer outlets. The business opportunities associated with the large numbers of indigenous medicine consumers have, until recently, been largely ignored by the pharmaceutical industry. Recent research into the size of the indigenous medicine market has fuelled considerable interest by local companies.

4.2.2.6 The purchasing power

The purchasing power of large pharmaceutical industries is considerable relative to other market players in the trade. The access of large corporations to finance is far greater than the monies available to the operators in the current indigenous medicine trade. However, despite the greater purchasing power, established pharmaceutical companies are unlikely to purchase large volumes of material from existing traders, due to the unreliability of supply and current legislation.

5. THE SUPPLY OF MEDICINAL PLANTS IN KWAZULU-NATAL

This study has established that the large volume of indigenous medicinal plants, which is traded in the southern African markets, is harvested from wild populations, with insignificant cultivation taking place. These plants are harvested from within South Africa and from neighbouring countries such as Swaziland, Lesotho, Mozambique and Namibia. The supply of high value plants has declined leading to concerns within the industry and conservation agencies.

5.1 Sources of supply

Medicinal plants supplied to the markets in KwaZulu-Natal are harvested from a wide range of habitats in the region, including coastal forests, coastal grasslands, mangroves, swamp forests, grasslands, woodlands, riverine forest, montane forest, wetlands, and sub-alpine grasslands. These habitats are located on communal lands, commercial farms, forestry estates, protected areas, and in neighbouring countries.

5.1.1 Domestic sources

The majority of the plants are harvested from wild populations on communal lands. Popular species, which are no longer available in these communal areas, may be harvested on forestry estates (exotic plantations with natural areas), commercial farms, and protected areas. Harvesting takes place with or without the consent of the landowners or local authority. There is limited commercial cultivation of medicinal species for local markets, although several organizations, such as Silverglen Medicinal Nursery, Institute of Natural Resources, Mondi Forests (a timber company) and several conservation agencies are promoting the cultivation of medicinal plants by farmers and other commercial enterprises.

5.1.1.1 Supply from wild populations in communal areas

The main source of plants for markets in KwaZulu-Natal is from communal or tribal lands where there is generally easy access to forest and grassland resources. In South Africa, there has been an erosion of tribal authority, and little or no state support for developing management systems for communal

natural resources. Consequently, there are limited skills and motivation to promote natural resource management in these areas. This has led to a situation where rural communities take little or no responsibility for the state of their natural resources, allowing individuals in the community or outsiders to exploit medicinal plant populations with little or no control [Mander 1997a].

The communal areas closest to the urban and rural markets have been the primary focus of harvesting activities. However, as high value or popular plants have been depleted in these areas, harvesting of popular and scarce species takes place in more and more distant areas. A comparison between key harvesting locations identified by Cunningham [1988] and locations identified in the course of this study show the extent to which harvesting locations have shifted for nine popular species in the last 8 years (1988 to 1996) (see Table 5.1).

The location of the main harvesting areas has increased in distance from Durban, with an average increase in travel time[6] of 45% (or 2 hours) over 8 years, between the source and market. The change in travel time ranges between an increase of 1 hour to 4 hours. For example, *Eucomis autumnalis*, a formerly common grassland bulb which was harvested largely within two hours travel, is now being extensively harvested in areas of 4 to 5 hours away. Furthermore, other barriers to trade, such as international borders and the associated trade controls, are increasingly being encountered and overcome in order to meet the demand for plants. Six out of the nine most popular medicinal species being studied (66%) are now being harvested in either Swaziland and/or Mozambique, and transported to the Durban markets for sale (see Figure 5.1).

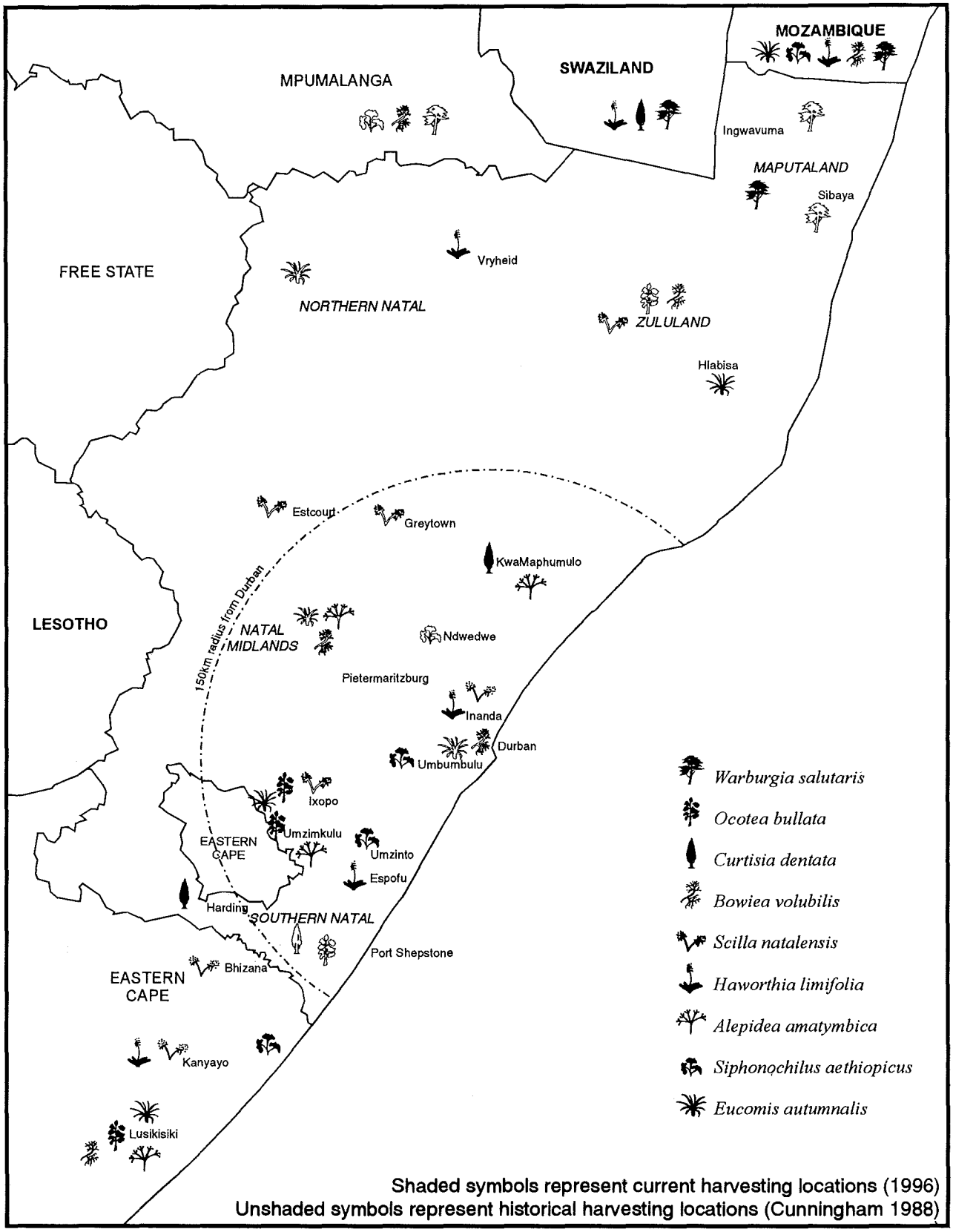
Photo 6: Ornithogalum bulbs being harvested for the market.

[6] Travel time has been used to give an indication of changes in the distance between the markets and the source as it represents a more realistic barrier in the market than distance.

Table 5.1: Changes in the location of key supply areas for nine popular plants

Plant name	Major locations of current harvesting	Distance to market in time by taxi travel	Past areas of harvesting Cunningham (1988)	Distance to market in time by taxi travel	Difference in time taken to travel to the market	Differences between past and current harvesting locations
Warburgia salutaris	Swaziland, Mozambique, Maputaland	5 to 8 hours	Transvaal, Sibaya Ingwavuma	5 to 6 hours	+2 hours 33% increase	Shift to harvesting in remote locations in two foreign countries, and with greater distances to transport material
Siphonochilus aethiopicus	Mozambique, Umzinto and Umbumbulu and Transkei	2 to 8 hours	Transvaal, Ndwedwe	3 to 7 hours	+1 hour 13% increase	Shift to harvesting in remote locations in one foreign country
Boweia volubilis	Mozambique, Lusikisiki, Zululand	4 to 8 hours	Natal Midlands, Transvaal, Local	2 to 6 hours	+2 hours 33% increase	Shift to resources in remote locations in one foreign country, and with greater distances to transport material
Eucomis autumnalis	Lusikisiki, Ixopo, Hlabisa and Mozambique	3 to 8 hours	Natal Midlands, Local, Northern Natal	1 to 4 hours	+4 hours 100% increase	Greater distances being travelled to more remote locations, and the harvesting of resources in a foreign country
Ocotea bullata	Ixopo, Mzimkhulu, Lusikisiki	3 to 5 hours	Southern Natal, Zululand	3 to 4 hours	+1 hour 25% increase	A relatively small increase in more remote locations
Alepidea amatymbica	Kwamaphumulo, Lusikisiki, Ixopo	2 to 5 hours	Natal Midlands	2 to 3 hours	+2 hours 33% increase	A relatively large increase in more remote locations
Curtisia dentata	Kwamaphumulo, Swaziland, Harding	2 to 6 hours	Southern Natal	3 hours	+3 hours 100% increase	An increase in more remote locations, including harvesting in a foreign country
Scilla natalensis	Inanda, Kanyayo, Bhizana	1 to 5 hours	Zululand, Ixopo, Greytown and Estcourt	2 to 4 hours	+1 hour 25% increase	A relatively large increase in more remote locations
Haworthia limifolia	Kanyayo, Inanda, Espofu, Vryheid, Mozambique, Swaziland	2 to 8 hours	Not recorded			Harvesting in remote locations including in two foreign countries.

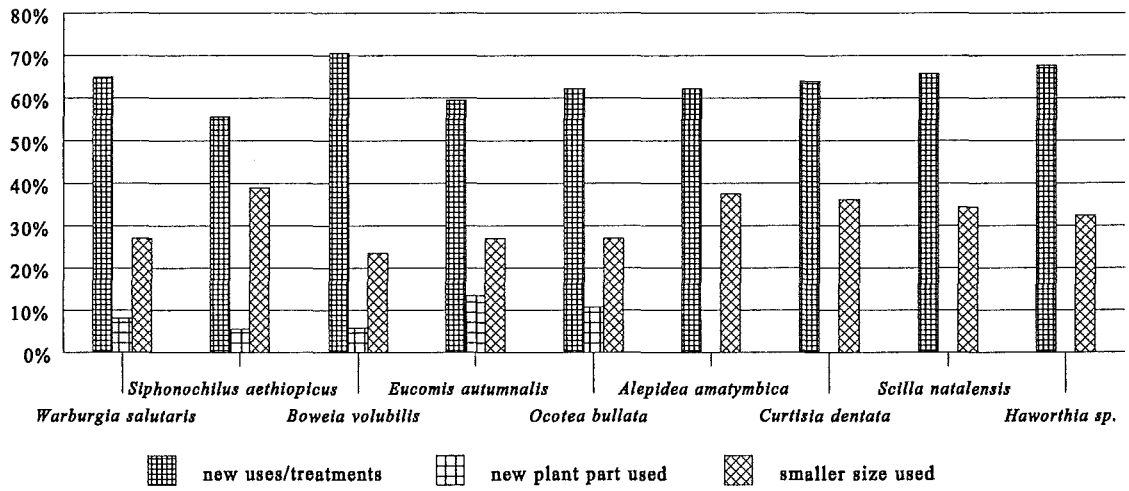
Figure 5.1: The changes in location of key harvesting areas for nine popular species (1988 to 1996)



The declining size of bulbs and thickness of bark also illustrate the scarcity of plants. Indigenous healers have reported that they are increasingly using smaller sizes of plants, indicating that popular plants are getting less and less opportunity to grow and to reproduce. Between 25% and 39% of the healers indicated that, for the nine popular plants, they were now using smaller sizes than before. Between 8% and 15% of the healers indicated that they were now using different plant parts (see Figure 5.2).

The general lack of willingness and/or ability to enforce property rights associated with plants in the region, combined with the high levels of poverty in rural areas, exacerbates the destructive methods of harvesting. Rural women are desperate to generate a cash income, and will therefore harvest large numbers of plants for sale to the markets. Sustainable harvesting is not practised, as harvesters have no guarantees that they will benefit from any wise harvesting of species. The above factors result in a highly destructive approach to harvesting with each high value plant population becoming depleted, leading to a new focus on either a different species or on a further area which may still have high value plants.

Figure 5.2 : Percentage of healers reporting changes in the use of plants over time [n = 37]



A further destructive condition, which impacts on plant populations, is the fact that most women harvesters concentrate their activities in one area. They are unlikely to shift to new areas to look for a particular species due to travel costs, and will focus on different species to harvest. This means that a population of popular species will not be given a chance to regenerate as any individual popular plant seen while in the course of gathering other plants, will be collected. Consequently, popular species face localized extinctions in areas where harvesters regularly gather medicinal plants for the market.

As consequence of the above approaches to harvesting, the supply of indigenous plants from communal areas is declining, leading to a shortage of popular plants in the market. The local extinctions and concomitant increasing distance to harvesting locations, and the declining size of the plants utilized by healers, are clear indicators that the current supply of plants from communal areas is not sustainable. This has resulted in an increase in imports and an increasing interest in cultivation.

5.1.1.2 Supply from commercial farms

There are several commercial operations initiating the cultivation of indigenous plants to supply markets. Production is focused on supplying high value plants to pharmaceutical companies either within South Africa or in European markets. Production for the South African market is believed to be

be limited to a few species that can be registered with the Medicines Control Council[7]. In KwaZulu-Natal there are low supplies of plants from commercial farms.

The level of harvesting from undeveloped areas on commercial farms is unknown. The localities identified by the plant gatherers indicate that there is limited harvesting on commercial land. There is however, some illegal harvesting from commercial farms or estates. There has been an increasing awareness amongst landowners regarding the value of medicinal plants, and it is unlikely that any large-scale harvesting takes place on commercial farms. Harvesting plants for home consumption by farm labourers is likely to be the largest form of use on these properties.

5.1.2 Imports

A number of plant species are imported into South Africa (including KwaZulu-Natal) for the medicinal plant trade. The imports take place on an informal basis with no documentation or customs authorization. There is considerable labour migration between Lesotho, Swaziland, Mozambique and South Africa, and this promotes a large informal movement of plant material. Rural families from neighbouring countries frequently have members of their households or community working within South Africa, particularly in large cities, thereby providing remote locations with market information and transport mechanisms. The material is usually traded in its raw form and can be either sold on street markets, in shops, by healers or by wholesalers.

Popular species, now becoming increasingly difficult to obtain in South Africa, are the main focus of trade. Discussions in the Durban market have indicated that *Haworthia limifolia*, *Boweia volubilis* and *Warburgia salutaris* are imported in large quantities from Swaziland and Mozambique. These two countries are now recognized as the main sources of supply for these species. Two other species in great demand, *Alepidea amatymbica* and *Eucomis autumnalis*, are imported from Lesotho but in small quantities. (Figure 5.1 indicates some of the other important species that are imported from neighbouring countries.)

The different sources of imports can be ascribed to the distribution of species. All of these species are still found in South Africa but the declining local supply and increasing in-accessibility has led to the importation of these species from countries where they are still common and/or easily accessible.

The quantities of plants imported into South Africa are unknown. The informal nature of the plant trade and the illegal nature of imports make it difficult to make any quantitative estimates of the quantities imported into South Africa. For one species, *Warburgia salutaris*, it may be possible to provide some idea of what is being imported due to the localized extinction that has occurred in parts of South Africa. The market survey estimated that some 17 tonnes of *Warburgia salutaris* were traded in Durban in 1996 and Williams *pers. comm.* 1997 suggests that between 10 and 20 tonnes were traded in Gauteng (formerly the Johannesberg area) in 1995. As the Durban and Gauteng markets are the major trading conduits, it is likely that between 30 to 40 tonnes of *Warburgia salutaris* are imported annually from Mozambique and Swaziland. Some of the other species, such as *Boweia volubilis*, *Siphonochilus aethiopicus*, *Curtisia dentata*, *Eucomis autumnalis*, and *Haworthia limifolia* are also imported to some degree but the quantities are unknown. For example, 33% of the traders selling *Boweia volubilis* (or nine traders), indicated that they obtained their plants in Mozambique.

[7] Due to the infancy of large-scale commercial ventures in the indigenous medicine markets and the lack products on the market, there is considerable secrecy in the industry. Little information will be available until products are openly traded.

5.2 Current and potential production

Current production of market materials

The current production of plant material for the market is unknown but can be based on the estimates made in Section 4.1.1 and 4.1.3 regarding consumer demand. The total quantity of plant material supplied to the markets in Durban is 1 500 tonnes a year, and for KwaZulu (including Durban) it is estimated to be some 4 300 tonnes a year. At national level it is suggested that some 19 500 tonnes may be traded[8]. However, these quantities should not be considered as production but rather as harvesting since little or no cultivation or processing takes place.

The above quantities are harvested from wild populations and consequently the stock of plants is not known. It is thus not possible with our present level of knowledge to predict the potential production of these wild stocks. However, what is known, is that for many species the current levels of harvesting are not sustainable. Observations of the market indicate that a number of species are becoming scarce, with concomitant price increases, increasing imports, irregular supply, reductions in the size and/or thickness of plant products, and increasing use of substitute plants. For example :

- *Siphonochilus aethiopicus* - sells for between 10 and 30 times the average price[9] of other popular plants in the market.
- *Ocotea bullata* - alternative tree species (*Cryptocarya* spp.) in the Laurel family is increasingly being used as a substitute.
- *Warburgia salutaris* - sells for double the average price of other bark products and is mostly imported from Mozambique.
- *Eucomis autumnalis* - the average size of bulbs is getting smaller and they are frequently unobtainable in the markets (see Figure 5.2).
- *Alepidea amatymbica* - previously a common species in the province is now being imported from the Eastern Cape and Lesotho, or being collected in more distant localities. Its price is increasing and market players are finding it increasingly difficult to maintain their preferred stock levels.
- *Boweia volubilis* - large bulbs are scarce and sell for more than three times the price (per unit weight) of small bulbs.

The above examples describe the market conditions for some of the most popular medicinal plants traded, showing the effects of trade on species. This evidence is supported by the observations of market players (see Figure 5.3). For the nine popular species, between 45% and 55% of the healers reported that the sale of plants had increased (largely due to increasing demand). However, for these same species, between 19% and 30% of the healers indicated that sales had declined due to scarcity. Healers who are less well connected or who have fewer financial/transport resources are likely to have less access to any species that may become scarce.

Sixty percent of the healers interviewed indicated that they used substitute plants, showing the degree to which shortages may occur in the market.

The harvesting technique used in gathering plant material is highly destructive contributing to the decline in supply to markets (Figure 5.4). Of the most important plants traded in the markets, approximately 28% of the plants have the whole plant or bulb harvested. A further 63% of the plants have either their roots or bark harvested, which for small plants would imply that the whole plant would be extracted from the ground, and for large plants it would imply a high risk of death due to

[8] The KwaZulu and South African estimates are based on the assumption that the Durban population is a proxy for the entire provincial and national population.

[9] Prices refer to price per kilogram and not to price per unit.

damage to the plant. For scarce species, ring-barking is frequently practised to maximize the harvest of bark, usually causing the death of the tree.

The scale of harvesting, the destructive methods used, and the lack of cultivation have contributed to a widespread decline in plant populations throughout the province and surrounding areas. This has led to considerable concern regarding the sustainability of supply. For example, studies by Cunningham [1988] indicate that harvesting levels, at the time of his work, were not sustainable. In southern Natal forests, some 51% of *Ocotea bullata* trees and 57% of *Curtisia dentata* trees were estimated to have more than 50% of their bark removed. In Maputaland, all *Warburgia salutaris* trees greater than 5 cm in diameter (at breast height), located in the study (excluding protected areas), had been debarked. Similarly, for an area closer to Durban, Oatley [1979] estimated that 99% of some 450 *Ocotea bullata* located, had their bark damaged and Cooper [1979] estimated that for six areas where he had been working, some 95% of the *Ocotea bullata* had been damaged, with 45% of the trees ring-barked and dying.

Figure 5.3 : Percentage of healers reporting changes in the sales of medicinal plants [n = 39]

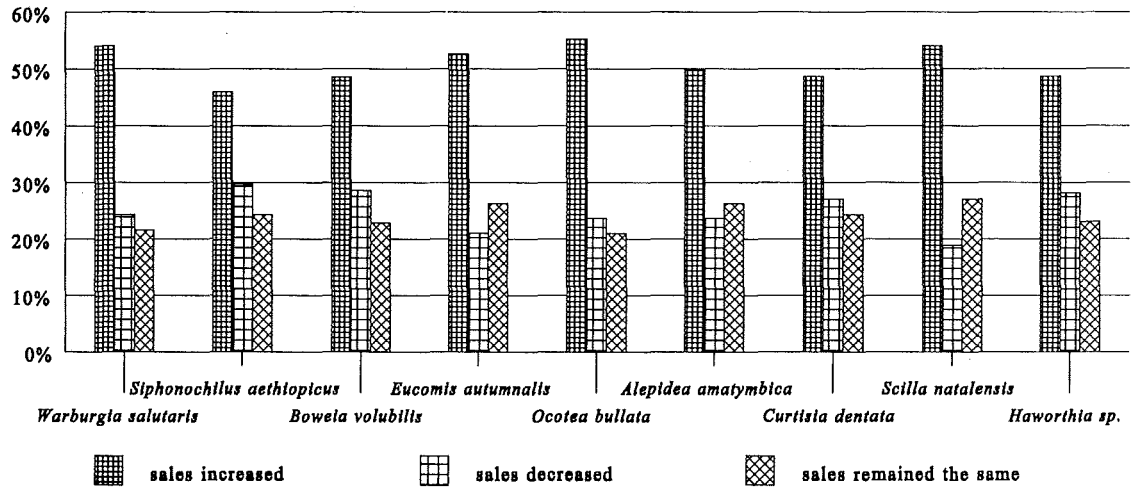
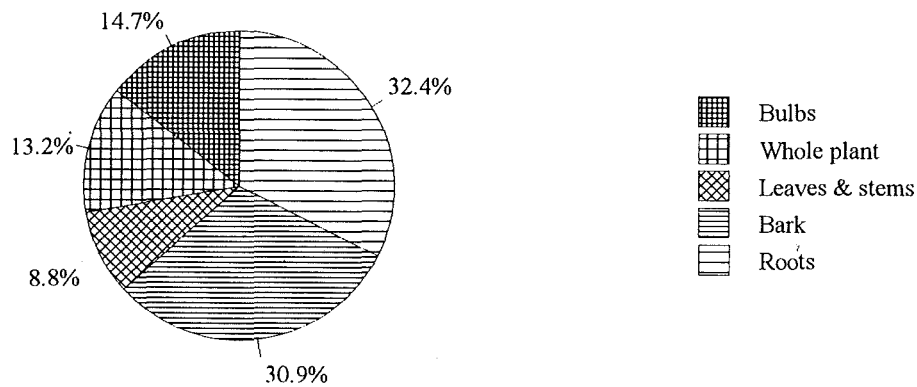


Figure 5.4 : Plant part used for important market species



There has been some cultivation of popular medicinal species by Silverglen Medicinal Nursery, Natal Parks Board, the Institute of Natural Resources, and Mondi Forests. This production is however not intended for markets but rather for research, education, and to provide foundation stocks for further propagation. These activities therefore do not provide a significant source of supply. There is also a

growing number of healers beginning to cultivate plants for their own practices but these are as yet insignificant in terms of the volumes produced. There is one farmer in KwaZulu-Natal currently cultivating *Siphonochilus aethiopicus* for the indigenous medicinal trade within KwaZulu-Natal.

Potential production of market materials

The decline in access to plant species indicates that current harvesting levels are not sustainable, and it can be anticipated that unless management and/or propagation is undertaken greater shortages of plant material are likely to occur in the future. The supply of other popular species can also be expected to decline in the future. It is possible that currently popular species may face local extinctions, as has already happened for *Warburgia salutaris* and *Siphonochilus aethiopicus*.

Current market trends have indicated that plant populations will continue to decline in the future while harvesting is not managed and demand is sustained. The areas for potential harvesting have been reduced significantly, with the area of grasslands, savannah and thicket being reduced from 72 000 km^2 to 29 000 km^2 (see Table 5.2). A 60% reduction in harvestable[10] grasslands and savannah area has taken place due to land use changes and past harvesting pressure.

The potential area of forests which are available for harvesting have been reduced from 889 km^2 to 260 km^2 (see Table 5.3). A 70% reduction in harvestable area has occurred through the intensive use of forests not protected by either conservation agencies or private land owners.

Table 5.2: Grassland, savannah and thicket biomes - the area available for plant harvesting

Grassland, savannah and thicket biome	Area
Total area in KwaZulu-Natal[1]	85 415 km^2
Total area protected[1]	7 687 km^2 (9%)
Area not protected and undeveloped[2]	72 000 km^2
Land area already developed (timber and crops)[2]	17 000 km^2
Potential area available for harvesting	55 000 km^2
Available area (communal lands) already intensively harvested[2]	26 000 km^2
Area available for future harvesting with limited past commercial harvesting (commercial farm)	29 000 km^2

1 Low and Robelo 1996
2 Department of Agriculture 1997

Table 5.3: Forest biomes - the area available for plant harvesting

Forest biome (sand, coastal and Afro-montane)	Areas
Total area in KwaZulu-Natal [1]	1 185 km^2
Total area protected [1]	298 km^2 (25%)
Potential area available for harvesting	889 km^2
Forest area on commercial farms with limited past commercial harvesting[2]	260 km^2
Area (generally communal lands) already intensively harvested	629 km^2

1 Low and Robelo 1996
2 Cooper 1985

10 The reduction in area does not imply that all medicinal species have been removed from the area, but rather that the popular and high value species are present in minimal quantities.

For both groups of biomes, the protected areas, plantations, crop-lands, and developed land have been excluded. These areas could not be utilized due to either the absence of indigenous plants or the protective legislation governing the use of indigenous plants.

The previous discussions on supply (see Section 5.1.1 and Figure 5.1) indicate that common property areas in KwaZulu-Natal have largely been exhausted of the high value and popular species, with the only areas of high potential remaining on private property or in more distant locations out of the province. There has however been selected exploitation of scarce forest species (*Ocotea bullata*) on private properties in KwaZulu-Natal [Cooper 1985], indicating that the estimates made for available forest resources may be too high.

The greater reduction in forest area compared to grasslands/savannah, can be ascribed to equal popularity of grassland/savannah and forest species. Of the 68 species identified by street traders and plant gatherers as being important trade items, 49% were forest species and 51% were grassland and savannah species (see Table 7.1). The intensity of harvesting in forests has therefore been considerably higher than harvesting in grasslands and savannah, with the area of forests being some 61 times smaller than the available area of grasslands/savannah. The grassland and savannah species used tend to be dominated by plant forms with short life cycles such as bulbs and rhizomes, while forest species used are dominated by bark producing trees, which take many years to mature.

Assuming that the proportions of plant species used from the respective vegetation biomes was matched by the mass of plants used (that is, 51% of the species represented 51% of the mass traded), then the forests would need to produce some 8.1 tonnes per km^2 per annum, while the grasslands would need to produce some 78 kg per km^2 per annum [11]. These are not accurate estimates, but are rather an illustration of the orders of magnitude of supply constraints and opportunities within the different biomes.

The above discussion regarding potential areas for harvesting indicates that grasslands and savannahs on commercial farms could be managed on a sustainable basis to supply material for the plant markets. A large grassland and savannah area remains relatively underutilized in terms of medicinal plant harvesting. However, forests on commercial farms would be unlikely to be able to supply sufficiently large quantities of medicinal plants for the market in KwaZulu-Natal. The sustained harvesting of 78 kg a km^2 per annum may be feasible in grasslands and savannah, while the harvesting of 8.1 tonnes per km^2 per annum of material from existing forests would not be sustainable. The implications of the above are that grassland species could be managed to supply plants for the market in the short term, while forests could only produce the required volumes in the long term provided extensive enrichment planting and management takes place.

Another option to sustain and possibly increase supply is cultivation. Experience in South Africa has indicated that it is possible to cultivate medicinal species in farming systems. The economic feasibility is however unknown. Experiences in India, China and USA have shown that it is possible to produce large volumes of medicinal plants for the market [Lambert *et al.* 1996]. This implies that it would be possible to produce sufficient plant volumes to meet the demand for indigenous medicinal plants in South Africa should the necessary levels of farm investment take place. However, while it may be possible to supply large quantities of bulbs, tubers, and herbs in the short term, it would take considerably longer to produce sufficient bark products to meet market demand. The slow growing nature of several popular tree species implies that should large-scale production take place, it is unlikely that an increase in the production of bark products would be feasible in the short to medium term.

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[11] Method used to estimate production required from remaining underutilised vegetation biomes :
Grassland and savanna biome : (51% × 4 300 tonnes of marketed materials in KwaZulu-Natal) = (2 193 tonnes)/28 000 km^2 of available grasslands and savanna = 78 kg per km^2
Forest biome : (49% × 4 300 tonnes of marketed materials in KwaZulu-Natal) = (2 107 tonnes)/260 km^2 = 8 100 kg per km^2

There is one option that could be used as an interim measure to enhance the supply of several popular tree species in the short term. Medicinal tree species, such as *Ocotea bullata* and *Curtisia dentata,* are harvested as high value timber from southern Cape indigenous forests. This harvesting provides a potential bi-product in the form of bark for the medicinal plant trade. The quantities produced in the southern Cape would need to be investigated.

5.3 Quantities by products

The market survey focused on the market as a whole as well as on nine popular species. The mass traded within the market is illustrated in Table 5.4 and is based on the estimates of consumer demand (see Section 4.1).

Table 5.4: Mass traded within the market

Trading area	Quantities traded per annum
Durban City (including surrounding areas)	1 519 tonnes
KwaZulu-Natal (province)	4 339 tonnes
South Africa	19 500 tonnes

The total tonnage traded in Durban has been estimated to be some 1 500 tonnes per year. The products included would consist of bulbs (making up a large proportion of the mass), bark, tubers and herbs. The Durban estimates can be used to provide an indication of regional and national quantities assuming the similarities in the population (see Section 4.1.3).

The survey also collected detailed information on nine popular species in Durban and the annual mass of these plants traded are illustrated in Table 5.5 in descending order.

Table 5.5: Quantities of nine popular species sold in the Durban Medicinal Trade

Botanical Name	Zulu name	Tonnes traded per year
Scilla natalensis	Inguduza	95.5
Eucomis autumnalis[1]	Umathunga	73.2
Boweia volubilis	Igibisila	43
Alepidea amatymbica	Ikhathazo	31.2
Ocotea bullata	Unukani	25.3
Curtisia dentata	Umlahleni	23.9
Haworthia limifolia[1]	Umathithibala	22.5
Warburgia salutaris	Isibhaha	17.2
Siphonochilus aethiopicus[1]	Indungulo	1.9

[1] These estimates may include other species within the same genus which are not always distinguished as separate species by the traders and healers.

Scilla natalensis is a popular bulb with little supply constraints yet and with large populations still extant within the province. This serves to provide a context for understanding the levels of trade in other popular species. Bulbous species can be expected to contribute to greater proportions of the trade (on a weight basis) given the high moisture content within bulbs, hence the top three masses are all bulb species. However, what is useful to note is that the volume of *Boweia* traded is approximately half that of *Scilla natalensis*, probably a result of both greater scarcity and less demand. In terms of the bark traded, it can be seen that 30% less *Warburgia salutaris* is traded relative to the two other popular barks, even though it is considered to be one of the most popular medicines. This can be ascribed to the scarcity of the plant within South Africa. *Siphonochilus aethiopicus* is traded in low volumes due to the scarcity of the plants and the relatively small mass of the products sold. The total

mass of the nine popular species (2% of species traded) amounts to approximately 22% of the total tonnage traded in Durban every year.

The numbers of plants/units traded for the nine most popular species have been estimated and are listed in Table 5.6.

While there were considerable differences between species in the overall mass sold, it is interesting to note that in terms of the bulbs and succulents, the range in numbers sold was similar, that is, between 310 000 and 480 000 plants were used per year. For the trees, the range is between 1 400 and 2 100 trees used per year. *Alepidea amatymbica* rates as the highest number sold as, on average, four plants are sold in every transaction.

In terms of mass, the greatest quantity traded (*Scilla natalensis*) is some 51 times greater than the lowest quantity traded (*Siphonochilus aethiopicus*), while in terms of numbers, the greatest number sold (*Alepidea amatymbica*) is some 35 times more that the least numbers sold (again *Siphonochilus aethiopicus*).

Table 5.6: Number of plants and the units traded for the nine most popular species

Botanical name	Number of purchases made per year [1]	Equivalent plants used per year [2]	Plant material used
Curtisia dentata	548 000	1 494	Tree bark
Ocotea bullata	529 000	1 581	Tree bark
Warburgia salutaris	514 000	1 075	Tree bark
Haworthia limifolia	479 000	479 000	Whole plant
Alepidea amatymbica	455 000	1 820 000	Herb root
Scilla natalensis	432 000	432 000	Bulb
Eucomis autumnalis	428 000	428 000	Bulb
Boweia volubilis	386 000	386 000	Bulb
Siphonochilus aethiopicus[3]	67 142	52 800	Rhizome

1 The number of purchases is based on the mean mass of plant material purchased per sale (either a part of a plant, a whole plant or many plants) at the time of the survey.

2 The equivalent plant numbers are based on the total annual market mass traded divided by; in the case of a bulb, root, rhizome or whole plant, the mean market mass per entire plant, and in the case of trees, by an assumed mass of 16 kg (dry weight) of harvested bark per tree. This assumption is based on average mass derived from bark harvested from three of the most popular bark species traded.

3 *Siphonochilus aethiopicus* is frequently sold in shops and healers' practices in pieces (at a mean mass of 6 g) due to high prices, while in the street markets it is usually sold whole (at a mean mass of 35.6 g). An average sale mass of 21 g is used to estimate the number of sales, while the average mass of whole plants is used to estimate the numbers of plants sold.

5.4 Description of producers

The current producers of material for the Durban markets are rural women, who harvest a wide range of plant material from mainly communal lands. There are no costs incurred in the cultivation of plants as only wild populations are harvested, although there are harvesting and transport costs. Women gathering plants for trade to the market came from a wide range of geographical locations. Of the 55 different areas identified as home locations, 24% lived within 100 km from Durban; 33% lived between 100 km to 200 km away from Durban; and 45% lived between 200 km to 500+ km away from Durban. The largest number of gatherers originated from distant localities in communal areas.

The general harvesting approach used is for individuals or groups of women to scout around in the various vegetation associations within their immediate vicinity. Gatherers interviewed indicated that

they may be assisted by, on average, one (Ezimbuzini market) and 1.6 (Russel Street market) other people in harvesting activities. Any plants considered marketable, based on observations of the markets and/or from reports from associates, are collected. Marketability depends on both the species, the size of the plant and the time of month/year. Gatherers tend to concentrate their harvesting during the month and then market their products towards the end of the month. This harvesting approach results in a peak in marketing around the end of the month. The end of the year also produces a peak in trade, especially for live plants.

A range of basic implements is used to harvest material. Bark is harvested by using an axe or cane knife (machete). Bulbs and roots are dug up using a hoe, metal rod or similar metal instrument. During the winter months there are relatively fewer bulbs harvested due to the aerial plant parts dying back and the plants becoming less visible. The advent of summer and the development of leaves and flower heads, results in a reversal of this trend.

The plants are placed in woven plastic sacks and generally carried on their heads back to the homestead. Harvests are accumulated until quantities are large enough to warrant a journey to the market. Bark products are usually dried before being transported to the market. Little other processing takes place.

Many of the gatherers in KwaZulu-Natal travel to the Durban markets themselves, and there they can undertake some processing, depending on the species traded and the experience of the gatherers. The unprocessed products consisted of whole live plants such as *Haworthia*, *Clivia*, *Gasteria*, and numerous bulb species. Partially processed products consisted of sections or chunks of plant parts such as roots, tubers, branches, bark, and bulbs. Products with greater levels of processing consisted of unmixed chopped and ground bark. The most sophisticated processed products were special mixtures, such as 'ntelezi' and 'ubulawu', consisting of mixtures of chopped bark and bulbs and other plant parts.

In Durban it is estimated that there are approximately 7 500 gatherers selling material directly to healers. Healers reported that they have on average five gatherers collecting for their practices. In addition, some 670 gatherers traded their produce in the street markets. In total, over 8 000 gatherers harvest materials for the Durban market. Similarly, using Durban as a proxy for KwaZulu-Natal, it is estimated that there would be at least another 8 000 gatherers given that approximately half the population of KwaZulu-Natal resides in and around Durban [Development Bank of Southern Africa 1994].

The incomes earned by the rural gatherers are a very important household resource. In the Russel Street and Ezimbizini Street markets, the gatherers earned an average of US$ 98 (*R* 440) and US$ 67 (*R* 300) per month, respectively. While these amounts are only 56% and 38% of the minimum wage in South Africa (Wage Act, Act 5 of 1957), it nevertheless represents a significant income, as in most cases there are few alternative income sources in underdeveloped rural areas. The cash incomes are important, providing rural women with monies for consumer goods.

While individual gatherers are the major producers for the market there are two other groups which also harvest products for the market. There are entrepreneurs, which may hire casual labour to harvest bulk quantities of plants. Their general *modus operandi* is to transport gatherers into localities, which are known to have abundant supplies of valuable plants. Harvesting takes place, and the products are then transported back to the entrepreneurs' shop or practice. The other group of producers are the indigenous healers themselves. Many Durban healers reported that they would on occasion collect plant material themselves. This takes place in special cases when specific rituals have to be performed in the harvesting of the plants. However, the Durban healers reported that they would only do this once or twice a year. In rural areas, the healers are more active in collecting plants.

As mentioned in Section 5.2, there is a movement amongst healers to start growing medicinal plants for their own practices. While this activity is limited at present, the demand for assistance and plant resources is growing in both rural and urban areas. The information and learning opportunities

provided by various organizations regarding the propagation potential of medicinal plants is leading to increasing numbers of healers starting to produce plants at their homesteads. The numbers involved are however unknown at present but appear relatively insignificant given the total quantity of plants used in the industry.

The present focus of production (or more aptly termed harvesting) are the communal areas. There is however active but illegal harvesting within protected areas, private commercial farms and forestry estates. During the course of research, several gatherers have indicated that they have intimate knowledge of selected plant populations within protected or private areas. These areas are likely to play an increasingly important role in production as the population of high value species declines in more accessible areas.

5.5 Competition between the suppliers

There is competition between the various plant collectors at both the source of plants and at the market. As there is little or no cultivation taking place, plant harvesters compete for available plant resources. This competition is exacerbated due to the most accessible plant resources being located in communal areas where property rights are not well defined. This situation leads to competition both within and between different groups, including resident gatherers, contracted gatherers (associated with outside entrepreneurs), and indigenous healers.

There is particular competition in the harvesting of high value species, such as those that are the focus of this survey. As these species are in greatest demand and fetch the highest prices, they are the most sought after trade items. Furthermore, the increasing shortage of high value species results in gatherers, healers and entrepreneurs travelling to more distant locations in order to obtain trade goods. For example, rural women in northern KwaZulu-Natal now travel into Mozambique to buy *Warburgia salutaris* bark as local stocks are depleted, creating competition between the Mozambican gatherers, who may be selling to South African or Mozambican buyers.

Apart from competing for plant resources to trade, there is also competition in the sale of plant material to buyers. This competition is associated with trading sites and with customer allegiance. Competition takes place within the street or open markets in Durban and rural markets where products are sold. The gatherers who sell on the streets are generally more mobile and therefore tend to trade more on the periphery of the market, while the more permanent traders have established and maintained their rights to a particular stall site. In order to compete with the more permanent traders, the gatherers may form a group which rotate their visits to the city thereby ensuring that one of the group is always at their market site, maintaining their preferred market position.

There is also competition between street traders and shop traders. Past legislation in South Africa severely limited informal street trading, resulting in the shop traders having a retail monopoly in the medicinal plant industry within urban areas. In the 1980s the shop traders were the main suppliers [Cunningham 1988]. However, this has now changed with the street traders becoming the dominant urban suppliers. The democratization of South Africa and the relaxation of laws limiting informal street trade has resulted in the shop traders losing an estimated 50% to 60% of the medicinal plant market to the street traders.

In order to avoid competition on the streets, some gatherers sell plants directly to shop traders and healers developing consumer allegiance for their products. For example, the Durban healers indicated that apart from buying on the street markets, they also had on average five gatherers collecting plants for them.

6. DEMAND AND SUPPLY POTENTIAL

The demand and supply potential of the medicinal plant trade in South Africa has in the past been largely unknown and consequently poorly developed. The past racially-based policies of the South

African Government created a narrow perspective of agriculture, nature conservation and health care. The plant trade and utilization has consequently been ignored by formal health and agricultural services, while conservation agencies have focused on trying to limit the impact of the medicinal trade on biodiversity.

Furthermore, the users and traders themselves have done little to develop the potential of the medicinal plant trade, probably a result of underdevelopment of the associated population, aggressive competition between various market players, and an abundant supply of wild plants. These factors have prevented any unified approach to the development of the industry.

As a consequence of the various perspectives of the indigenous medicinal plant industry and especially the lack of any organized marketing, few of the potential opportunities have been developed. The opportunities, constraints and potential of the medicinal plant market are therefore critical issues to consider in developing the industry.

6.1 Opportunities

6.1.1 Demand opportunities

As shown in Section 4.1, the demand for indigenous medicine in KwaZulu-Natal is considerable, with an estimated 84% of the black population, or 70% of the total population making use of traditional medicine. There are over 6 million indigenous medicine consumers in KwaZulu-Natal.

Indigenous medicine is a basic consumer good for which there are limited alternatives. This statement is supported by the frequency of visits to healers, the relatively high costs of a consultation and their use by people in a broad range of economic strata. Black clinic patients indicated that 40% of the health care services they used per annum were from indigenous practitioners and cost on average US$ 8.22 (R 37) a consultation, seven times greater than the cost of a clinic visit. Given the willingness to pay relatively high fees for indigenous medicine, the current level of demand (for example, 1 500 tonnes per annum in Durban or 4 300 tonnes for KwaZulu-Natal) is unlikely to decline.

In addition to the limited variability in overall volumes demanded, there is also likely to be limited variability in the demand for specific species. Interviews with healers indicated that the use of alternative species was largely unacceptable (see Figure 6.1). Producers are therefore assured that consumption of selected species is unlikely to change through the use of alternatives. These guaranteed consumption patterns serve to lower the risks for cultivation initiatives, especially for longer term crops such as *Warburgia salutaris*.

In addition, the demand for medicines is relatively price inelastic. Some 78% of the healers indicated that their customers generally accepted the prices charged for medicine and 78% of the healers' patients indicated that they would continue to use indigenous medicines in a similar way even if the price was to increase (see Figure 4.18). The price inelasticity provides an indicator to producers that there is flexibility in the prices that can be charged for medicinal plants or associated products.

There are considerable differences in prices for various popular plants, further evidence of a willingness to pay for more expensive products in the market. The higher prices also provide an opportunity for cultivation and processing to develop within the medicinal plant market.

The demand for medicinal products is also likely to grow. Between 40% to 60% of the healers interviewed indicated that demand for the popular nine species assessed in the study had increased (see Figure 5.4). Furthermore, in eight of the nine species, 60% or more of the healers indicated that they were using these plants for the treatment of new diseases, such as AIDS (see Figure 5.2). Increasing urbanization is likely to fuel the demand for indigenous medicine, as urban conditions promote the spread of disease and incidence of stress-related ailments. The relatively large numbers of

young people visiting indigenous healers indicates that the culture of indigenous medicine use has not being significantly reduced through development and acculturation. This trend combined with a steadily growing population in South Africa, suggests that demand for indigenous medicine is likely to be increasing.

Healers also indicated that they required higher levels of stock for the nine popular species (see Figure 6.2).

Figure 6.1 : Percentage of healers reporting acceptability of substitute medicinal plants [n = 31]

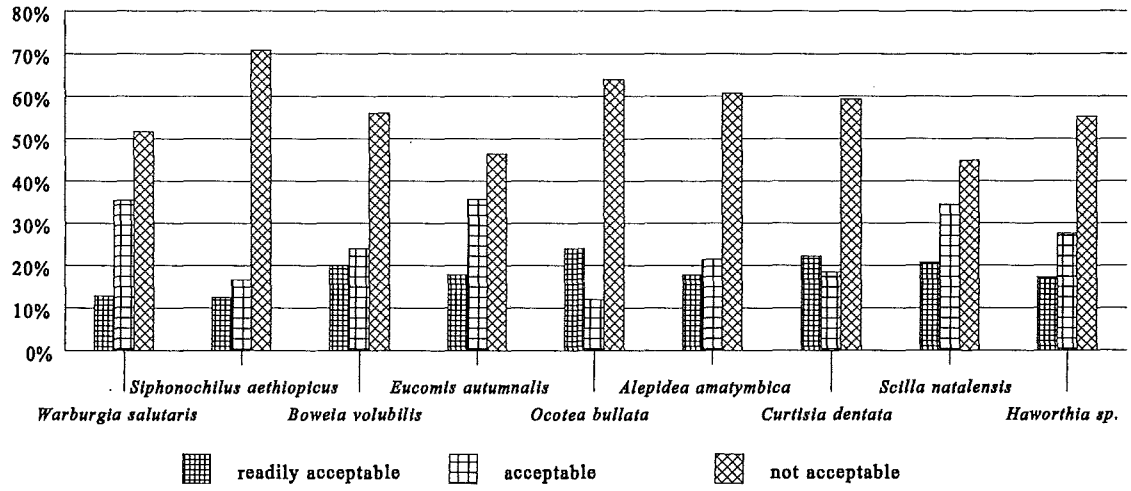
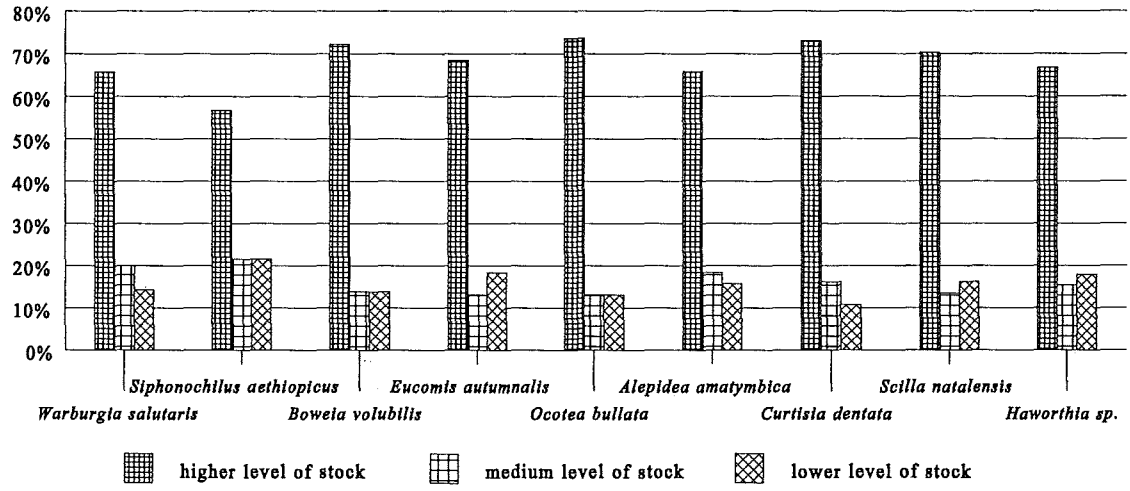


Figure 6.2 : Percentage of healers reporting on the desired level of stock of medicinal plants [n = 39]



The consumers of indigenous medicine come from a wide range of social strata, with significant differences in belief systems and buying power. However, the market only supplies a uniform range of raw or semi-processed products, with practically no choice in quality of product, processing and packaging. This implies that there are considerable opportunities to supply different types of medicinal products to suit the demands of a diverse consumer group. The market survey identified that:

100% of healers' patients wanted to be treated in more modern facilities,
99% of healers' patients wanted medicines to be certified for quality, and
98% of the patients indicated a need for hygienic and modern packaging.

There are clearly significant opportunities in the diversification of products for the market.

The use of traditional medicine is dynamic, with both consumers and healers adapting the use to new circumstances. Not only are new diseases treated but also new products may be used in the evolving practice. For example, plants alien to South Africa, such *Calamus* and *Camphor*, are incorporated into the healers' dispensary. Furthermore, there is widespread acceptance of the use the cultivated medicinal plants due to the shortages that are occurring in the market. For example, 98% of the healers' interviewed indicated that they would be interested in buying cultivated medicinal plants, and 83% said that there was no difference between cultivated and wild plants, or that they were not able to tell the difference between the two. Healers" patients indicated similar sentiments, with 94% saying that they would not change their use patterns if medicinal plants were cultivated.

Apart from local demand there is also a growing international demand, from African countries and developed countries in the north [Lange 1997]. In Africa there are similar demand patterns as in South Africa with, in many cases, greater reliance placed on indigenous medicine due to declining abilities of many governments to maintain western-based health care systems. Experiences in Mozambique, Namibia and Mali have confirmed that rural and urban populations rely on indigenous medicines [Mander 1997b; Pollett *et al.* 1996; Mander *unpublished*). A medicinal plant investigation in Namibia by the author 1996 revealed that healers' in Windhoek[12] relied on South African medicinal plants for their practices. Some healers' estimated that up to 80% of the plants they used were from South Africa. The USA, Japan, and several European countries also import South African products for research and consumption.

The above discussions on consumer demand highlights the potential in the indigenous medicine market which is attributed to:

- the considerable size of demand,
- the strong probability of a growing demand,
- a culturally entrenched demand,
- indigenous medicine is a basic consumer good,
- demand is relatively unresponsive to price changes,
- the willingness to pay high prices for more scarce items,
- there are few accepted alternatives,
- consumers prefer better quality products,
- consumers prefer more modern and hygienic packaging, dispensing locations and retail outlets,
- the dynamic nature of indigenous medicine and adaptability,
- the widespread demand for indigenous medicinal products in African and northern hemisphere countries, and
- the different standards required by different consumer groups.

6.1.2 Supply opportunities

Supply opportunities from wild plant populations (non-cultivated plant populations)

Due to the local extinctions of popular plants in areas close to urban markets, communities in remote localities in communal areas have opportunities to harvest and trade scarce plants. Some of these communal areas are located in Mozambique, Swaziland and Lesotho, and could supply scarce plant products to South African markets. The relatively high prices being paid for scarce plants offsets the greater transport costs and makes the more distant localities a feasible option. Communal areas could continue to provide an important source of plant species which are not currently in great demand. Management of these non-scarce plant populations could provide a sustainable source of material for the market. More appropriate harvesting techniques and enrichment planting could contribute to greater yields from wild populations.

[12] Windhoek, the capital city of Namibia.

Commercial farms, with valuable wild plant populations which have been relatively lightly harvested, could be managed and harvested to provide the grassland and savannah species currently demanded. Small volumes of forest species could be produced on commercial farms, and this could be enhanced through enrichment planting within existing forest areas. The higher prices paid for scarce species could help offset management costs. Furthermore, the continued importation of scarce species is likely to be limited by conservation actions and the Convention on International Trade in Endangered Species (CITES), thereby reducing foreign competition for local medicinal plant production.

State forests in the south western Cape could provide one additional source of bark for at least two of the most popular bark species. Commercial timber extraction results in the felling of mature *Ocotea bullata* and *Curtisia dentata* trees. Bark from felled trees could be harvested and transported to market outlets.

Land use changes such as dam developments, afforestation, transport infrastructure development, establishment of new crop lands and any other large-scale developments may make large numbers of doomed plants available for market supply.

Supply opportunities from cultivated plants

South Africa is endowed with sophisticated agricultural, horticultural, silvicultural, chemical processing, industrial and business technology which could contribute extensively to developing indigenous plant resources, processed products and indigenous medicine enterprises. All these industries are large, with a wide range of technologies and skills available, and could be harnessed to produce products for the indigenous medicine market.

There are several international initiatives in medicinal plant cultivation which could provide examples for local suppliers. Production initiatives in India are likely to provide the most useful insights into plant production given the similarities in the economies and cultural use of medicines in India and South Africa [Lambert *et al.* 1996].

Commercial farmers in South Africa are seeking new economic opportunities. This is due to the anticipated reduction of trade barriers that are associated with South Africa becoming a member of the General Agreement on Tariffs and Trade (GATT). There are also many progressive farmers who would be prepared to speculate on new crops. The opportunity exists for progressive farmers to enter into new economic ventures associated with the medicinal plant trade.

The opportunity exists for subsistence farmers to enter into the production of crops that have high value, such as *Siphonochilus aethiopicus* and *Haworthia limifolia*. Indigenous medicinal plants require relatively little attention, and are well suited to low input agricultural systems [Mander, Mander and Breen 1996]. These farmers are also situated within the consumer community, requiring little transport and marketing, with sales taking place at the farm gate. The land reform process in South Africa has resulted in many disadvantaged farmers acquiring previously commercial farms, and they too are seeking economically viable opportunities. The production of medicinal plants is increasingly being considered as an economic option for developing farmers [Mander, McKean, McKechnie and Makhaye 1997].

The extensive reliance on wild populations for supply, results in seasonal and scarcity-related shortages. Cultivation provides an opportunity to provide a regular supply and to make plant available at times when they would be scarce in the markets.

The current plant gatherers represent an important opportunity in the production of cultivated plants. There are an estimated 16 000 gatherers in KwaZulu-Natal who currently harvest plant material for the market. These rural women have expertise in farming given that in most subsistence households in KwaZulu-Natal, it is the women who do most of the agriculture. The gatherers also have a good understanding of the markets for plants and would be well placed to meet the demands of various user

groups. The plant species are generally restricted in distribution due to their specific habitat requirements. Gatherers understand the habitat requirements of many of the plants harvested, and therefore could also structure the cultivation systems in ways to meet plant requirements. The involvement of these women in the markets also means that the market provides an opportunity for promoting training and sharing of propagation resources, and enhancing communication and market knowledge.

A pharmacopoeia is being developed in South Africa that can help to standardize the prescription of plants and quantities used in indigenous medicines [Eagles *pers. comm.* 1997]. This will serve to promote greater degrees of self-medication, and open the market for more individually packaged products. By having a known and accepted dosage available to the market, products could be legally produced for self-medication. In a similar vein, the Medicines Control Council is expected to relax its policies governing 'folk medicine', making it easier for trade in processed indigenous medicine [Gericke *pers. comm.* 1997].

There are several organizations in the province, such as the Institute of Natural Resources and Durban Parks Department, which have been investigating the medicinal markets, testing the cultivation of medicinal species, and propagating medicinal plants for the last decade. The experiences of these organizations would provide an important resource for supporting any future production initiatives.

In summary, the opportunities for the supply side of the indigenous medicine market include:

- availability of scarce medicinal plants in remote locations,
- availability of medicinal plants on commercial farmlands,
- availability of bark products from logging operations in other parts of South Africa,
- availability of plant supply from changing land-use,
- availability of medicinal plants on managed communal lands,
- availability of a wide range of cultivation, processing, and marketing expertise,
- access to international examples of medicine production for traditional markets,
- a large demand for new agricultural opportunities on commercial farms, subsistence farms, and redistributed farms,
- availability of progressive farmers with access to resources,
- robust nature of indigenous medicinal plants which require few agricultural inputs,
- a wide range of sites for product distribution, ranging from farm gate to urban processing factories,
- ability to supply specific species at times of the year when they are usually not available,
- a large number of plant gatherers with appropriate knowledge that could promote the cultivation of plants for the market,
- an established market system that could provide a communication mechanism for any proposed market developments,
- documentation and establishment of accepted guidelines for use and dosages of medicinal plants,
- several organizations have experience in indigenous medicine markets and in the cultivation of medicinal plant species in farming and nursery systems.

6.2 Constraints

Policy constraints

National and provincial government support for the medicinal plant trade is extremely limited. The National Departments of Agriculture, Health, Trade and Industry, and Environmental Affairs and Tourism are doing little to support the medicinal plant trade in South Africa. At a provincial level in KwaZulu-Natal, the leadership within the Departments of Agriculture and Health have expressed an

interest in the trade[13]. These two large departments have no policy to support the production of materials for the trade, with all their resources focusing on conventional products. The two provincial conservation agencies in KwaZulu-Natal, have taken different actions with regards to the trade. The Natal Parks Board has recently been taking a 'hands-off' approach to the trade and has supported small-scale growers around protected areas. The KwaZulu-Natal Department of Nature Conservation has on the other hand, taken a law enforcement approach and has attempted to limit the trade in plants. The local government in Durban has perceived the medicinal trade to be a serious urban management problem, as most of the trade takes place on the streets in busy transport nodes, creating health, traffic and trade control problems.

All three tiers of government lack appropriate policies to support the medicinal plant trade. Consequently, initiatives for promoting the marketing of plants would have to develop official support. This is unlikely as there may be vested interests in all departments who would probably not support any change in the allocation of resources away from established activities. The challenge of having a previously unrecognized activity being allocated a budget, is enormous given the current priorities, established power structures, limited funds and bureaucratic momentum that exists within government departments.

Institutional constraints

The Medicines Control Council currently places restrictions on the trade in all medicines [Folb *pers. comm.* 1997]. While the medicinal plant trade has been largely informal, authorities have ignored the implementation of regulations. It is that any formalization of the trade and products would become a target of the authorities, due to the ease with which a formal establishment could be identified and prosecuted.

The previous apartheid government in South Africa contributed to the development of narrow perspective of indigenous medicine in academia, formal business, and all tiers of government. This has contributed to widespread ignorance within a wide range of institutions, and in many cases rejection, of indigenous medicine and the associated trade in products. Negative perceptions of the trade and use of indigenous plants in medicine have become entrenched within institutions in South African society, resulting in indigenous medicine becoming marginalized. There are therefore considerable barriers to any formalization of indigenous medicine and trade.

The declining supply of indigenous plants in communal lands can be strongly linked to the inability or unwillingness to enforce property rights associated with natural resources, including indigenous plants. Any management that attempts to promote the more sustained use of medicinal plants in these areas will face major constraints in that the open access or common property institutions are culturally entrenched and in most cases supported by traditional leaders.

Furthermore, the lack of property rights regarding indigenous knowledge creates considerable suspicion between the market players and outsiders, limiting the opportunities for research and development.

Constraints due to competition

This study has identified considerable competition throughout the indigenous medicine industry, including competition between healers themselves, healers and gatherers, shop traders and gatherers, pharmaceutical companies, and wholesalers. The degree of competition can often be extreme leading to intense trade secrecy or to considerable antagonism between the market players. The aggressive competition has a destructive influence on the industry with little or no cooperation taking place, and consequently there has been little development of the industry.

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[13] A result of discussions initiated by the author.

The divisive competition also weakens the lobbying ability of the industry in government, allowing the industry to be dictated to at most levels of government. Disunity within the industry promotes the marginal position of indigenous medicine in society.

Competition is likely to increase as more market players enter the market at different levels. Market observations in KwaZulu-Natal (this study) and Mapumalanga [Mander 1997a] indicate an increase in entrants and/or interest from gatherers, street traders, indigenous healers, subsistence farmers, commercial farmers, forestry companies, drug processing companies and international bio-prospectors. The increase in market players, combined with the limited stocks of plants, is likely to reduce the income per market player, especially at the gatherer and trader levels in the market.

Supply constraints

The supply of popular plant species is declining as result of intense harvesting pressure on wild populations in communal areas in the eastern region of southern Africa. The declining plant populations result in irregular supply and reduce the opportunities for developing products associated with these species. The decline in forest species is the most acute, and is further exacerbated by the long period required to grow usable trees for the market.

The intensity of use has also led to several local extinctions, resulting a decline in the genetic diversity within the species. The reduction in genetic diversity may result in the loss of valuable variations within the species that may have significant agricultural, medicinal and industrial potential.

High value plants such at *Siphonochilus aethiopicus* and *Warburgia salutaris* have been intensively harvested from a wide range of properties, including private, state and communally owned. Consequently, there are few populations of these high value plants which could form the basis of new products. The cultivation of these scarce species would probably be the only option for producing sufficient quantities for experimental processing and marketing.

There are few established indigenous medicinal plant production centres, with a few demonstration farms and nurseries producing information and source materials for interested farmers and healers.

Medicinal plants are also relatively slow-growing species with most of the popular species taking at least several years to develop to a size currently traded in the markets.

The total reliance on wild populations for market supply results in both an irregular supply of plant quality and quantity, making product and market development more difficult.

Skills constraints

There are major skills limitations in the whole area of medicinal plant production and marketing. The plant gatherers and informal traders have low literacy levels, which may limit development of the market. The introduction of new concepts, such as the large-scale cultivation of medicinal plants and the processing of raw materials, could be limited by the current skills within this group.

As the market has been largely informal and strongly traditional, there are few skills in business management, with a large number of market participants having limited understanding of the business approaches required to exploit the wide range of opportunities which are present in the market. The decline in market share that has occurred within the shop trading segment and their ineffective reaction to trying to retain their share, can be seen as an example of the limited skills available in the market.

There are also few skills available regarding the management of wild populations and the cultivation of medicinal plants within farming and conservation systems. Current harvesting has largely focused on maximizing the extraction of products for sale to the market, resulting in the establishment of

destructive harvesting approaches. The establishment of a culture of destructive harvesting is likely to limit the development of more sustainable methods in the future.

Marketing information constraints

There is little coordination in the marketing of medicinal plants and products. The most common marketing activity is practised by the healers and consumers, who may inform gatherers or traders of the plants they require. The supply of these ordered products can take a long time, with the gatherers having to return to their collecting areas and then returning to the market with the desired material, should they be able to locate the product.

In may cases, gatherers may bring materials to the market which are already available in large quantities, resulting in wastage if products are perishable, or resulting in very low prices being realized.

The street traders do not even have a telephone which gatherers could phone to enquire about the stock required in the market. The trade is largely based on chance, with gatherers not knowing (unless they have scarce plants) that they will be able to sell their products for a reasonable price. Market information is largely shared by word-of-mouth, leading to a long turn-about time in the market, contributing to a high-risk situation where suppliers may not know whether the requested products are still in demand by the time they reach the market. Many of the traders have indicated that the market requires a telephone where they can enquire about current sales and demand.

There is also little recent information available regarding the stocks of common wild bulbs and trees on commercial farms, creating an uncertain market for any cultivation initiatives and for resource management activities. Farmers cultivating medicinal plants may be competing with other farmers who may be 'mining' their plant resources, resulting in a lower prices being charged by the 'mining' system and creating substantial risks for the cultivation of medicinal plants.

The economic feasibility of cultivating plants for markets is currently unknown. There are no economic models which can identify the financial feasibility of medicinal plant species in South Africa[14]. The lack of financial models limits the willingness of financing institutions to support the indigenous medicine industry.

Spatial constraints

The dispersed nature of the wild plant resources and the demand for plants, creates a market where there is extensive transportation of materials between producers and consumers. The transport of material may also be across international boundaries, with further barriers. The marketing of plant resources from wild plant populations therefore contributes considerable costs to marketing.

In summary, the constraints facing the indigenous medicinal plant market include:

Policy constraints

- a policy environment which is negative towards the industry,
- no government recognition of the opportunities offered by medicinal plants to promote development,
- government departments who may facilitate market development already face severe budget constraints within existing priorities,
- vested interests within existing government departments to maintain the *status quo*,

[14] This market study is however part of a broader study (being undertaken by the Institute of Natural Resources) investigating the economics of cultivating medicinal plants for local markets.

- common property or open access rights regimes in large areas which frequently promote resource degradation,
- bureaucratic controls concerning the formal trade of indigenous medicines, which may limit product development to only highly sophisticated operations with massive financial resources,

Awareness limitations

- a narrow perspective of indigenous medicine in academia, business and government,

Industry development limitations

- an industry with aggressive competition within and between market segments, resulting in the industry having limited lobbying ability,
- competition which is likely to increase and reduce returns for the lower end of the market,
- competition within the industry that undermines rather than develops the industry,

Plant supply limitations

- an almost total reliance on wild harvested plants for the trade,
- declining plant populations which results in many high value species becoming increasingly inaccessible,
- diminishing product development opportunities due to limited access to sufficient plant stocks,
- local extinctions are resulting in a decline in the genetic variation within high value species,
- the supply of plant products is irregular, in quantity and quality,
- forest resources are extremely limited and will provide few of the scarce species in the future,
- the distances between major markets and various plant sources are large, generating large costs in the trade,

Production constraints

- there are few production initiatives in the province,
- many high value species are slow-growing,

Skills limitations

- the literacy of a large number of market players is poor, creating limitations for developing the industry,
- business skills are poorly developed in a number of the sectors,
- there are few skills in the sustainable use of medicinal plant resources,

Poorly developed market information systems

- there are inefficient market information sharing systems in the industry,
- there is little knowledge of the financial opportunities in cultivating and managing stocks of medicinal plant species,
- the lack of information regarding financial feasibility discourages financing institutions from supplying credit,
- there is little known of the availability and condition of plant stocks on privately owned farms.

6.3 Potential

The potentials within the medicinal plant markets are best examined in various scenarios. The potentials within the market depend on the outcomes of interaction between key uncertainties and the fixed factors in the market.

There are a number of fixed factors in the market which can also be considered the 'rules of the game'. These fixed factors are conditions in the market which are unlikely to change significantly in the short term[15], and constitute the foundation of any scenario which may develop. Such fixed factors include:

- a large and growing demand for medicinal plants,
- a steadily declining supply forest species in the short term,
- a fluctuating supply of grassland and savannah species in the short term,
- an increase in the price of scarce plants,
- the plants' environmental requirements and production potential,
- an increase in numbers and diversity of market players,
- the majority of the market players having limited business skills in the short term.

In contrast to the 'rules of the game', there are variable factors which will to a large extent determine how the market will change in the future and what potentials in the market could be achieved. In the medicinal plant trade the key variable factors are the actions of the different market players and the associated authorities. The key uncertainties include:

- the degree to which the current market players cooperate to develop a common vision and lobby for government support,
- the responses of government departments (Health, Agriculture, Trade and Industry, Water Affairs and Forestry, and Environment and Tourism) to the indigenous medicine industry,
- the responses of national, provincial, and local political leaders to the indigenous medicine industry,
- the response of formal business to the opportunities in the industry, and
- the quantities demanded by consumers for different levels of processed, certified, standardized, and packaged products.

The combinations of the 'rules of the game' with the various actions of the market players will determine the range of scenarios which could unfold.

6.3.1 The scenarios

A wide range of scenarios could develop depending on the actions of the various role players. In order to illustrate the range of possible scenarios, three scenarios will be developed and include:

- Scenario 1 - No intervention - a continuation of the current trends,
- Scenario 2 - Industry driven intervention - where big business takes the initiative,
- Scenario 3 - Collaborative intervention - where current market players, business and government cooperate.

These scenarios are gross generalizations but will serve to show potentials and as well as market needs.

6.3.1.1 Scenario 1 - No intervention - a continuation of the current trends

With a growing demand and diminishing supply, there will be an accelerated decline in the availability of popular plant species, with forest species, in particular, becoming unobtainable. Price increases will encourage the 'mining' of wild plant stocks by more sophisticated means and with greater involvement of commercial enterprises. 'Fly-by-night' operators will be encouraged, focusing on profit maximization in the short term by harvesting and trading high value species. The importation (legal and illegal) of scarce plants will increase from countries where plants continue to be available.

[15] The short term refers to a period of time within the next five years.

Excessive competition in the market is likely to increase, fuelling division within the industry. The government is unlikely to recognize and support an industry where there is considerable disunity, and it would be more inclined to focus on limiting and controlling the industry.

The lack of guaranteed quantities and quality of plant species supplied will limit the development of processed products, promoting the continued trade in raw products. Large pharmaceutical companies, with a growing interest in the indigenous medicine trade[16], are likely to focus on a narrow range of species which could be produced in the short term. Slow-growing species are unlikely to be produced by commercial enterprises.

Such a scenario will result in an industry where:

- current market players become increasingly marginalized through the declining supply of plant materials,
- commercial producers and large companies will focus their marketing at the upper end of the market with a few products, such as *Siphonochilus aethiopicus*, *Haworthia limifolia*, *Warburgia salutaris*, *Boweia volubilis* and *Alepidea amatymbica* which may provide high returns,
- government will attempt to increase their control over harvesting, trade and dispensing of plants,
- plant resources will decline and slow-growing popular species or genera, such as *Ocotea bullata*, *Curtisia dentata*, *Cassine, Boophane, Schlecterina* and *Stangeria* may disappear from markets,
- healers and small-scale farmers will produce insignificant quantities[17] of plant material for their own use or trade,
- commercial harvesters will access existing stocks of high value species in previously unexploited areas, such as commercial farms, forestry estates, and protected areas,
- lack of raw materials will promote the growth of other industries, such as first world pharmaceuticals, foreign exporting companies, and alternative synthetic producers,
- lack of raw materials will result in a decline in the industry,
- a few large producers/processors will dominate the market,
- an industry which threatens biodiversity.

The potential opportunities in this scenario will be largely concentrated within the large processing companies and their associated plant producers. Foreign exporters and commercial farmers will also have opportunities to supply raw products in the short term.

The chances of this scenario developing are relatively high while the industry remains strongly divided and is unable to develop support from, and partnerships with, commerce and government.

6.3.1.2 Scenario 2 - Industry driven intervention - where big business takes the initiative

The resurgence of intensive bio-prospecting and the increasing interest from large commercial enterprises to seek new profit-making opportunities in previously unexploited markets, will stimulate commercial enterprises in the indigenous plant trade. Declining returns to conventional agriculture will result in increased interest in medicinal plants from the commercial agriculture sector. A more unified indigenous medicine industry will encourage the development of partnerships between current market players and more developed commercial interests.

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[16] The indigenous medicine trade has been one of the few preserves of the black community which has not been penetrated by white or foreign commercial interests. With increasing access to information regarding the indigenous medicine trade, commercial businesses are becoming more interested in the large informal medicinal plant trade.

[17] While there is limited support from government, producers are unlikely to be able to grow sufficient quantities to make a significant contribution to the quantity demanded.

Partnerships between large commercial interests and current market players will combine the expertise and resources available to both groups. The land and plant resources of black communities and/or commercial farms is likely to be combined with the sophisticated skills of processing and marketing which is present in the more developed commercial sector. Such partnerships are likely to be oriented to profit maximization, will be strongly market driven and consequently will be largely focused on the fast-growing plant species. Without partnerships, there is unlikely to be sufficient support from indigenous healers for the new products, and consequently demand may not be large enough to warrant investment in cultivation and processing.

An initiative led by business is likely to promote the partial development of a small number of current market players, with the formal business interests maintaining those skills and activities which are likely to deliver the greatest returns. Furthermore, business is likely to focus on a resource exploitation and their own company development rather than on resource management and industry development.

The industry will probably focus on a range of species greater than in the first scenario due to the relatively easy access to cheap land and labour resources. Popular but slowing growing species, and less popular species are likely to continue to be harvested from wild populations, with little effort directed at management of these stocks. Farmers and communities in communal lands will be encouraged to supply raw materials, while the value-adding processes are likely to be undertaken within the sophisticated commercial processing sector.

Such a scenario is likely to result in an industry which:

- produces high value products for the upper end of the consumer market,
- produces fast-growing species, such as *Siphonochilus aethiopicus*, *Warburgia salutaris*, *Haworthia limifolia*, and *Boweia volubilis* which can be produced relatively efficiently,
- limited numbers of small-scale growers and commercial farmers become involved in the market but for the production of raw materials only,
- consumers at the bottom end of the market will continue to use a dwindling supply of wild plants,
- wild plant resources will decline and slow-growing popular species will disappear from markets,
- commercial harvesters will access existing stocks of high value species in previously unexploited areas, such as commercial farms, forestry estates, and protected areas,
- there will be a reduction in the size of the market with fewer plant gatherers and a smaller group of traders selling declining quantities of wild plants and increasing quantities of products produced by large processing companies,
- produces a range of processed products for exporting to African, American, European and Eastern markets,
- market information will be largely confidential and inaccessible to the broader market,
- is dominated by producers/processors and traders/healers from the middle to upper end of the supply trade.

The potential opportunities in this scenario will be greater than in Scenario 1, but will still be limited to a restricted number of the current market players. Beneficiation will largely occur within sophisticated businesses but with the production of plant material taking place on commercial farms for few of the highest priced plants, and developing farmers producing high and moderate priced plants. The potential opportunities of this scenario will be limited to the better-off sectors of the current market, commercial farmers, and large and intermediate processing businesses.

The chances of this scenario developing are related to the ability of commercial enterprises (which have greater skills in accessing capital, production, processing and marketing) to develop partnerships with the current market players. It is possible that collaboration may occur in certain locations or sectors of the market.

Without government support for the widespread development of skills amongst the current market players, particularly at the lower end of the supply chain, it is likely that the best scenario which could

develop would be Scenario 2. Industry development would be restricted to activities which could be profitable for the commercial sector. The sector not participating in new initiatives would probably decline and this would benefit the commercial businesses who would gain greater control over the supply of products to the indigenous medicine trade.

6.3.1.3 Scenario 3 - Collaborative intervention - where current market players, business and government collaborate

In this scenario, current market players, business and government collaborate to maximize the potential within the industry. Government recognizes the potential of the industry to promote economic development, provide wide access to affordable and culturally acceptable health care, and promote biodiversity conservation. Government develops an enabling environment for the industry through the development of appropriate national, provincial and local policies, and the allocation of resources to address development in the sectors which private enterprise would be unlikely to support. Government also supports organizations which promote the development of the industry, particularly those focusing on the less developed sectors.

In this scenario one could expect to see similar commercial activities as in Scenario 2, but with a broader participation of current market players. The development of skills at lower levels in the industry could see the development of a wide range of different resource management, production, processing and retail enterprises. A greater focus on skills development at the bottom end of the market could see individuals and cooperatives developing small enterprises that would retail products of an appropriate standard and price to the middle and lower end of the consumer market. Production could take place within the user communities, providing development opportunities and increasing access to essential medicinal products.

With appropriate assistance and direction, a wide spectrum of the market players could participate in the market, maximizing the opportunities which the industry could provide. Market information could be supplied by institutions in accessible forms, promoting the participation of a wide range of current market players in the industry. Government investment in the development of appropriate technology for production, processing and packaging could promote the participation of small-scale suppliers in the market, providing appropriately priced products for user communities.

The involvement and support of government could promote a greater focus on the management of wild stocks, support biodiversity conservation in the long term. Government could promote the production of slow-growing species which business would be less inclined to pursue. Government involvement is also likely to enforce 'rules of the game' which will result in greater responsibility towards natural resource use, intellectual property rights, and equitable partnerships agreements with less developed communities. Furthermore, the provision of incentives by government could ensure that beneficiation is optimized within rural areas and within South Africa itself, promoting a trade in high value processed products rather than a trade in low value raw materials.

Collaboration between current market players, business interests and government, could result in an industry that includes the following:

- establishment of a sustainable supply of fast- and slow-growing (*Ocotea bullata*, *Curtisia dentata*, *Bersama*) plant species,
- management and sustainable use of existing wild stocks,
- widespread cultivation of both slow- and fast-growing plant species in small- to large-scale agricultural systems,
- production of a wide range of raw materials and processed products,
- more efficient use of plant material harvested,
- more beneficiation (with greater levels of hygiene and certification) of products with better returns to suppliers and more satisfied consumers,
- greater levels of health care with more standardized quality products,

- production of goods throughout the year in different quality packaging, contents and retail outlets,
- establishment of production, processing, distribution, and retail enterprises to provide a range of goods for upper, middle and lower income consumers,
- establishment of enterprises focusing on local, national and international markets,
- provision of plants for testing, and developing market products,
- incorporation of medicinal plant production into conventional range management, forestry, horticulture and crop production programmes,
- involvement of a wide range of current market players in the diversification of the industry.

6.3.2 Summary of potential opportunities

In summary, the three scenarios offer three different potential opportunities to the market.

Scenario 1- No intervention - the continuation of the *status quo* - is likely to offer few large benefits to a few large companies, while most of the current market players continue to experience decreasing access to popular and effective plants. A narrow range of species would be cultivated, processed, and distributed for the upper end of the market. Biodiversity and health care may decline.

Scenario 2 - Industry driven intervention - collaboration between progressive current market players and big business interests - is likely to offer large benefits to large and intermediate companies and a limited number of current market players. Cultivation, processing, and distribution would occur for the middle and upper end of the market. Small-scale traders and gatherers are likely to continue to trade in wild plants, but supply is likely to decline as the consumption of cheap products continues at the lower end of the market. Biodiversity and health care may decline.

Scenario 3 - Collaborative intervention - collaboration between current market players, government and business interests - this could see the development of a wide range of processed products from simple rural products to sophisticated industrial products. Numerous market players could develop a range of different quality products for a wide range of consumers, with different prices which suite the consumers' budgets. Such a scenario, is likely to promote the growth of the industry, and promote development at a broad scale. Investment in resource management is also more likely in this scenario. Health care will also benefit.

7. ANALYSIS OF MAIN MARKETING FACTORS

The informal nature of the trade in medicinal plants influences the main marketing factors. There has been limited investment in the development of trade. Consequently, the industry is generally dominated by simple technologies, with little infrastructure specifically developed for the medicinal plant trade. The improvisation of available resources characterizes this industry.

7.1 Product description

A wide range of wild harvested medicinal plants are traded in the market. The plants are traded either in the raw form or with limited processing, and with few controls regarding quality. Products are packaged using recycled waste materials. While the processing and packaging may not be in a sophisticated form, the specificity of use of plants and the mixing of various plants for particular treatments is highly developed.

7.1.1 Types of products

Products are traded as parts of a single species or as mixtures of plant parts from many species. Over 400 species of plants are regularly traded in the markets within KwaZulu-Natal [Cunningham 1988].

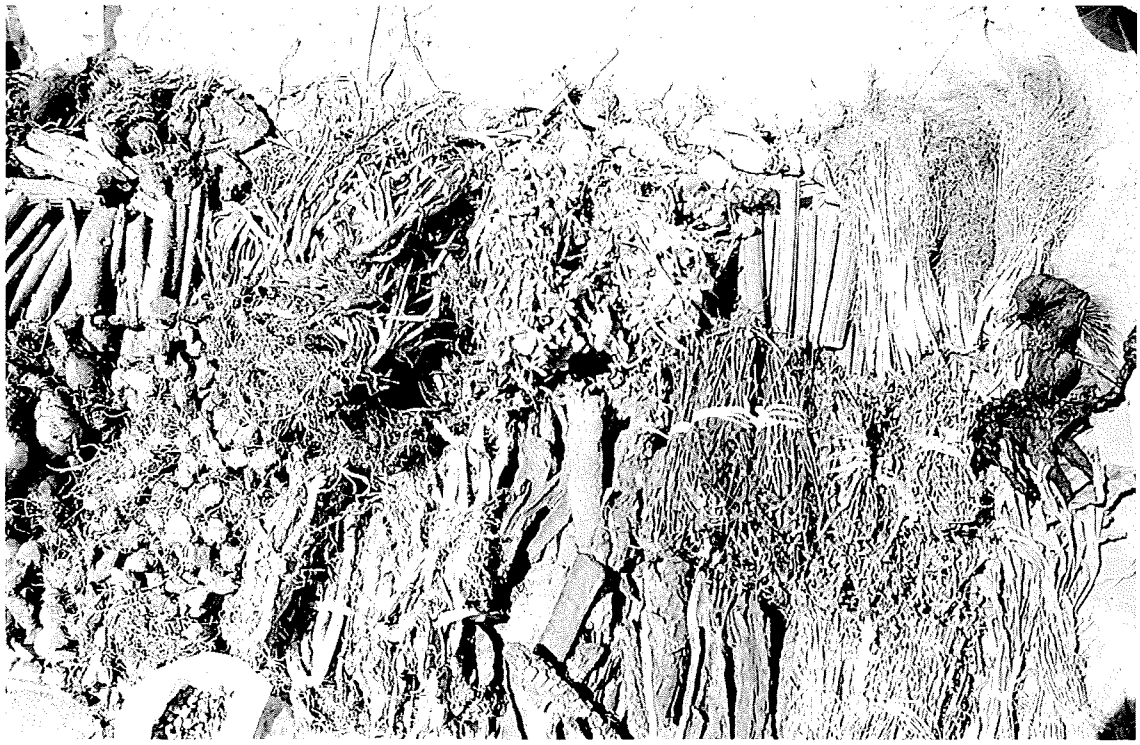


Photo 7: Fresh herbs, lianas, bark and roots are important for a number of treatments, and are frequently in short supply due to the inefficient marketing system.

Photo 8: A stall specializing in trading fresh and finely processed mixtures. These products can be sold dry for future use, or sold for immediate consumption, mixed with water in recycled liquor bottles.

Street traders and gatherers identified 70 plant products which they considered important trade products[18] (listed in Table 7.1). Three of the products were popular mixtures of different plant parts from at least 18 plant species, while the remaining products were not mixtures but were sold as individual species. The plant products/parts sold and their relative proportions traded in the street markets are illustrated in Table 7.2.

Photo 9: A popular indigenous medicine, called 'ntelezi' is being prepared on the street, and consists of a mixture of leaves, rhizomes and bulbs. This mixture is in high demand and consequently large volumes are prepared and traded daily. Such mixtures must be sold quickly otherwise they spoil in the intense heat or frequent rain.

The plants can be used individually or in sophisticated mixtures depending on the illness or condition to be treated. Some mixtures are relatively well-known recipes, such as 'ntelezi' and 'ubulawu', and are prepared for self-medication while other mixtures are complex and secret, and are only prepared and prescribed by indigenous healers. Up to 11 different plant species may be used for these more sophisticated mixtures. Plants can be used for their chemical or magical properties or for a combination of both properties.

Wholesalers sell a smaller range of plant products, with frequent use of substitute products from exotic species or from synthetic products.

A major pharmaceutical company anticipates trading ten species of plants.

[18] The survey of perspectives regarding important trade items must be considered a snap-shot of the market as surveys were only carried out once for each of the two street markets in Durban. Regular monitoring would provide a more accurate assessment of importance. Access to resources is variable, and this is likely to determine the importance of plants to traders. Should some plant be relatively scarce, then it is likely that it would loose its importance for a trader.

Table 7.1: The plants most frequently demanded by consumers [ranked according to the number of traders who identified the plants as important, and the vegetation type (biome) where the plants are found] (Grassland and woodlands = G, Forests = F)

IMPORTANT SPECIES FOR TRADE AS IDENTIFIED BY STREET TRADERS						
NUMBER	**RANK**	**BOTANICAL NAME**	**ZULU NAME**	**PART USED**	**BIOME**	**NUMBER OF TRADERS**
1	1	*Scilla natalensis*	inguduza	bulb	G	47
2	2	*Alepidea amatymbica*	ikhathazo	root	G	40
3	2	*Ocotea bullata*	unukani	bark	F	40
4	3	*Warburgia salutaris*	isibhaha	bark	G/F	37
5	4	*Eucomis autumnalis*	umathunga	bulb	G	35
6	5	*Curtisia dentata*	umlahleni	bark	F	33
7	6	*Haworthia limifolia*	umathithibala	whole plant	G	29
8	7	*Boweia volubilis*	igibisila	bulb	G	28
9	8	*Siphonochilus aethiopicus*	isiphephetho, indungulu	root	G/F	19
10	9	*Secamone gerrardii*	iphophoma	root	F	5
11	10	*Clivia miniata*	umayime	whole plant	F	4
12	10	*Dioscorea dregeana*	isidakwa	tuber	F	4
13	10	*Dioscorea sylvatica*	ingwevu, ufudu - intelezi, ugebeleweni	tuber	G	4
14	10	*Sclerocarya birrea*	umganu	bark	G	4
15	10	Mixture of plants - *Adenia gummifera, Foeniculum vulgare, Berkheya* spp., *Clivia* spp., *Drimea* sp., *Urginea* sp., *Disocorea* spp., *Eriospermum cooperi, Cephalaria natalensis, Kalanchoe* spp.	intelezi	mix of many plant parts		4
16	11	*Acacia xanthophloea*	umkhanyakude	bark	G	3
17	11	*Adenia gummifera*	impindamshaye	stem	F	3
18	11	*Burchelia bubalina*	umqonga	root	F	3

IMPORTANT SPECIES FOR TRADE AS IDENTIFIED BY STREET TRADERS						
NUMBER	**RANK**	**BOTANICAL NAME**	**ZULU NAME**	**PART USED**	**BIOME**	**NUMBER OF TRADERS**
19	11	*Callilepis laureola*	impila	root	G	3
20	11	*Harpephyllum caffrum*	umgwenya	bark	F	3
21	11	*Maytenus* sp.	ubangalala	roots	F	3
22	11	*Ornithogalum longibracteutum*	umababaza	bulb	F	3
23	12	*Albizia adianthifolia*	umgadenkawu	bark	F	2
24	12	*Cassine papillosa*	usehlulamanye	bark	F	2
25	12	*Cassine transvaalensis*	ingwavuma	bark	G	2
26	12	*Celosia trigyna*	uvelabahleke	whole plant	G	2
27	12	*Dietes* sp.	isiqunga	root	F	2
28	12	*Encephalartos* spp.	isigqiki semikhovu	stem	F	2
29	12	*Euclea divinorum*	umshekisane	root	G	2
30	12	*Gunnera* sp.	igobhe, ugobo	root	G	2
31	12	*Haemanthus albiflos*	uzaneke	bulb	F	2
32	12	*Hippobromus pauciflorus*	uqhume	root	F	2
33	12	*Jasminum angulare*	umalala	stem and leaves	G	2
34	12	*Mimusops caffra, Sideroxylon inerme*	amasethole	bark	F	2
35	12	*Ochna natalitia*	umadlozane	bark	F	2
36	12	Mixture of plants - *Maesa lanceolata, Hippobromus paucifloris, Helinus* sp., *Secamone* sp., *Bulbine latifolia, Synaptolepis kirkii*	ubulawu			2
37	13	*Acacia caffra*	umtholo	root	G	1
38	13	*Acridocarpus natalitius*	umabophe	root	F	1
39	13	*Albizia suluensis*	inyazangoma	bark	F	1

IMPORTANT SPECIES FOR TRADE AS IDENTIFIED BY STREET TRADERS						
NUMBER	**RANK**	**BOTANICAL NAME**	**ZULU NAME**	**PART USED**	**BIOME**	**NUMBER OF TRADERS**
40	13	*Albuca fastigiata*	umaphiphintelezi	bulb	G	1
41	13	*Balanities maughamii*	umgobandlovu	bark	G/F	1
42	13	*Capparis brassii*	qwaningi	stem	G/F	1
43	13	*Cryptocarya myrtifolia*	umkhondweni	bark	F	1
44	13	*Ekebergia capensis*	mnyamathi	bark	F	1
45	13	*Gasteria croucheri*	impundu	whole plant	F	1
46	13	*Gladiolus* sp.	umlunge	bulb	G	1
47	13	*Helichrysum* spp.	imphepho	whole plant	G	1
48	13	*Helinus integrifolius*	ubhubhubhu	stem	F	1
49	13	*Heteropyxis natalensis*	uhuze	bark	G	1
50	13	*Hydnora africana*	umafumbuka, umavumbuka	root	G	1
51	13	*Hypericum aethiopicum*	unsukumbili	whole plant	G	1
52	13	*Hypoxis latifolia*	ilabatheka	bulb	G	1
53	13	*Kniphofia* spp.	icacane	bulb	G	1
54	13	*Lycopodium clavatum*	inwele	whole plant	F	1
55	13	*Macaranga capensis*	umpumelelo	bark	F	1
56	13	*Maesa lanceolata*	uguqa, nhlanhlemhlophe	roots and bark	F	1
57	13	*Momordica foetida*	intshungu	leaves and stem	G/F	1
58	13	*Polygala hottentotta*	uzekane	whole plant	G	1
59	13	*Protoasparagus* sp.	isigobo	root	G	1
60	13	*Pulicaria scabra*	isithaphuka	whole plant	G	1
61	13	*Sansevieria aethiopica*	intelezi	root	G	1

IMPORTANT SPECIES FOR TRADE AS IDENTIFIED BY STREET TRADERS						
NUMBER	**RANK**	**BOTANICAL NAME**	**ZULU NAME**	**PART USED**	**BIOME**	**NUMBER OF TRADERS**
62	13	*Schotia brachypetala*	umgxamu	bark	G	1
63	13	*Stangeria eriopus*	imfingo	tuber	F	1
64	13	*Turbina oblongata*	ubhoqo	tuber	G	1
65	13	*Turraea obtusifolia*	inswazi, uswazi	root	F	1
66	13	*Turraea floribunda*	uvuma	root	F	1
67	13	*Typha latifolia*	ibhuma	root	G	1
68	13	*Urginea altissima*	umahlokolothi	bulb	G	1
69	13	*Vernonia neocorymbosa*	uhlunguhlungu	leaves and stem	G	1
70	13	Mixture of plants – *Cardiospermum* sp. and other unknown species	uzifozonke			1

Table 7.2: Plant products/part sold in the street markets

Plant parts traded	Relative proportion of the market	Form in which the product is sold	Preferred characteristics/qualities of the products
Bark	27%	Chunks (30 cm - 10 cm long 10 cm - 3 cm wide), chopped, or ground to a powder (<1 mm)	Thick bark originating from the main trunk of old trees. Age of the harvested product is not critical.
Roots	27%	Whole sections (40 cm - 10 cm long), chopped (10 mm - 5 mm long), or ground to a powder (<1 mm)	Roots which are mature but which can be easily chopped. Freshness is more important in roots.
Bulbs	14%	Whole (15 cm - 2,5 cm in diameter), sliced or chopped (2 cm - 5 mm)	The larger the bulbs the better. The outer covering should not be damaged.
Whole plants	13%	Live for planting or dried	The fresher the plants the better. The plants should be mature.
Leaves and stems	10%	Whole sections (40 cm - 10 cm long), chopped (10 mm - 5 mm long), or ground to a powder (<1 mm)	The fresher the leaves and stems the better. Younger stems are better and they should not be too woody.
Tubers	6%	Whole (40 cm - 10 cm in diameter), chunks of the tuber, slices or chopped (2 cm - 5 mm)	Tubers should be mature but not so large as to be unmanageable. Fresh tubers are preferred.
Mixtures of various plant species	4%	A range of plant parts usually chopped into 1 cm to 3 cm pieces and sold fresh (moist plant parts have not been dried), dried or bottled with various liquids.	Mixtures should be freshly prepared using plants which have the ideal characteristics indicated above.

7.1.2 Processing of products

The processing of materials generally commences with the plant gatherers removing any non-marketable material from the plant product during harvesting. Plants, such as *Haworthia limifolia* and *Gasteria croucheri* required live for the market are protected from heat and dehydration, and may be replanted at the homestead until marketed. Bark and roots are usually dried before transported to the market. Herbs, vines and grasses (and other small thin plants) are usually bound into bundles for sale.

The next phase of processing takes place within the street markets, traders' shops, healers' practices or in the wholesalers' warehouse. If plants are not sold whole or in part, then they are usually chopped into small pieces or can be further processed by grinding (see Table 7.2 for details). Plants are chopped with a cane knife (like a machete) and a piece of tree trunk as a block. Grinding is usually carried out with an effective but crudely fashioned pestle (a thick iron rod) and mortar (a thick metal pipe welded to a base plate).

Mixtures are also made at the various outlets, with the street traders making simple mixes such as intelezi, and healers making the most sophisticated mixtures[19], involving chopped, ground and burnt material. Shops and wholesalers also make mixtures for retail and may add dye and other synthetic ingredients for special effects.

[19] Mixtures produced by healers are generally secret, and this survey has made no attempt to investigate their contents. Good cooperation was received in the markets, particularly due to the absence of any investigation into the use and content of medicine mixes.

7.1.3 Grades, qualities and certification

The Medicines Control Council in South Africa has stringent regulations governing the trade in products registered or recognized as medicines [Folb *pers. comm.* 1997]. However, as indigenous medicines are not generally traded in formal markets, nor are they usually traded in packaging which claims to treat specific ailments, they have not been subject to any real control or certification. There are, however, some informal controls administered by the market players. For example, several shop traders and healers do not sell potentially lethal plants, such as *Boweia* or *Callilepis*, to consumers in a raw form.

Grading takes place in an informal manner in the markets. Different plants or their parts have 'deal' or preferred qualities which either make the product more saleable or achieve a higher price in the markets (see Table 7.2). Apart from bark products, old market material and damaged whole plants and bulbs do not sell well. In addition to the preferred characteristics, there are a few generic characteristics which are desired. It is preferred that plants are harvested from the wild as they are believed to have greater power than cultivated plants. This is more important to sangomas (diviners) than to inyangas (herbalists), as the natural environment is believed to increase the magical power of plants. Sangomas tend to require more magical properties in their practice than inyangas. However, it is important to note that should the preferred qualities not be available, then smaller, older, damaged or thinner materials are accepted.

7.1.4 Packaging

The products purchased from street traders, healers and shop traders are usually packaged in new or recycled plastic bags, old newspaper, magazine pages and an array of recycled liquor bottles. The type of package depends on the products and quantities purchased. Single items and small quantities purchased are wrapped in paper while large quantities or multiple items purchased are placed in plastic bags. Consequently, consumers tend to receive newspaper packaging while healers and traders tend to receive their goods in plastic packets. Liquid products are traded in recycled bottles, the size depending on the volume required.

Wholesale companies package their products in conventional commercial packaging, with paper bags, plastic bags, plastic bottles and cardboard boxes.

Large volumes of plants transported or purchased for resale within the informal trade, are usually packaged in recycled '50 kg' meal bags (with between a mass of 22 kg and 30 kg of plant products depending on the species). Smaller 30-kg bags are also used occasionally.

The market survey has indicated that healers' customers would prefer more modern and hygienically packaged medicines (98% of respondents) and that medicines should be certified by a healers' organization (99% of respondents).

While the demand for better packaging is strongly articulated by consumers interviewed, observations in the market indicate that there are consumers who prefer to buy products in an unprocessed form. High illiteracy levels are likely to result in consumers who prefer purchasing the product in an identifiable form or in a traditional market where they believe they would get the right treatment.

7.2 Channels of distribution

Medicinal plant products are distributed in a wide range of retail outlets, markets and locations. Markets are frequently associated with sites of informal trading and dense clusters of small shops located near public transport nodes. Retail outlets are usually associated with concentrations of consumers, either in residential areas or in 'downtown' commercial areas. The delivery of medicinal material follows established transport routes between rural and urban centres as the source of plant

supply is closely associated with rural communities who regularly travel to urban centres for work, access to social services and convenient markets.

7.2.1 Channels of marketing

Consumers can purchase medicinal products directly from the people harvesting or from various intermediaries who would have purchased from gatherers or other intermediaries. In urban centres, such as Durban, most of the trade takes place through intermediaries, while in rural areas products are bought directly from the person who gathered the plants.

Of the material consumed in Durban (through self-medication and prescription), it is estimated that 61% of the products are purchased from healers (generally intermediaries), 22% from street traders (frequently direct sales), and 17% from shop traders (intermediaries). The quantities bought from wholesalers were not disclosed, but it is probably a small percentage of the overall trade.

Photo 10: A range of bark, roots, and bulbs displayed on the sidewalk for retailing to healers, retailers and consumers.

The main marketing channels within the medicinal plant trade in KwaZulu-Natal are:

- gatherers and street traders,
- indigenous healers,
- shop traders, and
- a wholesale company.

7.2.1.1 The gatherers and street traders

The people

Between 80% to 90% of the street traders are women, originating from communal areas throughout KwaZulu-Natal, Eastern Cape, and to a lesser degree other provinces in South Africa and from neighbouring states (especially Mozambique). Street traders visit the city for a few weeks at a time to trade their goods, and then to return to their rural homes with consumer goods purchased from their earnings in the market. Many traders live on the streets with their products for the duration of their stay in the city. Similarly, traders in rural markets are mostly women, who originate from the surrounding rural areas where plants are available[20].

The location

The street traders in Durban are located in two main markets. The Ezimbuzini market is located in the periphery of a large black township (called Umlazi) and the Russel Street market is in the periphery of the Durban central business district. Russel Street is the larger market with 200-300 traders/ gatherers trading at any one time, and Ezimbuzini is a smaller market with 60-80 traders/gatherers in the market. These two markets are located at major transport nodes where commuters catch taxis or busses for intra- and inter-city destinations. There are numerous small street markets (of ten or less traders) in most towns in the province, generally located near public transport nodes.

In rural areas, informal markets are located at trading sites, such as cattle sale lots and administrative centres.

The number of traders

In Durban, it is estimated that there are between 7 000 to 8 000 gatherers that service the market, with between 400 and 500 people undertaking the street trade. These estimates could probably be doubled for the province of KwaZulu-Natal. The 26% and 31% of the street traders in Ezimbuzini and Russel Street markets respectively, were relatively permanent traders.

The retail infrastructure

At present the street markets in Durban are situated immediately adjacent to busy roads. Most traders simply trade their goods from the pavement or bare ground. Several traders have erected wood and tin huts for trading and storage purposes or plastic sheets are used to cover the products at night and from

[20] The rural traders and gatherers are a similar group to the street traders and gatherers, the only difference being that the rural traders sell their products in rural markets and not in the large urban centres. The general approach in these rural markets is for traders (mainly women) to take their products to market days, and then to return home at end of the trading day. These people trade in smaller volumes as they only trade for one day at a time. Market days are generally associated with state pension pay-out days. An important feeder market for Durban is the Mona market near Nongoma in northern KwaZulu-Natal. This market may have between 50 to 100 people trading medicinal plants. The source of plants for this market is from the immediate region, southern Mozambique, southern Swaziland, and northern Free State province. The rural markets serves both local consumers and various traders, including healers, shop traders and street traders from a wider region. The numbers of rural traders in KwaZulu-Natal is unknown.

rain. Many of the traders sleep at the street stalls under plastic sheets. Rural markets are situated in convenient open areas associated with some form of commercial or administrative activity.

The clients

The street markets play both a local and regional retailing and wholesale role, which includes supplying wholesale products to healers and shops, and retail products to end consumers. Russel Street trades a large percentage of material to consumers, while Ezimbuzini trades a greater proportion to healers and shop traders. Buyers will buy *en route* to work, while at work or they make specific trips to the traders sites to make purchases. It is estimated that 1.8 million purchases[21] are made in the Durban street markets per year.

The products traded

Over 400 species are traded in these markets in both wholesale and retail form. Products are sold in both the whole form or in a semi-processed form, where products are chopped into small pieces. Simple well-known mixtures are also prepared and traded. The gatherers/street traders usually trade plant species which they are able to locate in the areas they are familiar with. Failing to obtain popular plants, gatherers may purchase plants from other gatherers to increase their range of products in the market.

The quantities traded

At Ezimbuzini there was ± 30 kg of plant material per trader on display, with ± 224 bags stored in the market, with an estimated average mass of 15 kg each. The total mass of plant products in the Ezimbuzini market was estimated to be ± 6.9 tonnes. In Ezimbuzini there are generally greater volumes on display and stored, than in Russel Street. The Ezimbuzini market is more inclined to wholesale plant products than Russel Street.

Russel Street had smaller quantities on display (± 10 kg), with an average of two sacks stored (± 30 kg) per trader. The total mass of material in the Russel Street market was estimated to be 13.5 tonnes. The Russel Street market functions largely as a chemist, selling small volumes to a large number of people. The average mass of a traded product was 217 g in the Russel Street market. The lower volumes of plants on display and stored per trader in Russel Street relative to Ezimbuzini, and the limited use of plastic bags and sacks for product packaging in Russel Street when compared to Ezimbuzini, further supports the notion that Russel Street acts largely as an outlet to end users and Ezimbuzini is more inclined to wholesale to intermediaries.

In terms of turnover, it is estimated that in Russel Street between 10 tonnes and 15 tonnes are traded weekly, and would amount to between 490 tonnes and 730 tonnes per annum. At Ezimbuzini, it is estimated that between 5 tonnes and 7 tonnes are traded weekly, with the annual trade estimated to be between 250 tonnes and 340 tonnes [22]. The street markets are estimated to trade some 66% of the total volume of plant material traded in Durban.

The timing of sales

Trading on the street markets is most active at the end of the month, with a peak towards the Christmas break. The markets also increase in size towards the end of the month. In terms of weekly

[21] This estimate is based on the quantities of plant material purchased by end consumers, traders and healers and the average mass of a purchase made by the respective buyers.

[22] These estimates are based on the reported number of sacks traded per week in the markets. McKean *pers. comm.* 1996 estimates an average mass of 23.5 kg per sack of plant material being transported to the Durban markets. This estimate is based on a sample of 50 sacks containing 36 plant species.

sales, markets are most active on Saturdays, Fridays, and Mondays. The most active trading activity took place between 10h00 and 16h00 during the day.

The timing of purchases or harvesting

There were no direct observations regarding the timing of harvesting, but it is probably most intensive during the early part of the month when there are less traders and consumers in the markets. Intra-market trading is likely to be most active after the end of the month, when traders are preparing to leave the market to head home.

The product suppliers

Approximately 30% of the street traders would obtain their products from gatherers, while the remaining traders gather plant material themselves.

The traders purchasing power

The mean monthly incomes for individual traders in Emzimbuzini and Russel Street are US$ 67 (R 300) and US$ 98 (R 440), respectively. While these incomes are low, relative to minimum wages, they do not seem to limit the ability of some street traders to purchase and resell popular plants. For example, in Russel Street, 51% of the traders had *Warburgia salutaris* in stock. However, only 6% of the traders reported that they collected this species, while 45% of the traders in the market indicated that they bought their stock.

7.2.1.2 The indigenous healers

The people

Indigenous healers are a diverse group of people from a wide background, including males, females, poorly educated, highly educated, wealthy and poor, urban and rural. The common factor amongst the healers is a calling from the Ancestors, which directs them to practise as either a herbalist (inyanga) or a diviner (insangoma).

The location

Healers' practices are located in areas where their clients work, live or travel, such as residential townships, commercial centres, rural homesteads and street markets. Practices tend to be located in the 'down market' commercial areas and in historically black townships. A large number of practices is located in homesteads, either rural or urban, given that a large number of healers practise part-time.

The number of healers

KwaZulu-Natal has a large number of healers in, with estimates varying between 7 600 and 15 600[23]. In Durban, it is estimated that there could be approximately 1 500 full-time healers practising.

[23] The estimate made by Cunningham [1988] that some 15 600 healers were present in KwaZulu-Natal was based on a reported ratio between the number of healers and an associated population in Zimbabwe [Gelfand *et al.* 1985]. However, this market study found that there were considerable differences in the number of patients that a healer may see in a day, varying between an average of two patients in rural areas to an average of ten in urban areas. The number of healers, therefore, does not give an indication of the magnitude of the services provided by healers. Furthermore, the study was not able to obtain any membership list of healers' associations that would support the healers' reported membership numbers. Consequently, in order to make some quantitative assessment of the magnitude of traditional healing, the study used the consumers' annual visits to healers in conjunction with the average number of patients which a Durban and rural healer would see in a day, to provide an indication of the minimum number of healers (7 600).

The retail infrastructure

The retail or practice infrastructure varies according to the location of trading. In townships, practices tend to be in modest consulting rooms or within simple homesteads. Some of the more wealthy healers may have elaborate consulting rooms situated on their private property. In street markets, the practice may consist of a low table with chairs in the street or they may have a small shack where they practise. Rural healers tend to have a separate traditional hut as a consulting room, associated within the homestead. Practices may have a large number of both plants and dead animals on display.

The clients

The healers' clients are both consumers wanting to purchase a product without a prescription and patients requiring a consultation with a prescribed medicine. As many healers are located within residential areas, clients are attracted to purchase from them due to convenience. In addition, some consumers are reluctant to purchase medicine from the street markets for various reasons including:

- the 'unhealthy' way which medicine is placed on the streets,
- they may not wish to be seen buying indigenous medicine on the street,
- they may not have confidence in the street traders' ability to treat their illness, or
- they may have built up a patient/healer relationship with a healer which suited them more.

It is estimated that for Durban there are some 1.3 million healers' patients, accounting for approximately 4.3 million visits to healers per year. In KwaZulu-Natal, it is estimated that there are 3.8 million healers' patients, making a total of 12.5 million visits to healers a year.

The products traded

Plants are used to treat a range of ailments from typical everyday ailments like colds and backache, to psychological and socio-economic problems. As discussed previously, over 400 plant species are traded. However, as numerous healers' prescriptions involve the complex mixing of different species, up to 11 species in some products, there are probably many hundreds more products than species traded. These products range from simple raw products, for example whole plants, through to complex mixtures of ground and burnt plants. Animal products may also be added to such mixtures.

The quantities traded

Healers are estimated to trade over 900 tonnes of plant material per year in Durban. Products are traded in a range of quantities, from a teaspoon-full to a large shopping bag, depending on the client's needs.

The quantities demanded

Healers reported that they bought on average 7 bags of plant material per month, ranging between 1 and 16 bags. The average bag weighs 23.5 kg. Quantities demanded are probably greater than quantities traded as there is considerable wastage in the industry.

The timing of sales

As with the street traders, healers are most busy towards the end of the month, with a peak at the Christmas break. Healers report that they are relatively uniformly busy during the weekdays, but are busier on Saturdays. Unlike the street markets, healers are frequently busy from 07h30 in the morning. This may be due to the fact that many healers operate within the townships, consequently healers are immediately accessible to clients, unlike the city markets which are a time-consuming taxi journey away from the residential areas.

The timing of purchases

Healers report that they purchase materials whenever an important product is either finished or close to being sold out. They may therefore arrange for purchases to be made any time of the month. However, important items, such as *Warburgia salutaris*, may be stockpiled to ensure that a continuous supply is always available at the practice. However, apart from unplanned purchases of depleted essential plant products, there is a tendency for healers to make general stock purchases on Mondays.

Gatherers trading plants may also arrive at the healer's practice anytime during the month, but with a peak towards the end of the month.

The product suppliers

Healers purchase material from street markets, gatherers, and wholesale companies. Scarce species are usually bought from street markets as these markets have the greatest variety and the largest supply network of all suppliers. Healers also have gatherers which regularly supply their practices with raw materials. Healers in remote areas may also purchase certain materials from wholesale companies. Rural markets are also visited on occasions to obtain products which may not be available in the Durban markets.

The healers' purchasing power

The healers' reported incomes range between less than US$ 44 per month (less than R 200) to more than US$ 667 per month (more than R 3 000), with 61% of the healers reporting that they earned between US$ 44 (R 200) and US$ 222 (R 1 000) per month. These figures are probably underestimates of income and therefore purchasing power, as income is usually under-reported. Many urban healers have vehicles (including 4X4 pick-ups, with one healer reported to own his own light aircraft) showing that there is a wide range in purchasing power of this group. The majority of healers are not wealthy, and have limited economic power to develop their business.

7.2.1.3 The shop traders

The people

In the past shop traders were largely people of Asian-Indian descent. However, this is now changing with black shop owners entering the market. Indian traders do, however, make up the majority of shop owners at present. Many of the shops have been established for decades and are usually associated with a family tradition in the medicinal plant trade.

The location

Most medicine shops (usually referred to as muthi shops in South Africa, and pronounced *mootee*) are located in 'downtown' areas, close to transport nodes and areas where a large number of stores cater for the black consumer trade.

The number of shop traders

There were 51 shops trading in Durban and another 61 in the rest of KwaZulu-Natal [Cunningham 1988], with a total of 111 for the province. This estimate, while being nine years old, is probably a good reflection of the current number due to the lack of growth in the shop trade as a result of increasing competition from street traders.

The retail infrastructure

The shops are normally established within shopping centres, and consist of a shop with counters, extensive shelves to keep stacks of different plants, and a back-area where processing takes place. The shops have extensive displays of plant and animal products.

The clients

Shop clients are similar to the street and healers' clients, and are often people who do not wish to be seen buying medicines in public places. Healers also buy from shops, but in declining volumes due to a narrow product range relative to the street trade. The street trade is now more preferred by healers for purchases. A few of the shops act as wholesalers to other shop owners.

The Durban shops are estimated to serve some 2.7 million customers per annum (or approximately 53 000 customers per shop per year)[24]. The total for the province is unknown.

The products traded

A wide range of medicinal products are traded, including raw materials, processed materials (such as chopped barks and standard mixes), and patent medicines. The different cultural backgrounds of the shop traders and clients reduces the range of ailments which the shop traders may treat. Most of the customers ask for a specific medicine by name.

The quantities traded

In the past, shop traders sold most of the 'unprescribed' plant medicines in Durban and in other urban centres. However, shop traders have now lost a significant proportion of their trade to street traders. It is estimated that the shop traders sell some 340 tonnes per year. The average mass of product units sold by the shop traders is 83 g, with an average of 1.5 items (or 127 g) bought per visit.

The timing of sales

Sales usually peak towards the end of the month in association with pay-day. Shop traders usually follow conventional trading hours, that is, between 08h00 and 17h00 on weekdays and between 08h00 and 13h00 on Saturday.

The timing of purchases

Shop traders reported that they replace stock as it runs out, but that stock purchases are frequently made on Mondays (as with the healers). Traders purchased products from gatherers hawking throughout the month, with a peak in quiet street trade periods, such as in poor weather and in the middle of the month.

The product suppliers

Shop traders purchase largely from street traders and gatherers. Some of the gatherers are hawkers, while others may have a direct association with the shop trader. Shop traders may also obtain material from a local wholesaler or from other shop traders. In Durban, there are two shop traders who were identified that also wholesaled to other shops. The 'wholesale' shop traders purchased materials from a range of sources, including shops in other provinces.

[24] This may be an over-estimate given that bulk purchases are made by healers and that this estimate is based on end consumers' purchases.

The traders' purchasing power

The shop traders indicated that their average turnover was US$ 3 100 (R 14 000) per month for plants traded. These traders therefore have significant purchasing power compared to the other traders in the industry.

7.2.1.4 The wholesale/mail-order supplier

The people

In KwaZulu-Natal there is one well-known wholesale/mail-order business operating and it is owned and run by a white family with Asian associates.

The location

The mail-order business has a warehouse in an industrial area of Pinetown, a satellite town in Durban.

The number of traders

Although there is only one wholesale/mail-order business operating permanently in the province, there are occasional reports of other small enterprises entering the mail-order market but with little permanence. There is at least one other large mail-order outlet at the national level, and is located in Johannesburg.

The retail infrastructure

The wholesale/mail-order business has a relatively large warehouse (some 20 × 30 metres), with processing and packaging equipment.

The clients

The wholesalers' clients are mostly medicine retailer shops, general wholesalers who trade to rural stores, indigenous healers and individual buyers. The most important clients are the shops and general wholesalers. The clients are from a wide geographic base, including most provinces in South Africa and Namibia.

The products traded

The company sells a wide range of products, including patent medicines, indigenous plants, various standard plant mixtures, ceremonial oils, powders, synthetic animal fats, charms, animal products, and incense. Scarce and perishable[25] plants are not traded due to the problems of irregular supply and product decomposition, respectively.

The quantities demanded

The quantities of products traded are not known. However, from observations made of the stock and reported trade at the warehouse, it is thought that between 20 and 40 tonnes of plant material may be traded per year.

[25] Perishable plants refer to plants with fleshy parts that are consumed fresh and which therefore are not suited for storage for long periods.

The timing of sales

The demand for plant material is reported to peak at the end of the month, and towards the end of the year.

The timing of purchases

Purchases are made when stocks are required, and this is likely to be made throughout the month with a peak after the end of the month.

The product suppliers

The wholesale/mail-order company obtains most of their supplies from Asian shop traders both in Durban and Gauteng.

The traders' purchasing power

The turnover in the wholesale company is not known, but they have significant purchasing power given the observed stocks and business infrastructure.

7.2.1.5 Major pharmaceutical companies

As there is considerable secrecy associated with the current production of medicines for the indigenous medicine market in South Africa, there is little information available. The drug companies are likely to be focusing on the upper end of the consumer market, where customers are willing to spend considerably more money for higher standard products. The companies are also likely to produce a narrow range of products which can be registered with the Medicines Control Council. Commercial growers who would guarantee specified supply conditions will largely supply materials.

These drug companies have enormous resources available to them given their major roles in the local and international pharmaceutical trade.

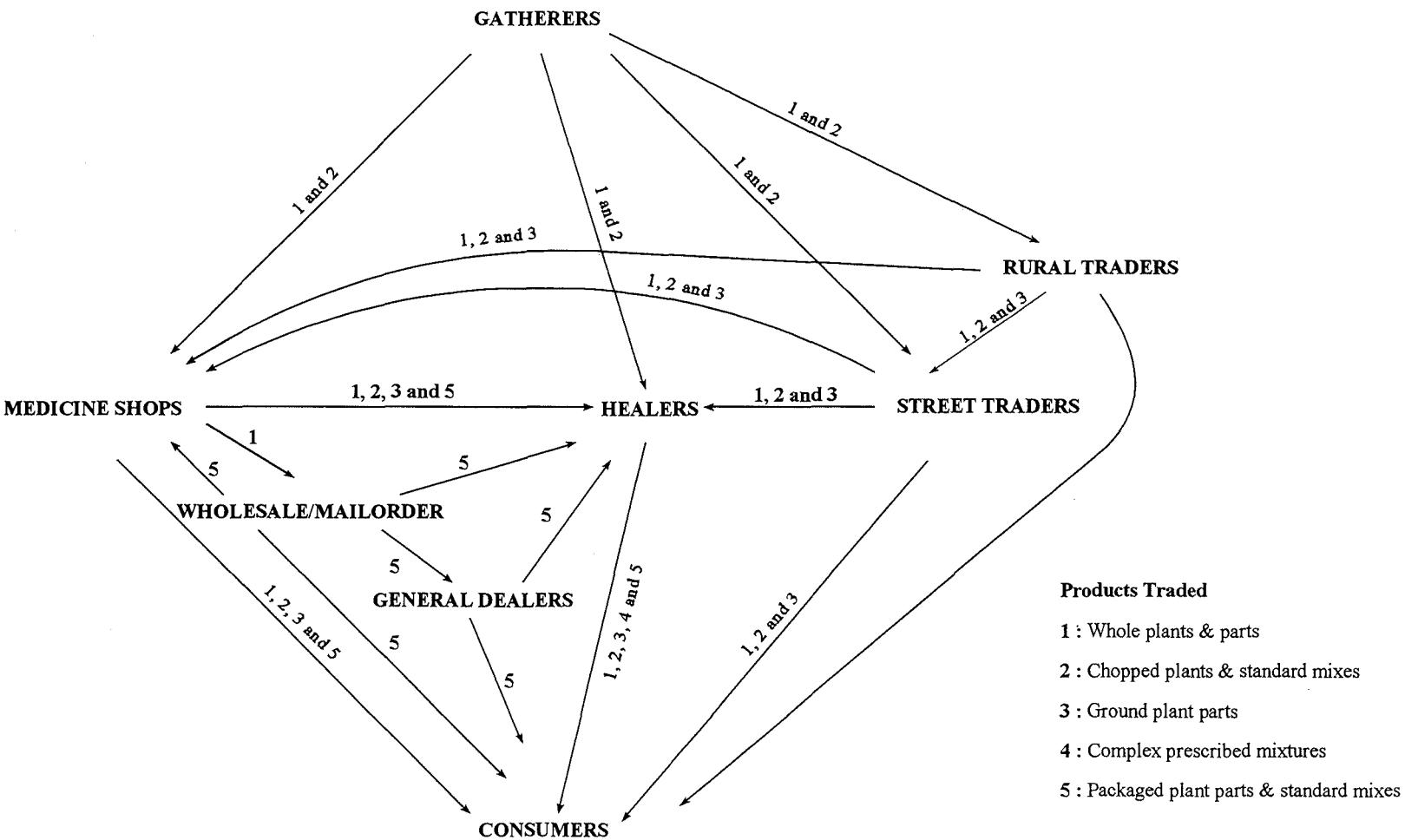
7.2.2 Channels of delivery

Delivery of products takes place largely through an extensive network of individuals trading small volumes with other individuals, in an informal manner. While the volume of trade at an individual level is relatively small, great volumes are delivered, transported and stored at the industry level.

7.2.2.1 Delivery routes

There are seven major role players in the delivery of products to consumers, and include gatherers, street traders, rural traders, healers, medicine shops, wholesaler/mail-order, and general dealers (Figure 7.1). The healers trade the largest volume of products, being largely at the centre of the trade. In Durban, at least half of the plant products traded to consumers is via healers, with the remaining volume traded via other retailers. The healers also trade the greatest variety of products to consumers. The street traders and the shop traders, are the second most important traders in the industry. The healers, shop traders, and street traders and rural traders are the core delivery nodes in the industry. Gatherers are the first step in the delivery system, supplying to mainly the street and rural markets, the healers and the shop traders. These intermediaries, then trade extensively amongst themselves (see Figure 7.1), before finally selling to an end consumer. The wholesaler/mail-order company buys exclusively from shop traders, and they in turn may sell to general dealers, healers, shop traders and on a limited scale to end consumers.

Figure 7.1 : Distribution channels and products distributed : General patterns



Some delivery routes may only involve one intermediary before the consumer, such as gatherers selling to the healer who in turn sells to the consumer. On the other hand, some routes may involve up to six intermediaries before the sale to the consumer takes place. These long routes usually involve the sale of packaged products which have been sold by the wholesaler/mail-order company. The majority of routes are likely to include two or three intermediaries, generally including rural traders, street traders, shop traders and healers.

The wholesaler/mail-order company and general dealer only buy and sell one category of products. Healers will buy and sell the greatest variety of products, and are the only market players which trade in complex prescribed mixtures. A detailed description of delivery patterns and the products traded is illustrated in Figure 7.1.

In summary, all plants originate from rural areas and may be delivered in three distinct routes. Firstly, a moderate range of products can be supplied to rural consumers via a few intermediaries such as rural markets and healers. Secondly, a wide range of products can be supplied to urban and rural consumers via a few or many intermediaries such as urban and rural healers, street traders and shop traders. Thirdly, a narrow range of packaged products can reach consumers via many intermediaries including general dealers, healers, shop traders and wholesale/mail-order.

7.2.2.2 Storage

Gatherers usually build up stocks at the rural homestead before an order can be supplied or before there is a sufficient volume to warrant a journey to the market. The amount stored is unknown but it is likely to be the total of the material which the street traders retail. In Russel Street, for example, each trader has approximately 10 kg on display and 30 kg in storage. The total mass of plants stored in the Russel Street market is estimated to be 13.5 tonnes (see Section 7.2.1.1), with a value of US$ 45 000 (R 200 000). The amount of material stored in the shops is variable, but may be as high as 2 tonnes.

Photo 11: Street trading, product storage and in many cases temporary accommodation, has a precarious existence on the sidewalk at a large and busy traffic intersection and inner-city transport node.

Raw materials for trading (rather than retailing) such as whole plants, parts of plants and chopped plants, are stored in recycled plastic woven sacks (50 kg capacity). This form of storage is used in all marketing channels. Sacks are usually stored in a dry place to prevent the decomposition of materials. Shops and healers' practices usually have a room or area set aside for stacking a large number of these bags. Street traders store their sacks under plastic sheets in the streets. Although in some towns, street traders have managed to obtain a shipping container, which is used to store many people's sacks at night.

Materials for sale to consumers, are stored in a variety of containers depending on the retail outlet. Street markets store the displayed products either on a plastic sheet on the pavement or in plastic supermarket bags (if the product is small or partially processed). In shops and healers' practices, products are usually stored in shelves or 'pigeon holes' where the wide array of materials can be kept relatively neat and separated.

Photo 12: Plants not being displayed are stored on the sidewalk in large sacks. People who sleep on the sidewalk guard the stored stocks for other traders.

7.2.2.3 Transport

Gatherers transport the harvested products from the site of harvest to their homesteads by walking and carrying the sacks on top of their heads. Several harvesting trips are made before sufficient material has been collected to warrant a trip to the market. Materials are transported to the rural and urban markets, healers and traders shops by either bus (where the sacks are tied to the roof) or by mini-bus taxis (where the sacks are stored in the taxi and the gatherer pays for the seat/s occupied by the sacks). Most of the raw materials in the market are transported in this way.

Shop traders and wealthy healers use pick-ups to collect material from street and rural markets or to visit remote areas with groups of gatherers for harvesting at some particular site. Shop traders buying from other cities rely on trucking companies to transport the sacks for them. Healers without their own vehicles travel to the various outlets by taxi and bus, or they may send 'runners' by taxi to the market

to buy material. In some cases, healers may send the patient to the market to purchase the necessary products which are then taken back to the healer for preparation.

The wholesale/mail-order company transports their products mainly by delivery vehicle, or by post.

7.3 Promotion

There is little promotion of the industry by both the market participants and by any government departments. The only official promotion that has occurred is in Durban where the local government has promoted the cultivation of medicinal plants and is now building a market specifically for the medicinal plant traders.

7.3.1 Promotion by the industry

The gatherers, street traders and rural traders all rely on local knowledge of markets for promoting their trade. Word-of-mouth is used to share information about their products. For example, when seeking a scarce plant in the market, some trader may know which other trader often sells the plant or else the trader will shout out the plant name and someone in the market may respond, knowing something about the supply of that particular product. Gatherers may go around asking shops if they would like to buy some of their products. This is the extent of promotion that occurs within these marketing channels.

Shop traders and healers have sign on their shop windows and may have small advertising boards in adjacent streets. Little printed promotion takes place. The wholesale/mail-order company has the most sophisticated promotion strategy in the region, and this involves the production and distribution of a product catalogue and an associated price list. They do little advertising, and it may be difficult to locate a catalogue unless one has the contact number of the company.

Photo 13: A wide range of coarsely chopped bark neatly displayed and ready for retailing. This material can be used as is by consumers or may be further ground by healers for creating sophisticated prescriptions for patients.

There are a number of healers' organizations which attempt to promote the industry, However, in most cases the organizations promote their own organization's agenda, resulting in division within the industry as a whole.

The pharmaceutical companies which are now focusing on indigenous medicine products are likely to have an extensive promotion campaign as their new products enter the market.

7.3.2 Promotion by government

In terms of official promotion, the Department of Health is attempting to create regulations to govern the activities of healers. This could go some way to promote the professionalism within the sector. However, there appears to be strong political alignments associated with the proposed healers' councils and this is likely to limit their acceptance by the broader industry. There have also been some initiatives considering the issue of intellectual property rights, but these have not had a significant impact on the practice of indigenous medicine. Apart from these activities, there has been little national or provincial government promotion of the industry.

However, at a local government level there has been greater support for indigenous medicine. Durban City has promoted the cultivation of medicinal plants for a number of years and has the largest medicinal nursery in South Africa. Silverglen Medicinal Nursery supplies plants to healers and interested people at subsidized prices. In addition, the street trade in Durban is being promoted through the construction of a market specifically for indigenous medicine trade. Durban City Health Department has recognized the role which healers play in the health care system and are working towards greater cooperation with indigenous healers. To this end, the Health Department supports the Traditional Healers Umbrella Body, a group which consists of a wide range of healers' organizations which deals with healers and health interests in the city and in the province as a whole.

7.4 Prices

The prices in the markets will be discussed according to the main points of sale, including the rural and street markets, the shop traders and healers, and the wholesale/mail-order company. Prices for products in the informal sectors of the medicinal plant market were highly variable. Products were traded in units of handfuls, bowls, bags and sacks. The wholesale purchasing of large volumes (bags and sacks) was usually associated with aggressive bargaining and it was not possible to ascertain realistic selling prices for bulk purchases. However, traders were helpful in disclosing the prices which they paid for bulk purchases. Retailing prices were relatively easy to estimate by purchasing products and by weighing products for sale that were displayed.

7.4.1 The rural and street market prices

In the rural markets, plants were generally sold in small quantities to consumers, small-scale traders and healers, with unit prices varying between R 3 and R 10[26] (see Table 7.3). Prices per kilogram for products in the rural markets were the cheapest relative to any other markets (Table 7.3).

The urban street markets have the same unit prices for a wide range of products, with many goods being traded in convenient coinage units, such as R 2 and R 5. However, the mass per unit of product purchased differs, with distinct prices per kilogram (Table 7.3). Common plants such as *Scilla natalensis* which are relatively cheap (between R 1.89/kg and R 6.80/kg) are sold in large units (large bulbs with a mean mass of 416.6 g), while scarce plants such as *Siphonochilus aethiopicus*, which are expensive (R 140.45/kg) are sold in small units (small rhizomes with a mean mass of 35.6 g). Large and expensive plant products are usually cut into smaller affordable pieces.

[26] An exchange rate of SA Rands 4.5 : US$ 1 is used in this report (in 1996 prices).

Street market products are more expensive than rural market products, with an increase in prices of between 25% and 260% (for five selected species) and an average increase of 111% (Table 7.3).

Table 7.3: Prices in rural and urban street markets (Units are retailed by either handfuls or bowl. Wholesale prices could not be determined in the market without bargaining)

Species traded	Rural trade - retail		Street trade - retail		Increase in selling price - rural to street markets
	Unit price†	Price/kg	Unit price	Price/kg	
Warburgia salutaris	5.00	8.52	2.00	16.88	(8.36) - 98%
Siphonochilus aethiopicus			5.00	140.45	
Boweia volubilis	10.00	11.74	2.00	14.65	(2.91) - 25%
Eucomis autumnalis			2.00	6.20	
Ocotea bullata			2.00	6.67	
Alepidea amatymbica	10.00	11.68	2.00	16.06	(4.38) - 38%
Curtisia dentata	3.00	3.28	2.00	7.61	(4.33) - 132%
Scilla natalensis	3.00	1.89	2.85	6.80	(4.91) - 260%
Haworthia limifolia			2.00	30.77	

† All prices are in SA Rands, with R 4.50 : US$ 1

Photo 14: The Mona market in Zululand which takes place monthly on pension and cattle auction days. Buyers and sellers come from a wide range of rural and urban areas to engage in trade.

7.4.2 The prices of shop traders and healers

Shop traders and healers[27] reported that they purchased their products in large sacks (containing between 23 kg (bark) and 30 kg (bulbs) of material) for unit prices ranging between R 50 and R 100 (see Table 7.4), with the price per kilogram ranging between R 1.67/kg and R 4.44/kg for selected species purchased. Bulk purchases (plants in sacks) were either bought from the street traders or directly from gatherers. *Haworthia limifolia* and *Siphonochilus aethiopicus* are generally not available in large quantities and have to be bought at street prices (the same price consumers would pay).

Healers sell products in both prescribed and self-medication forms. The prescribed products are sold with a consultation, and the average price in Durban is R 37. Products not prescribed are sold in a similar manner to the shop trader and is discussed below.

Table 7.4: Prices in shop traders' and healers' markets (Units are bought wholesale by the sack and retailed by the handful or bowl)

Species traded	Shop and healers - buying by sack		Shop and healers - retailing by handful		Mark up in price - from buying to selling
	Unit price†	Price/kg	Unit price	Price/kg	
Warburgia salutaris	100.00	4.44	1.40	31.16	(26.72) - 601%
Siphonochilus aethiopicus	5.00 per plant	140.45 (street)	2.70	450.00	(309.55) - 220%
Bowiea volubilis	80.00	2.67	3.10	27.80	(25.13) - 941%
Eucomis autumnalis	50.00	1.67	1.82	10.66	(8.99) - 538%
Ocotea bullata	55.00	2.89	1.40	27.71	(24.82) - 859%
Alepidea amatymbica	50.00	1.67	1.20	17.84	(16.17) - 968%
Curtisia dentata	50.00	2.22	1.04	23.85	(21.63) - 974%
Scilla natalensis	50.00	1.67	1.43	6.46	(4.73) - 283%
Haworthia limifolia	2.00 per plant	30.77 (street)	3.25	69.15	(38.38) - 125%

† All prices are in SA Rands, with R 4.50 : US$ 1

The shop traders' prices for products (the nine species studied) ranged between R 1.04 and R 3.10 per unit, and between R 6.46/kg to R 450/kg (see Table 7.4). As in the street trade, *Scilla natalensis* is the cheapest popular product per kilogram, while *Siphonochilus aethiopicus* is the most expensive plant product per kilogram. The mark up in price was considerably greater than in the street markets, with a range of between 125% and 974%, and a mean of 612%.

7.4.3 The wholesale/mail-order prices

The wholesale/mail-order company reported that they bought sacks of material exclusively from shop traders for between R 75 and R 95, depending on the species. The more scarce species, such as *Warburgia salutaris* and *Eucomis autumnalis* cost R 95 a sack, while the less scarce popular species, such as *Ocotea bullata* and *Scilla natalensis* were bought for R 85 per sack (see Table 7.5). The range in prices paid for the popular plants was between R 4.20/kg and R 2.80/kg. Relatively scarce species, such as *Siphonochilus aethiopicus* and *Haworthia limifolia* were not traded by the wholesaler and therefore the range in wholesale prices is more limited than in the other traders.

[27] Shop traders and healers are treated in the same chapter as their purchasing strategies are similar. In terms of sales, they sell at similar prices when selling 'non-prescription' products. Furthermore, it was not possible to measure the masses of products being added to mixtures in prescription products, and consequently the survey has used the shop traders volumes and prices for estimating sales to consumers at both shop traders and healers marketing channels.

The prices charged for non-processed plant products ranged between R 7.66/kg and R 26.85/kg when packaged, with a mark up of between 174% and 539% (Table 7.5). However, packaged standard mixtures had greater prices. For example, one popular mix (sifazonke mpupu) was sold for R 33.36 per 600 g units (12 × 50 g sachets), or R 55.60/kg. The mix of species used in this product is unknown, however, assuming that the price paid for the raw plant materials was the same as for the most expensive species (R 4.20/kg), then the mark up in price could be at least 1 233% for a product that is semi-processed and packaged.

7.4.4 Summary of prices

The price per kilogram of non-processed plants sold in the market was the cheapest in rural markets, followed by street markets, the wholesaler and finally the shop traders and healers (see Table 7.6). The highest prices paid for products was for *Siphonochilus aethiopicus* sold in the traders' shops and healers' practices.

The average mark up in prices for raw products varied from 111% at the street market, to 342% at the wholesaler, to 612% at the shop traders (and healers) (see Table 7.7). However, the greatest mark up in price was for packaged semi-processed products (over 1 200%) sold by the wholesaler.

Table 7.5: Prices in the wholesale trade (units are bought by sack and sold by small packaged quantities)

Species traded	Wholesaler - buying by sack		Wholesaler - selling by small quantities		Mark up in price - from buying to selling
	Unit price†	Price/kg	Unit price	Price/kg	
Warburgia salutaris	95.00	4.20	14.93	26.85	(22.65) - 539%
Siphonochilus aethiopicus					
Bowiea volubilis					
Eucomis autumnalis	95.00	3.16	14.93	8.53	(5.37) - 170%
Ocotea bullata	85.00	3.70	14.93	21.64	(17.94) - 485%
Alepidea amatymbica					
Curtisia dentata					
Scilla natalensis	85.00	2.80	14.93	7.66	(4.86) - 174%
Haworthia limifolia					

† All prices are in SA Rands, with R 4.50 : US$ 1

Table 7.6: A comparison of retail prices in different market channels†

Species traded	Rural market retail R/kg	Street market retail R/kg	Shops/healer retail R/kg	Wholesale retail R/kg
Warburgia salutaris	8.52	16.88	31.16	26.85
Siphonochilus aethiopicus		140.45	450.00	
Bowiea volubilis	11.74	14.65	27.80	
Eucomis autumnalis		6.20	10.66	8.53
Ocotea bullata		6.67	27.71	21.64
Alepidea amatymbica	11.68	16.06	17.84	
Curtisia dentata	3.28	7.61	23.85	
Scilla natalensis	1.89	6.80	6.46	7.66
Haworthia limifolia		30.77	69.15	

† All prices are in SA Rands per kilogram, with R 4.50 : US$ 1

Table 7.7: A comparison of price mark ups for raw products traded in the main market channels[†]

Species traded	Street trade price mark up (R/kg and %)	Shops and healers price mark up (R/kg and %)	Wholesale price mark up (R/kg and %)
Warburgia salutaris	(8.36) - 98%	(26.72) - 601%	(22.65) - 539%
Siphonochilus aethiopicus		(309.55) - 220%	
Bowiea volubilis	(2.91) - 25%	(25.13) - 941%	
Eucomis autumnalis		(8.99) - 538%	(5.37) - 170%
Ocotea bullata		(24.82) - 859%	(17.94) - 485%
Alepidea amatymbica	(4.38) - 38%	(16.17) - 968%	
Curtisia dentata	(4.33) - 132%	(21.63) - 974%	
Scilla natalensis	(4.91) - 260%	(4.73) - 283%	(4.86) - 174%
Haworthia limifolia		(38.38) - 125%	

[†] All prices are in SA Rands, with R 4.50 : US$ 1

8. INSTITUTIONAL AND INFRA-STRUCTURAL SUPPORT TO MARKETING

Support for indigenous medicine marketing is limited in KwaZulu-Natal and in South Africa as a whole. There has been little recognition of the potential benefits of indigenous medicine practice and trade by both government and formal business. Most of the actions focused towards indigenous medicine have generally attempted to limit the perceived negative aspects of the trade. Consequently, the industry has remained largely informal and undeveloped, despite being an industry of considerable size, economic value and cultural importance.

8.1 Institutions involved and their respective roles

In KwaZulu-Natal there is only one organization which focuses exclusively on supporting the marketing of indigenous medicine. The KwaZulu-Natal Herb and Traditional African Medicines Traders Association was established in 1976 by traders of Asian descent, to support their activities in marketing indigenous plants for medicine and to deal as a unified group with the conservation authorities which regularly tried to limit their medicinal plant trading activities [Govender *pers. comm.* 1996]. The association played a prominent role in the industry for over a decade while the shop traders dominated the trade in medicinal plants. This organization has however declined in market power as the street traders have captured an increasing share of the market.

There are a range of other organizations which indirectly support the marketing of medicinal plants in KwaZulu-Natal, and include indigenous healers organizations, a union, research institutes, and local and provincial government departments.

There are at least ten healers organizations in KwaZulu-Natal which serve the interests of their members. However, these organizations focus on providing accreditation for the practising healers, and seldom concern themselves with the business of trade and marketing. Accreditation does, however, lend respectability to the healers and this helps in their practice. There is, however, aggressive competition between healers organizations, limiting their potential role to serve the industry.

The provincial health authorities are currently developing a Traditional Healers Council, which they hope will promote a more professional healing practice [Baloyi *pers. comm.* 1997]. This council could help in reducing poor practice and could reverse negative perceptions of the indigenous medicine industry, and in turn support medicinal plant marketing.

At the local government level, Durban City has been active in trying to develop a more hygienic traditional medicine marketing system in the city street markets [Robinson *pers. comm.* 1997]. The

City Health Department has been trying to improve the standard of health in trading and healing practice. Traders have been encouraged to clean their packaging and healers are trained to reduce the threat of epidemiological infections through the sterilization of various instruments, especially blades [Mkhize *pers. comm.* 1997]. Furthermore, the Health Department has successfully established the Traditional Healers Umbrella Body, an organization that draws together the various healers organizations and other interested parties in the industry. The Informal Trade and Small Business Department of Durban City has been working towards the establishment of a traditional medicines market, thereby reducing the need to trade on the street pavements [Botha *pers. comm.* 1997]. Construction of a market, specifically for indigenous medicine, commenced in 1997.

Durban City has also been at the forefront of promoting the cultivation of indigenous medicinal plants. In 1980 the City Parks Department recognized the problem of dwindling plant supplies and established Silverglen Medicinal Nursery [Symmonds *pers. comm.* 1997]. They have pioneered the propagation of numerous high value medicinal species and provide an important resource for propagation stock for the province, thereby promoting the availability of plants for trade.

The Self-Employed Women's Union (SEWU) has also developed in recent years to support women in informal trade. This organization does not concern itself with marketing development, but rather focuses on issues facing gatherers in the market [Xaba *pers. comm.* 1997]. This organization is currently involved in trying to resolve the issue of accommodation and retail outlets for women trading in the Durban streets.

The Warwick Avenue Street Committee has developed in the last year to address concerns facing the various healers and gatherers trading in the largest street market (Russel Street market) in Durban and the province [Dube *pers. comm.* 1997].

The Natal Parks Board has recently initiated a number of projects to promote the cultivation of medicinal plants by healers. However, the Board also undertakes a law enforcement role which limits the trade in wild plants in the short term, but promotes the plant trade in the long term.

The Institute of Natural Resources is a non-governmental organization (NGO) that has, amongst other activities, been promoting the cultivation of medicinal plants (since the 1980s) by small-scale farmers, healers, commercial farmers, government departments, other NGOs and conservation agencies. Information developed as a result of research into the markets and production of medicinal plants have been used in various forms to advocate cultivation programmes with stakeholders in the province and further afield.

8.2 Policy support

There is little formal policy at present specifically supporting the marketing of indigenous medicinal plants at a national and provincial level. In KwaZulu-Natal there is policy support at the local government level, with Durban City promoting the production of medicinal plants and the construction of a market for the street traders, while the Pietermaritzburg City Council is promoting the production of medicinal plants. At the provincial government level, the Natal Parks Board is promoting the cultivation of medicinal plants.

There are several indirect policy initiatives which may support the marketing of indigenous medicinal plants by attempting to improve the standard of indigenous medicine practice.

There are also initiatives at a national level to control bioprospecting and to ensure that the benefits of prospecting are somehow directed back to indigenous healers [Wynberg *pers. comm.* 1997]. Some of these benefits may be translated into supporting the marketing of medicinal plants.

8.3 Regulatory and control mechanisms

There are several local, provincial, national and international regulatory and control mechanisms which influence the marketing of indigenous medicinal plants. However, most of these mechanisms limit rather than support the marketing of plants.

At a local level, there are restrictions governing general trading activities in urban and rural areas. Municipal by-laws (1995), the Businesses Act (1991) and tribal regulations determine when and where products may be traded. These regulations and the degree to which they are applied vary between different areas. In South Africa, the change in government from a Eurocentric to an Afrocentric approach has promoted informal trading and along with it, the trade in indigenous plants.

At the provincial level there is the Nature Conservation Ordinance which places strict limitations on the trade in indigenous plant species. The control system functions by placing a blanket restriction on the trade of most important trade species, with the opportunity for exemptions to be negotiated with the authorities [Snyman *pers. comm.* 1997]. The legislation is generally directed at limiting trade rather than supporting the marketing of plants.

Plant species are either classified as controlled, protected and specially protected species [McKean and Scott-Shaw *pers. comm.* 1997] (see Appendix 2). Protected and specially protected species may not be traded, imported and exported without permits. However, most of the current traders do not have permits. Eight of the top ten species traded are illegal to harvest and purchase without authorization permits, and 23 of the top 70 trade products contain either protected or specially protected species. These restrictions also apply to protected plants imported into the province from neighbouring countries such as Mozambique and Swaziland. The importing agency would require an export permit from the country of origin before the plants' importation would be allowed by the provincial conservation authorities.

Any trade in protected species requires that the conservation authority be satisfied that the plants are obtained from legitimate sources, such as nurseries. As all previous legislation has largely focused on stopping trade, it is likely that there will be a period of extensive negotiations and evaluations before a procedure is developed to manage the use of species from legal sources.

Also at the provincial level the proposed Healers Council and its accreditation procedures are likely to promote a more responsible practice and promote the sustainability of the indigenous medicine industry in the long term. However, in the short term, controls may restrict the number of accredited practitioners.

At a national level, the Medicines Control Council (MCC) is a major role player in the regulation of any medicines produced and traded [Folb *pers. comm.* 1997]. Any product which is sold with either a stated or implicit medical purpose, has to satisfy the MCC standards regarding safety, efficacy and quality [Gericke *pers. comm.* 1997]. The establishment of standards is likely to promote long-term sustainability in industry, however the costs of testing products and meeting the MCC's required standards, may prohibit all but the largest drug companies from marketing products legally. The MCC could therefore be a major limitation in the low-cost production and marketing of these medicinal plants.

In practice, the MCC has not focused on indigenous medicine, however, it is legally bound to do so should it receive any complaints from the public [Gericke *pers. comm.* 1997]. There is currently a dualism in the application of regulations between western (and other medicines) and indigenous medicine. This would probably change if large-scale production of indigenous medicines took place in more formal (and easier to control) establishments. The legislation could be used by large manufacturers with resources to limit the activities of potential competitors which do not have the resources to do extensive testing and 'high tech' production.

The MCC is, however, in the process of reviewing the sphere of 'folk' medicine, with a view to taking a more lenient approach. This review is expected to be completed in the next two to three years [Gericke *pers. comm.* 1997].

Internationally, there are also controlling mechanisms which promote and limit trade. South Africa's affiliation to the General Agreement on Tariffs and Trade (GATT) will limit restrictions on trade in plants, while on the other hand the Convention on International Trade in Endangered Species (CITES) will limit the trade of scarce species [Newton *pers. comm.* 1997]. There are also phytosanitary controls which theoretically limit the movement of plant products into South Africa from neighbouring states.

In summary, there are few mechanisms which in reality support the marketing of indigenous plants in South Africa. There are, however, numerous controls which are designed to reduce the trade in indigenous plants but these are not implemented effectively at present due the informal nature of the medicine trade. These controls are likely to present significant stumbling blocks for any emergent commercial enterprises which may develop in a more formal way.

8.4 Peoples participation

The indigenous medicine industry has been largely dominated by the participation of individuals or micro-enterprises and only recently have large commercial enterprises entered the market. The industry can therefore be considered as a peoples' industry where the 'small man' or woman, have been the key role players. There are approximately 16 000 gatherers in KwaZulu-Natal, most of them being women (Section 7.2.1.1), with another 8 000 to 16 000 people practising as healers in the province (Section 7.2.1.2).

There has been little collaboration by this group to address their common interests in the market. One group, the Self-Employed Women's Union, has emerged and does go some way to promote the interests of women in the industry. The support for this group is however not unanimous, with many women preferring to operate as individuals.

8.5 Research

A survey of work being undertaken in the sphere of indigenous plant use in southern Africa [Hale *et al.* 1995] indicated that there were some 179 projects focusing on various aspects indigenous medicine in South Africa. The major *foci* of workers was chemical/pharmacological analysis (35% of projects) and the identification of uses (20% of projects) (see Table 8.1). Interestingly, the important aspects of trade, such as trade patterns, economics, legal issues and communication, together only constitute 6% of all the projects. The preponderance of chemical screening and identification projects indicates the strong bias of workers towards micro-components of the trade, while the low percentage focusing on trade issues indicates that understanding the system of medicinal plant trade is not a priority for most workers.

The implications of this bias is that most efforts and investments (private and state funds) are being directed at identifying **potential** opportunities for either individuals or a limited number of beneficiaries. On the other hand, there is little effort and investment in promoting the development of the **current** market players (who are generally the least well off in the community) and in improving the quality of medicinal plant products **currently** consumed by many millions of people.

Since 1995, there have been several initiatives which have gone some way to address the imbalance discussed above. Important research in marketing and product development is discussed in the following sub-sections.

Table 8.1: Project activities and their relative numbers [Hale, Bunker and De Beer 1995]

Project activities	Number of projects
Chemical and pharmacological analysis/screening	62
Identification and recording of uses	35
Horticulture and cultivation	14
Propagation	12
Conservation and harvesting	10
Databases	8
Trade analysis	6
Education	6
Communication facilitation	2
Legal concerns	2
Economic analysis	1
Marketing	0

8.5.1 Research in marketing

In terms of support for marketing of medicinal plants, there has been limited but significant research in the last few years.

The Institute of Natural Resources (INR) initiated market research in the late 1980s, with a report produced by Tony Cunningham [1988] focusing on the medicinal plant trade in KwaZulu-Natal, the implication of the trade, and management options for addressing issues in the trade. Following on from this work, the INR undertook small-scale cultivation trials for selected species and initiated a suite of projects looking at the economics of cultivating indigenous medicinal plants for markets, including the potential yields of cultivated plants, the costs of producing such plants, and a market survey (being this study). The INR has also investigated the trade in medicinal plants (and animals) at a national level, compiling a data base of the species used, including relevant market and conservation information.

The Botany Department at the University of the Witwatersrand has been investigating the trade in medicinal plants in the Gauteng province and the production potential of selected species, with a view of assessing the sustainability of harvesting wild populations [Williams *pers. comm.* 1997].

8.6 Product development

There are numerous initiatives throughout South Africa which are focusing on the identification and understanding of phytochemicals, an important first step in product development. However, most of the real product development is happening within a small number of pharmaceutical companies. The leading company, South African Druggists, is focusing on developing products for the indigenous medicine trade, while most other research initiatives are focusing on products for more sophisticated medicine markets [Gericke *pers. comm.* 1997].

The Pharmacology Department at the University of Cape Town has initiated a project called TRAMED, which has focused on the development of a large database containing phytochemical information [Folb *pers. comm.* 1997] and will assist in reducing repetitive research.

The Department of Pharmacy at the University of the Western Cape is in the process of documenting the formulae of indigenous medicines to create a pharmacopoeia of traditional medicine [Eagles *pers. comm.* 1997]. This will help standardize the application of medicines, promote the retail of more self-medication and increase the safety of indigenous medicines dispensed.

The National Botanical Institute is currently developing a national medicinal plants data base which will include a range of data useful for the medicinal plant industry in the future [Crouch *pers. comm.* 1997].

A large number of university botany departments throughout South Africa has been researching the propagation of important medicinal species which provide valuable information for future cultivation initiatives.

At present there is no product development taking place which supports the current market players and promotes the welfare of current users. This leads to a situation where the knowledge of the current market players is being used to promote the interests of new and sophisticated entrants to the market, with little returns to the current market players.

8.7 Marketing information systems

The market information systems are undeveloped in the indigenous medicine trade. Most of the information sharing that takes place is via direct communication in the market place. The shop traders and wholesale/mail-order company will however communicate their needs to each other via the telephone or by post. There is little public access to market information, and most information is passed between individuals making a deal. Over- and under-supply occur frequently within the market.

8.8 Education and training (capacity building)

There are few opportunities for training and capacity building for small-scale producers in KwaZulu-Natal. Silverglen Medicinal Nursery offers short courses to healers, gatherers, and interested public to train in the propagation of medicinal species. This training is currently being expanded to incorporate low input farming techniques, which can be utilized by the majority of people active in the industry. The Institute of Natural Resources has produced a handbook on the cultivation of 31 of the most popular medicinal species in eastern South Africa, and this is being distributed by a number institutions for education and training purposes.

There are currently no opportunities in KwaZulu-Natal for small-scale growers/producers to be trained in the marketing of either medicinal or conventional agricultural crops [Erskine *pers. comm.* 1997].

8.9 Extension services

There are few formally constituted extension programmes regarding the production of medicinal products for the indigenous medicine industry. The Institute of Natural Resources undertook a small project to encourage the cultivation of medicinal plants within a limited geographical area, and continues this on a small scale at present. The Natal Parks Board has expanded this extension programme by introducing the concept of cultivating indigenous medicinal plants into their nature conservation extension programme. As a result there are several small initiatives throughout the province, especially in communities associated with protected areas.

The Department of Agriculture has a large number of extension officers in the province, who with appropriate training and support, could promote the development of the medicinal plant industry in the region.

9. CONCLUSIONS

9.1 The demand for indigenous medicines

The demand for indigenous medicines and services is considerable, relative to the demand for western health care services. The black population in Durban indicated that they relied on both health care systems, with 60% of the health care services demanded coming from western health care systems and 40% of the services demanded coming from indigenous medicine. As indigenous medicine is based almost entirely on the use of indigenous plants, a massive demand is generated in terms of both number and mass of plants used.

The value of raw products consumed is considerable. In KwaZulu-Natal, the value of the trade in raw products are worth US$ 13 million (R 60 million) a year, around one-third of the value of the annual maize harvest in the province (one of the largest crops in the province). Households were estimated to be spending between 4% to 8% of their annual incomes on indigenous medicine services.

The demand for medicinal plants is likely to remain buoyant in the future. Consumers indicated that indigenous medicine was not an inferior good and demand is unlikely to decline should income levels and welfare increase in the future. On the contrary, urban consumers indicated that indigenous medicine was more expensive than the subsidized western health services provided by the government, yet they reported that they would be likely to either maintain or increase the frequency of use in the future.

Consumers also indicated that western medicine was not an alternative to indigenous medicine and that irrespective of price, they would have to continue to use indigenous medicine. There are a wide range of ailments and needs which cannot be adequately addressed by western medicine. This implies that indigenous medicine is a basic consumer good, essential for the welfare of black households.

The AIDS pandemic in the region, and the growing international demand for South African medicinal products, is likely to increase the demand for indigenous medicine products in the future.

This market study has been pioneering in terms of developing a broad understanding of consumer demand, showing that there has been considerable ignorance regarding the demand for indigenous medicine and the associated plants in South Africa. This indicates that South African society has failed to openly discuss and develop a thorough understanding of the demand for indigenous medicine. Consequently, there has been little investment at a formal level in society to address any issues associated with consumer demand.

9.2 The supply of indigenous medicines

The indigenous medicine market is based on indigenous plants which are generally harvested from wild plant stocks throughout the province and within the broader region, including neighbouring provinces and other countries. The plant stocks and the harvesting of these stocks are not managed and little cultivation takes place. The combination of high demand and the lack of any significant resource management or production, has resulted in a decline in the available plant stocks.

A wide range of plant species is showing indications of unsustainable use, with the size of the products decreasing, distances to stocks increasing, supply becoming increasingly irregular, and/or some plants becoming unavailable in certain markets. Some popular plants have become extinct outside of protected areas in the province. The supply of indigenous medicinal plants is clearly not sustainable with the current harvesting strategies.

The scarcity of popular plants has led to their under-supply in the market, with considerable increases in product prices, imports into the province, and the use of substitute plants. In addition, there has been an increase in the application of destructive harvesting techniques, which aim at maximizing the

harvest from the declining plant stocks in order to maintain income levels in the short term. The supply of popular plant products to the market is declining.

There are however options for sustaining the supply of plants to markets. There are extensive areas of grasslands, woodlands and thickets on private property that have not been intensively harvested in the past. With effective management, these areas could supply a range of products to the markets in the long term. However, the volumes of plant resources available and the harvesting strategies which may be applied need to be investigated. In terms of forest species, there are limited forest areas available and consequently management of existing stocks is unlikely to supply the quantities demanded by the market. In addition, the most popular plants, irrespective of their habitat, exist in such small quantities that management of existing stocks is unlikely to meet market demand.

The cultivation, management and enrichment planting of high value plants is therefore an important strategy to meet consumer demand and to reduce the impacts of the market on biodiversity. The success of cultivation trials undertaken to date have shown good potential for this strategy. Fast-growing species could be supplied in sufficient quantities within a few years. However, the slow-growing popular trees are unlikely to supply the bark quantities demanded in the short term, and alternative products from these plants need to be investigated.

9.3 The marketing of indigenous medicinal plant products

Over 400 species of plants are marketed in large quantities within KwaZulu-Natal. While the mixing and prescription of plant products is sophisticated, the processing and development of products is extremely limited. There is little processing and value-added to products, with most products sold in the raw form. The most sophisticated product form is a mixture of ground plants. There is little differentiation in product quality and packaging. The entire industry is dominated by simple technology, and by making use of available resources. Most of the value is added when medicines are prescribed by an indigenous healer.

The simple plant products are marketed to consumers, either as self-medication or through healers' prescriptions. The products are marketed within the residential areas dominated by black consumers or in transport nodes throughout urban and rural areas. The conditions in the markets are generally poor, with almost all the consumers indicating that they would prefer more modernized and hygienic conditions. The lack of storage facilities and trading infrastructure frequently results in the spoiling of raw material resulting in wastage and/or a decrease in product quality. Both the healers and consumers have indicated that they are concerned about the quality of the products purchased in these markets.

There is currently no certification of indigenous medicines traded, however, there is a legislation in place which requires the registration of products traded as medicines. The legislation is not currently applied to the indigenous medicine industry due to the informal nature of the trade. This legislation may limit investment in the formal cultivation of plants for the indigenous medicine industry. Unless the current legislation is changed, the production of plants for local markets may have to be limited.

The supply of quality plant products is not only critical for the welfare of millions of consumers, but it is also critical for the welfare of all the people employed in the industry. In KwaZulu-Natal there are between 20 000 and 30 000 people who derive an income trading indigenous plants in some form. Importantly, most of the people involved are black rural women, who are the most marginalized group in South African society. The medicinal plant industry therefore plays a critical role in empowering a large number of rural women.

Overall, the marketing of medicinal plants is poorly developed. Consumers and traders in plant products could benefit considerably through the development of both the products and markets.

9.4 Institutional support for the marketing of indigenous medicinal plants

In terms of policy support, very little policy has been developed to support the marketing of indigenous plants. Most of the policy has been developed to limit the marketing of plants. There are several regulatory mechanisms (associated with first world standards for medicines and biodiversity priorities) in place but are not being implemented at present. These regulatory mechanisms could however threaten any development emerging from within the industry that may occur with limited resources and which may not meet the required standards of existing legislation. On the other hand, wealthy corporations are unlikely to be as negatively impacted by the existing regulations due to their ability to comply with the high standards stipulated by authorities.

As a result of a largely negative policy environment, there has been insignificant education, training and extension regarding medicinal plant markets. Some efforts have been directed at training market players in the cultivation of medicinal plants but it is insignificant relative to the market size.

Furthermore, most research and development support from government and business has been directed at bio-prospecting and pharmacological investigations, with product development being pursued by major pharmaceutical companies. There are few efforts directed at developing the current markets, their associated products, infrastructure and market players. There is an imbalance in support for indigenous medicine, with most investment directed at seeking commercially useful chemicals within medicinal plants, while little or no investment is being directed to maintain or increase the benefits which the current market is already delivering to society.

The lack of development within the indigenous medicine market in South Africa has also resulted in little information being developed that is useful to the market players. Market information systems are poorly developed, resulting in considerable inefficiency within the markets. Market resources are wasted through inefficient coordination of trade activities. This is particularly problematic given the already short supply of plants and the inability of the current market players to absorb costs.

There is acute competition within the markets and this limits the sharing of knowledge between market players, especially the healers. The lack of sharing limits the development of the indigenous healing profession, with healers largely relying on their own or their mentors' experiences. There is no literature available at present which healers can use as a reference for administering indigenous medicine. One research group in South Africa is presently developing a pharmacopoeia for indigenous medicine. This will help in the development of products for the market by understanding the quantities required for various treatments. However, with over 400 plant species traded, the completion of this task is unlikely to be achieved in the short to medium term.

At the market level, there has been little development due to competition and the under-developed capacity of most market players. With high levels of illiteracy and few business skills, the industry has been unable to develop. In terms of the healers, there are numerous healers' organizations which serve the healers' interests. However, as they focus largely on healing issues, little investment is made at an industry level.

The combination of a negative policy environment and the limited capacity of market players to cooperate and promote their own development has resulted in an industry which is large but grossly underdeveloped.

9.5 Opportunities and constraints in the medicinal plant markets

There are a number of opportunities and constraints which have been identified in the market study. These are summarized below and form the basis for making recommendations for further action in the markets.

The opportunities associated with consumer demand in the indigenous medicine market include:

- strong probability of a growing demand,
- a culturally entrenched demand,
- indigenous medicine is a basic consumer good,
- demand is relatively unresponsive to price changes,
- willingness to pay high prices for more scarce items,
- there are few accepted alternatives,
- consumers prefer better quality products,
- consumers prefer more modern and hygienic packaging, dispensing locations and retail outlets,
- dynamic nature of indigenous medicine and adaptability,
- widespread demand for indigenous medicinal products in African and northern hemisphere countries, and
- different standards required by different consumer groups.

The opportunities on the supply side of the indigenous medicine market include:

- availability of scarce medicinal plants in remote locations,
- availability of medicinal plants on commercial farmlands,
- availability of bark products from logging operations in other parts of South Africa,
- availability of plant supply from changing land-use,
- availability of medicinal plants on managed communal lands,
- availability of a wide range of cultivation, processing, and marketing expertise in other sectors,
- access to international examples of medicine production for traditional markets,
- a large demand for new agricultural opportunities on commercial farms, subsistence farms, and redistributed farms,
- availability of progressive farmers with access to resources,
- robust nature of indigenous medicinal plants which require few agricultural inputs,
- wide range of sites for product distribution, ranging from the farm gate to urban processing factories,
- ability to supply specific species at times of the year when they are usually not available,
- a large number of plant gatherers with appropriate knowledge that could promote the cultivation of plants for the market,
- an established market system that could provide communication mechanisms for any proposed market developments,
- documentation and establishment of accepted guidelines for use and dosages of medicinal plants, and
- several organizations have experience in indigenous medicine markets and in the cultivation of medicinal plant species in farming and nursery systems.

The constraints facing the indigenous medicinal plant market include:

- a policy environment which is negative towards the industry,
- absence of a coherent strategy for transforming the industry into one which is sustainable,
- no government recognition of the opportunities offered by medicinal plants to promote development,
- government departments who may facilitate market development already face severe budget constraints within existing priorities,
- vested interests within existing government departments to maintain the *status quo*,
- common property or open access rights regimes in large areas which frequently promote resource degradation,
- bureaucratic controls concerning the formal trade of indigenous medicines, which may limit product development to only highly sophisticated operations with massive financial resources,

- a narrow perspective of indigenous medicine in academia, business and government,
- an industry with aggressive competition within and between market segments, resulting in the industry having limited lobbying ability,
- competition which is likely to increase and reduce returns for the lower end of the market,
- competition within the industry that undermines rather than develops the industry,
- an almost total reliance on wild harvested plants for the trade,
- declining plant populations which results in many high value species becoming increasingly inaccessible,
- diminishing product development opportunities due to limited access to sufficient plant stocks,
- local extinctions are resulting in a decline in the genetic variation within high value species,
- supply of plant products is irregular, in quantity and quality,
- forest resources are extremely limited and will provide few of the scarce species in the future,
- there are few production initiatives in the province,
- many high value species are slow-growing,
- literacy of a large number of market players is poor, creating limitations for developing the industry,
- business skills are poorly developed in a number of the sectors,
- there are few skills in the sustainable use of medicinal plant resources,
- there are inefficient market information sharing systems in the industry,
- there is little knowledge of the financial opportunities in cultivating and managing stocks of medicinal plant species,
- lack of information regarding financial feasibility discourages financing institutions from supplying credit,
- there is little known of the condition of plant stocks on privately owned farms,
- distances between major markets and various plant sources are large, generating large costs in the trade, and
- research funds are directed at bioprospecting, with few resources focused on developing the existing industry.

9.6 Potential future scenarios for the medicinal plant industry

There are a number of scenarios which could develop in the South African indigenous medicinal plant markets, depending on the relationship between a range of fixed and variable factors in the market. The fixed factors include:

- a large and growing local and international demand for medicinal plants,
- a declining supply of forest species in the short term,
- a fluctuating supply of grassland and savannah species in the short term,
- an increase in the price of scarce plants,
- diverse cultivation potential of indigenous medicinal plants,
- an increase in the number and diversity of market players,
- a negative policy environment in the short term, and
- majority of the current market players having limited business skills in the short term.

In contrast to the fixed factors, there are variable factors which will, to a large extent, determine how the market will change in the future. The key variable factors are driven by the actions of the different market players and the associated authorities. The variable actions of these key players include:

- degree to which the current market players cooperate to develop a common vision and to lobby for government support,
- responses of government departments (Health, Agriculture, Trade and Industry, and Environment and Tourism) to the indigenous medicine industry,
- responses of national, provincial, and local political leaders to the indigenous medicine industry,

- response of formal business to the opportunities in the industry, and
- quantities demanded for different levels of processing, certification, standards, and packaging.

The study identified three potential scenarios which could develop depending on the actions of key role players in the markets. The possible scenarios are as follows.

Scenario 1- No intervention - the continuation of the *status quo* - where there is limited investment in promoting the supply of popular plants to the current market players. Consequently, large commercial interests are likely to cultivate high value plants and trade processed products, while most of the current market players continue to compete for a decreasing share to a declining stock of popular plants. A narrow range of species would be cultivated, processed, and distributed for the upper end of the market with a small number of large business interests benefiting. Biodiversity and health care would be negatively impacted.

Scenario 2 - Industry driven intervention - collaboration between progressive current market players and skilled business interests - is likely to offer large benefits to large and intermediate companies and to a limited number of current market players. Cultivation, processing, and distribution would occur for the middle and upper end of the market. Small-scale traders and gatherers are likely to continue to trade in wild plants, but supply is likely to decline as the consumption of cheap products continues at the lower end of the market. Biodiversity and health care would be negatively impacted.

Scenario 3 - Collaborative intervention - collaboration between current market players, government and business interests - this could see the development of a wide range of processed products from simple rural products to sophisticated industrial products. Numerous market players could develop a range of different quality products for a wide range of consumers, with different prices suited the consumers' budgets. Such a scenario, is likely to promote the growth of the industry, and promote development at a broad scale. Investment in resource management is also more likely in this scenario. Health care would also benefit.

The most likely scenario to develop without market interventions is number 2, where big business enters the market and leads market development to suit its own objectives. Current investments by both government and big business are supporting the development of this scenario. Furthermore, current legislation supports the development of the corporate sector by excluding the less developed market players from producing more commercialized indigenous plant products. The costs of this scenario will be borne largely by the current consumers who will lose access to basic consumer goods through price increases and scarcity, and market players will lose access to trade products.

As the current consumers and current market players are largely from the least developed sector of South African society, it is essential to initiate market interventions which promote the welfare of the current consumers and market players, especially at the lower end of the market. At the same time, the opportunities for large-scale corporate involvement at the upper end of the market and in international markets, should be developed. To maximize the benefits to the greatest number of beneficiaries, South Africa needs to focus on achieving the development of both the existing market players and corporate entrants.

The development of the indigenous medicine market in South Africa will promote economic growth, people's development, consumer welfare, and biodiversity conservation. However, this will only be achieved if development takes place across the whole spectrum of the market, from rural resource management and production through to corporate bioprospecting and marketing.

The challenge facing the South African community is to capitalize on the market opportunities and to overcome the market constraints in the medicinal plant industry through achieving a greater balance in the distribution of development resources in public and private sector.

10. RECOMMENDATIONS

The market study has shown that the under-development of many aspects of the market has significant negative implications for consumer welfare, market players, state expenditure and biodiversity. The development of the market is therefore critical in promoting widespread welfare and in limiting the costs (direct and indirect) which society will bear as a result of continued market under-development.

Development requires actions at two key levels. Firstly, coordinated support for the indigenous medicine industry needs to be developed amongst policy-makers in all levels of government (and within a range of departments), in business and in NGOs. A supportive, consistent and positive policy and regulatory environment needs to be developed for the indigenous medicine industry. Secondly, development actions are required within the market itself. However, little significant market development will occur without a positive policy environment and a coherent strategy for industry transformation.

The actions required to develop the indigenous medicine markets are discussed below, largely in terms of the opportunities and constraints facing the market.

10.1 Recommendations for optimizing opportunities in market demand

Recommended actions regarding the growing demand for indigenous medicinal plants as a basic consumer good in South Africa, other African countries and abroad are:

- Decision-makers at all levels of government, business and civil society need to acknowledge the magnitude and permanence of indigenous medicine and the associated indigenous plant demand.
- Promote public awareness and open discussion regarding the demand and utilization of indigenous medicine.
- Investment in supply and market development should be undertaken given an assured market for indigenous medicine products.
- There should be long-term investment in the market.
- New opportunities should be investigated as demand grows.
- Export opportunities should be investigated and developed.
- Exploit consumer reverence for indigenous plants for promoting biodiversity conservation.

Recommended actions regarding consumer preference for better quality products and packaging, and for more modern dispensing locations and retail outlets are:

- Products, packaging and retail outlets and dispensing establishments should be developed to meet consumer demand and promote consumer welfare.
- Decision-makers in government and business should be made aware that consumers are not satisfied with the standards of products and market infrastructure.
- A focused information and technology transfer system should be developed to inform market players.

Recommended actions for optimizing the lack of accepted alternatives and the demand being relatively unresponsive to price changes are:

- There should be investment in product and market development in several sectors and for several species as demand for higher priced products exist.
- A range of different standard products with a range of prices should be marketed and response monitored to identify the levels of demand, and potential opportunities for expansion.

Recommended actions regarding the adaptability of indigenous medicine are:

- Identify development opportunities for South Africa from Indian and Chinese experiences in the development of indigenous medicine markets.
- Test the market for product acceptability, in collaboration with indigenous healers, traders and consumers.

10.2 Recommendations for optimizing opportunities in market supply

Recommended actions for management and utilization of existing wild plant stocks are:

- Populations of scarce plants should be identified, and genetic material preserved appropriately using resource protection, and the establishment of gene banks conserving the diversity in genetic material from various localities.
- A programme for promoting the farming of medicinal plants in commercial and communal rangelands and forests should be developed, and should include:
    - information dissemination regarding values and opportunities,
    - demonstration of management and harvesting techniques in different habitats,
    - provision of ongoing technical expertise to farmers in management, harvesting and marketing of wild plants through an extensive extension programme,
    - provision of source materials, including seeds and cuttings, for enrichment planting,
    - the development of economic models for estimating returns on wild plant farming.
- The traders' demand for bark products should be coordinated with logging operations in indigenous forests.
- The process of authorizing land use changes such as afforestation, water impoundment and other land clearing activities should incorporate mandatory plant salvage operations.
- Research into the sustainable harvesting of wild plants at both the population and individual plant level should be undertaken.

Recommended actions for the optimal use of existing expertise in plant cultivation, processing and marketing are:

- Establish a directory of individuals with appropriate expertise and services.
- Develop a networking system between potential suppliers of expertise and services, and the market players requiring expertise. A funding system would need to be established to facilitate the transfer of expertise to poorly resourced market players.
- Identify and access appropriate international expertise and case studies with potential for contributing to the southern African situation. Develop and publish guidelines for cultivation, processing and marketing from the lessons learnt in other countries.
- Build on the expertise of current market players, particularly the plant harvesters, who can use their existing expertise to promote more efficient supply and marketing. Training programmes with appropriate curricula would need to be established in various accessible centres.
- Build on the expertise of institutions which have already developed extensive knowledge in production, cultivation, processing and marketing.

Recommended actions for optimizing the demand for new agricultural opportunities are:

- Make market information, agronomic schedules and production costs available to farmers via various media and through training extension workers in agricultural departments.
- Reform obstructive legislation which prevents the commercial production of medicinal plants.
- Provide short courses in the propagation, cultivation, and marketing of medicinal plants for a range of farming skills and literacy levels.

Recommended action for optimizing the existing market information systems is:

- Develop a marketing information system appropriate to existing trade networks and appropriate to market participants' skills.

10.3 Recommendations for minimizing constraints in market supply

Recommended actions for addressing the negative policy environment and obstructive regulatory mechanisms which impact on the supply of plants are:

- Inform policy-makers of the negative impact of current policies and regulations on consumer welfare, industry sustainability, economic development and biodiversity.
- Inform policy-makers of both the cost savings and potential opportunities which the medicinal plant trade creates.
- Inform market players of the need to lobby for policy change and reform of regulations concerning the trade in medicinal plants.
- Inform decision-makers of the potential human and economic development opportunities associated with the indigenous medicine trade.
- Use international case studies as examples for South African policy-makers.
- Develop support for policy reform in leading political figures. There needs to be a champion for the reform of government policies in the trade of plants and plant products.
- Establish a medicinal plant strategy unit for southern Africa to develop coordinated policies between states and to generate information for informing policy at a national and international level.

Recommended actions for addressing institutional constraints regarding market supply are:

- Identify sources of funding from outside of government departments to reduce conflicts over already limited government resources.
- NGOs, government departments and market players should collaborate and develop partnerships with international funding agencies to obtain resources for new initiatives.
- Develop an advocacy programme for showing the benefits of developing the medicinal plant trade to government officials in local, regional, and national governments. This action would be closely associated with the medicinal plant strategy unit recommended above.
- Establish a team of collaborators in government departments who should be stakeholders but who may not have the resources to lead any projects.

Recommended actions for limiting the disunity in the markets due to competition are:

- Inform market players of the potential benefits of greater market unity by using international examples.
- Organizational development should be promoted within various sectors in the industry.
- Promote the lobbying ability of market players through training courses.
- Promote the development of a cross-sectoral organization which could represent the interests of all market players.
- Promote a focus on personal business development to promote widespread support from all market players.

Recommended actions for promoting business skills within the medicinal plant market are:

- Basic literacy courses should be provided for gatherers and street traders.
- Courses in business skills should be developed for a range of enterprises.
- Courses on beneficiation at various stages in the marketing process should be developed and provided to market players, especially at gatherer and trader levels.

Recommended action for promoting more efficient marketing is:

- Development and implementation of a market information system which should include [Koppell 1995]:
    - selecting locations for market information systems,
    - identification of participants in market information systems,
    - gathering information required to design a market information system,
    - design a market information system, and
    - implement a market information system.

Recommended actions for promoting the quantity of plants supplied to markets are:

- Programmes for the management of wild plants and the cultivation of plants are required at a range of scales to supply urban, rural and international consumers, and for supplying commercial processing of phytomedicines.
- Investment in cultivation must be made to reduce the reliance on wild plant stocks for the medicinal plant industry.
- The most popular species are an immediate priority that should be focused on, and include the nine species which are a focus of the market survey.
- Forest species are a higher priority than other species, and cultivation should be priority due to the small areas of forest remaining in South Africa.
- Slow-growing forest species which are unlikely to be cultivated by commercial enterprises will need to be the focus of government and NGO activities.
- Grassland, savannah and thicket species should be the focus of management as relatively large stocks still remain on commercial farmland.
- Research needs to quantify and identify sustainable harvesting strategies for the wild plant stocks on commercial farms.

Recommended actions for promoting the quality of plants supplied to markets are:

- Research should identify genotypes with high potential for commercial purposes, and then conduct trials for the selection of high yielding varieties.
- High yielding variations within species need to be propagated and disseminated to farmers.
- Research should take place into the development of efficient packaging and storage of plant medicines.
- Promote the development of hygienic and convenient market places for consumers and traders.

Recommended action for research on the medicinal plant markets is:

- There should be a reorientation of research investment regarding medicinal plants, with a shift from pharmacological studies to research which identifies effective methods of sustaining market supply and improving the quality of products currently consumed.

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APPENDIX 1 :

Questionnaires used in the survey

1a: Street Traders and Gatherers Questionnaire

1b: Traditional Healer Questionnaire

1c: Traditional Healer's Customer and Clinic Patients Questionnaire

1d: Retailer Questionnaire

Appendix 1a: STREET TRADERS and GATHERERS QUESTIONNAIRE

A. POPULARITY

Growing medicinal plants for the market requires that a grower have some understanding of the demand for plants. A farmer will produce plants that he or she knows will be easy to sell. We need to find out how large the demand is for certain medicinal plants. If you think that there are other plants that are important as they are becoming scarce, then add them to this list.

1 Which medicinal plants have you sold the most of in the last year? This is the number of times that the plant has been sold. (Tick only).

Name of medicinal plant	High sales	Moderate sales	Low sales
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

2 Have the sales of these medicinal plants changed or not in the last five years?

Name of medicinal plant	Increased	Decreased	The same
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

3 Please give reasons why you think there have been changes.

4 Which times of the year do people ask for these medicinal plants the most?

Name	Spring	Summer	Autumn	Winter
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

5 Why would you say the medicinal plants are sold in certain seasons?

Name	When plant can be found	Time when illness is common	Harvesting ritual	Other reasons
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

B. USAGE

A farmer must have some idea how many plants he or she can sell to the market every year. We therefore need to get some indication of how many medicinal plants were sold in the market in the last year.

6 What unit of measure do you use for selling the medicinal plants?

Name	Unit (cup, handful, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

7 How often do you sell these medicinal plants in a month?

Name	Number of times a month
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

8 How long can you keep the medicinal plants before they loose their healing properties?

Name	Shelf life (months, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

9 Where do you buy or collect these medicinal plants? (The name of the place)

Name	Buy	Collect	Place
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

10 How often do you collect or buy these plants per month?

Name	Buy/collect per month (sack, checkers)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

11 What costs other than buying plants have you had to pay in order to market your plants?

Costs	Amount per day/week
Travel	
Rent	
Assistance	
Security	

12 Which medicinal plants are regularly requested by the same customers? Do some customers regularly ask for the same plants?

Name	Regular Customers	Customers not regular
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

13 Where do most of your customers come from?
1. Within town
2. From other provinces
3. From out of town
4. Do not know

14 Are your customers concerned about price?
1. Do they bargain with you
2. Do they accept your prices
3. Do they leave if your prices are too high for them

15 Would you say customers are concerned about quality?
1. Not concerned
2. Do not know
3. Very concerned

16 Are your customers (tick the appropriate block) :

Male	[ ]	female	[ ]
Well dressed	[ ]	poorly dressed	[ ]
Literate	[ ]	illiterate	[ ]
Speak English	[ ]	don't speak English	[ ]
Poor	[ ]	wealthy	[ ]

17 How do you package the medicinal plants you sell?

_____

_____

18 How many sacks or checkers do you sell a week? If it is not know, then ask how much is transported to the market every week?
Sacks [ ]
Checkers [ ]

19 Do you throw medicinal plants away?
1. No
2. Yes How many checkers per week [ ]

20 Do you know other places to sell medicinal plants?
1. Yes
2. No

21 What do you do to ensure that there are plants for you to harvest in the future?

_____

_____

_____

C. PRICES AND SEASONAL VARIATIONS

If medicinal plants are going to be grown for the market, then farmers need to have some understanding of their prices and variations that can be expected in the market. To determine whether growing these plants will be profitable or not, we need to compare the costs of producing the plants and the prices that may be received in various places within the market. For example, a farmer would need to know what prices could be expected at different times of the year, in different regions, and from different buyers.

22 What are your selling prices for the medicinal plants listed below?

Name	Unit	Price
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

23 Can you recall how the number of plants have changed in recent years? How much did time did you take to collect a sack of medicinal plants in 1985, 1990, and in 1995? (Remember to quote the time for the same size sack.)

Name	Unit	Time in 1995	Time in 1990	Time in 1985
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

24 Are you having to move to new areas to collect your medicinal plants? Please fill in the place names.

Name	Same areas	Use new areas
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

D. INFORMATION ON CULTIVATION OF MEDICINAL PLANTS

An important factor in the marketing of medicinal plants are the attitudes which users will have towards cultivated plants. We need to understand how traders, traditional healers and other users feel about cultivated plants to assess the potential for cultivating these plants.

25 If these medicinal plants were grown by local farmers, would you buy them or not?

Name	Buy them	Not buy them
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

26 If you answered 'not buy them' to any of the plants above, please explain why?

27 How would you recognise a cultivated medicinal plant compared to a plant that has been harvested from the bush?

28 If these medicinal plants could be farmed, would you grow them or not?

Name	Grow them	Not grow them
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

29 What do you think are the most important reasons reducing the availability of medicinal plants?

30 What do you think are the most important reasons for growing or not growing medicinal plants?

31 What would you do if certain wild plants can no longer be found in the bush?

32 Why do you sell here? Choose the most important reason.

1. There are lots of people passing through
2. The prices people pay are higher here
3. It is easy for me to travel to here
4. I know the other traders here
5. Nobody bothers me when I trade here
6. Other reason

33 What would help you run your business better?
1. More information on how to run a business
2. An organisation to help you improve your business
3. Easier access to credit to help you run your business

34 For improving your well being as a street trader, rank the following resources (1 being the most important - 2 less important and so on).
Building for storage [ ]
Building for selling [ ]
Accommodation [ ]
A traders organisation [ ]
Other reason [ ]

35 Which of the age categories do you belong to?
1. 15-25 2. 26-35
3. 36-45 4. 46-55
5. 56-65 6. 66+

36 What is the traders :
Age [ ]
Gender [ ]

37 What amount of money best describes your income per week from trading in medicinal plants?
1. Less than R50 per week
2. R50 per week
3. R100 per week
4. R150 per week
5. R200 per week
6. R250 per week
7. R300 per week
8. R400 per week
9. R500 per week
10. More than R500 per week

38 How many people help you trade here on the street?

39 How many people gather plants for you to sell here?

40 What educational levels have you got?
1. No schooling
2. Attended junior school
3. Completed standard 8
4. Completed standard 10
5. Completed a diploma or degree

41 Where is your home?

42 Where do you stay if you do not go home at night?

Appendix 1b: TRADITIONAL HEALER QUESTIONNAIRE

A. POPULARITY

Producing medicinal plants for the market requires that a grower have some understanding of the demand for plants. A farmer will produce plants that he or she knows will be easy to sell. We need to find out how large the demand is for certain medicinal plants. If you think that there are other plants that are important as they are becoming scarce, then add them to this list.

1 Which medicinal plants have you sold the most of in the last year? This is the number of times that the plant has been sold. (Tick only).

Name of medicinal plant	High sales	Moderate sales	Low sales
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

2 Have the sales of these medicinal plants changed or not in the last five years?

Name of medicinal plant	Increased	Decreased	The same
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

3 Please give reasons why you think there have been changes.

4 Do you think the demand for these medicinal plants will be high or low in future?
1. Demand will remain high
2. Demand will remain the same
3. Demand will decrease
4. I cannot tell

5 Give reasons for your answer?

6 Which times of the year are these medicinal plants in the greatest demand?

Name	Spring	Summer	Autumn	Winter
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

7 Why would you say the medicinal plants are demanded in certain seasons?

Name	When plant can be found	Time when illness is common	Harvesting ritual	Other reasons
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

8 What level of medicinal plants would you like to stock?

Name	Higher stock level	Medium stock level	Lower stock level
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			

Umathithibala			

9 What determines the level of stock that is desired?

Name	Reason (cost, demand, irregular supply, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

B. SUBSTITUTABILITY

Before growing medicinal plants for traditional healing purposes, it is important to know whether the plants can be easily substituted with other plants. For example, if unukani can be substituted with undlangwenya or umkhondweni, then it may not be worthwhile to grow unukani. We therefore need to understand the substitutability of the plants.

10 Do these medicinal plants have any substitutes? Please give name of substitute/s if the answer is yes.

Name	Yes	No	Name of substitute/s
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

11 What is causing substitution to take place?

12 Do you accept the substitutes as being effective?

Name	Readily Acceptable	Acceptable	Not Acceptable
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

13 Is the use of plants changing over time?

Name	New uses / treatments	New plant part used	Smaller size used
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

C. USAGE

A farmer must have some idea how many plants he or she can sell to the market every year. We therefore need to get some indication of how many medicinal plants were sold in the market in the last year.

14 What unit of measure do you use for selling the medicinal plants?

Name	Unit (cup, handful, etc)	Weight	Size (thickness of bark or bulb)
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

15 How often do you sell these medicinal plants in a month?

Name	Number of times a month
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

16 How long can you keep the medicinal plants before they loose their healing properties?

Name	Shelf life (months, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

17 Who do you buy these medicinal plants from (gatherers, street sellers, muthi shops etc)? Where do you buy these medicinal plants (the name of the place) and how often do you buy per month?

Name	Seller	Place	Per month
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

18 How do you package the medicine you sell?

_____

_____

19 Where do most of your customers come from?
1. Within town
2. From other provinces
3. From out of town
4. Do not know

20 Do your customers ask for the medicinal plants by name or do they describe their problem and ask you to prescribe the appropriate medicine?
1. Customers ask for a specific medicine by name
2. Problem is described and prescription given

21 Why do customers come to your shop instead of visiting clinics? Indicate your level of agreement/disagreement to the following reasons why your customers might visit your shop instead of a clinic.

	Strongly Disagree	Disagree	Do not know	Agree	Strongly Agree
1. Customers want a traditional medicine	[ ]	[ ]	[ ]	[ ]	[ ]
2. Customers could not be cured at the clinics	[ ]	[ ]	[ ]	[ ]	[ ]
3. There are no clinics close to where the customers live	[ ]	[ ]	[ ]	[ ]	[ ]
4. Other medicines are too expensive	[ ]	[ ]	[ ]	[ ]	[ ]
5. Other reason	[ ]	[ ]	[ ]	[ ]	[ ]

22 Do you think your customers are comfortable coming to a traditional healer?
1. They are uncomfortable
2. They appear comfortable
3. I do not know

23 How readily do your customers accept price?
1. They bargain with you
2. They accept your prices
3. They leave if your prices are too high for them

24 If the medicinal plants the customers are looking for is not available, would you say customers would :
1. Settle for an alternative
2. Leave the shop and look elsewhere
3. Not sure

25 Would you say customers are concerned about quality?
1. Not concerned
2. Do not know
3. Very concerned

26 Are your customers (tick the appropriate block) :

Male	[ ]	female	[ ]
Well dressed	[ ]	poorly dressed	[ ]
Literate	[ ]	illiterate	[ ]
Speak English	[ ]	don't speak English	[ ]
Poor	[ ]	wealthy	[ ]

27 How would customers react if traditional medicines were sold in modern packaging?
1. They would buy less
2. They would buy more
3. They would not change their use

D. PRICES AND SEASONAL VARIATIONS

If medicinal plants are going to be grown for the market, then farmers need to have some understanding of their prices and variations that can be expected in the market. To determine whether growing these plants will be profitable or not, we need to compare the costs of producing the plants and the prices that may be received in various places within the market. For example, a farmer would need to know what prices could be expected at different times of the year, in different regions, and from different buyers.

---

28 What are the selling prices for the medicinal plants listed below?

Name	Unit	Price
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

29 Kindly recall how prices have changed in recent years. How much did you buy the various medicinal plants for in 1985, 1990, and in 1995? (Remember to quote prices for the same unit sizes.)

Name	Unit	Price in 1995	Price in 1990	Price in 1985
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

30 Have the prices of the substitute medicinal plants also changed or not over the years?
1. Prices have changed just like the original medicinal plants
2. Prices for substitutes have not changed at all
3. Other

31 Are there any price variations in the different areas you buy your medicinal plants from?
1. Prices differ depending on where you buy from
2. The prices tend to be the same in different areas
3. I do not know

32 Indicate whether or not there are differences in the prices of the medicinal plants during different times of the year.

Name	Large seasonal variations in prices	Small price variations	No price variations
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

33 What reasons would you give for the price variations?

E. INFORMATION ON CULTIVATION OF MEDICINAL PLANTS

An important factor in the marketing of medicinal plants are the attitudes which users will have towards cultivated plants. We need to understand how traders, traditional healers and other users feel about cultivated plants to assess the potential for cultivating these plants.

34 If these medicinal plants had to be cultivated, would you accept them or not?

Name	Accept them	Not accept them
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

35 If you answered 'not acceptable' to any of the plants above, please explain why?

36 How would you recognise a cultivated medicinal plant compared to a plant that has been harvested from the bush?

37 What would you use if certain wild plants are no longer available?

38 Would you be interested in buying cultivated plants from the growers?
1. Yes 2. No 3. I do not know

F. GENERAL QUESTIONS

39 Which of the age categories do you belong to?
1. 15-25 2. 26-35
3. 36-45 4. 46-55
5. 56-65 6. 66+

40 Gender
1. Male 2. Female

41 (It is not necessary to answer this question)
Which category best describes your monthly income?
1. <R200 2. R200-R500
3. R500-R1000 4. R1000-R2000
5. R2000-R3000 6. >R3000

42 What support would you

1
2
3
4
5

43 How many patients do you treat per day?

44 What is the average cost of a treatment per patient?

R

45 How many people work at your practice?

46 How many people gather plants for you?

47 How many sacks of muthi do you buy per month?

48 How do you package muthi?
1. newspaper 2. plastic/checkers
3. bottle 4. other (specify)

49 When buying plants, would you prefer :
1. hygienically packaged [ ]
2. as they are [ ]

50 Would you be prepared to buy bark that has been already ground if people had been trained to do it properly?
1. Yes [ ]
2. No [ ]

Appendix 1c: TRADITIONAL HEALER'S CUSTOMER and CLINIC PATIENT QUESTIONNAIRE

A. DEMOGRAPHICS

We need to ask you some questions about yourself to help us understand why you use traditional medicines.

1 How many people are there in your household?
Children [ ]
Adults [ ]

2 Which of the following age categories do you belong to?
1. 15-25
2. 26-35
3. 36-45
4. 46-55
5. 56-65
6. 66+

3 Gender
1. Male
2. Female

4 Marital status
1. Married
2. Single
3. Single parent

5 What religion (denomination) do you belong to?

6 How many people are in your household?
1. 1-3
2. 4-5
3. 6-8
4. 9+

7 What type of home do you stay in?
1. 4 rooms in township
2. Flat
3. Big house
4. Hostel
5. Shack
6. Traditional homestead
7. Rented room

8 What is the education levels you obtained?
1. No schooling
2. Completed standard 5
3. Completed standard 8
4. Completed standard 10
5. Completed a diploma or degree

9 How many adults in the household have got work?
Got work [ ]
Unemployed [ ]

10 What is your occupation?
1. Unemployed
2. Self employed
3. Employed part time
4. Employed full-time

11 What job do you have?

12 What is the occupation of the head of the household?

13 Kindly indicate the range your monthly income is in. What amount of money best describes your households income per month? (All the money which all your family members may earn.)
1. Less than R400 per month
2. Between R400 and R800 per month
3. Between R800 and R1 500 per month
4. Between R1 500 and R2 500 per month
5. Greater than R2 500 per month

B. ATTITUDE AND BEHAVIOUR

Because many medicinal plants take a long time to grow, farmers need to know how much medicine people will want to use each year. We need to ask you some questions about your use of traditional medicines to understand how much medicine may be needed now and in the future.

14 How many times did you visit a traditional healer last year?
1. None
2. Once
3. Two to three times
4. Four to six times
5. More than six times

15 Did other members of your family also visit a traditional healer last year?
1. Yes
2. No

16 Think back to 1990. Have the number of times that you visit a traditional healer changed in the last few years?
1. I now go more often
2. I now go less often
3. I now go the same as before

17 If you have changed your use, why?

18 Why do you visit a traditional healer? Indicate your level of agreement/ disagreement to the following reasons of why you might visit a traditional healer.

	Strongly Disagree	Disagree	Do not Know	Agree	Strongly Agree
1. I want a traditional medicine	[ ]	[ ]	[ ]	[ ]	[ ]
2. I could not be cured at the clinics	[ ]	[ ]	[ ]	[ ]	[ ]
3. There are no clinics close to where I live	[ ]	[ ]	[ ]	[ ]	[ ]
4. Other medicines are too expensive	[ ]	[ ]	[ ]	[ ]	[ ]
5. Other reason	[ ]	[ ]	[ ]	[ ]	[ ]

19 How do you travel to the traditional healer?
1. Walk
2. Taxi
3. Bus
4. Train
5. Other

20 If you walk, how long does it take you?
1. Less than 10 minutes
2. 10 to 20 minutes
3. More than 20 minutes

21 If you catch a taxi, train or bus how much does it cost you (return fare)?
[R]

22 Is it only to see the traditional healer
1. Yes
2. No

23 How many times did you visit a clinic or doctor last year? (not a traditional healer)
1. None
2. Once
3. Two to three times
4. Four to six times
5. More than six times

24 Do you walk to the clinic?
1. Yes
2. No

25 If so, how long does it take you?
1. Less than 10 minutes
2. 10 to 20 minutes
3. More than 20 minutes

26 Do you take a taxi, train or bus to the clinic or doctor?
1. Yes
2. No

27 If so, how much does it cost (return fare)?
[R]

28 If you could get treated at a clinic, is it more expensive or cheaper than a traditional healer?
1. Cheaper
2. Same
3. More expensive

29 If you had the choice between going to a clinic and going to a traditional healer, what would you choose? (Your first choice, forgetting about the cost.)
1. Go to a traditional healer
2. Go to a clinic
3. It depends on what treatment I need
4. Do not know

30 Do you think that you will use more or less traditional medicines in the future?
1. More
2. Less
3. The same
4. Do not know

31 If a clinic was closer to your house, would you use traditional medicines more or less often?
1. Less
2. More
3. The same as before
4. It depends on what treatment I need

32 If traditional medicines were more expensive, would you use them less often?
1. Use them less
2. Use them the same as before

C. PREFERENCE FOR MEDICINES

33 If traditional medicines were cultivated would you continue using them?
1. I would continue using them
2. I would stop using them
3. Not sure

34 If answer to above question is (2), please give a reason why.

---

35 Would you prefer traditional medicines to be packaged in a more hygienic and modern way?

1. Yes
2. No
3. I do not know

36 Would you prefer traditional medicines to be certified by a healers association?

1. Yes
2. No
3. I do not know

37 Would you prefer to see the place where you buy medicines made more modern?

1. Yes
2. No
3. I do not know

Appendix 1d: RETAILER QUESTIONNAIRE

A. POPULARITY

Producing medicinal plants for the market requires that a grower have some understanding of the demand for plants. A farmer will produce plants that he or she knows will be easy to sell. We need to find out how large the demand is for certain medicinal plants. If you think that there are other plants that are important as they are becoming scarce, then add them to this list.

1 Which medicinal plants have you sold the most of in the last year? This is the number of times that the plant has been sold.

Name of medicinal plant	High sales	Moderate sales	Low sales
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

2 Have the sales of these medicinal plants changed or not in the last five years?

Name of medicinal plant	Increased	Decreased	The same
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

3 Please give reasons why you think there have been changes.

4 Do you think the demand for these medicinal plants will be high or low in future?
1. Demand will remain high
2. Demand will remain the same
3. Demand will decrease
4. I cannot tell

5 Give reasons for your answer?

6 Which times of the year are these medicinal plants in the greatest demand?

Name	Spring	Summer	Autumn	Winter
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

7 Why would you say the medicinal plants are demanded in certain seasons?

Name	When plant can be found	Time when illness is common	Harvesting ritual	Other reasons
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

8 Which medicinal plants would you say were most frequently requested by the clients?

Name	Requested most frequently	Requested moderately	Not frequently requested
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

9 What level of medicinal plants would you like to stock?

Name	Higher stock level	Medium stock level	Lower stock level
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

10 What determines the level of stock that is desired?

Name	Reason (cost, demand, irregular supply, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

B. SUBSTITUTABILITY

Before growing medicinal plants for traditional healing purposes, it is important to know whether the plants can be easily substituted with other plants. For example, if unukani can be substituted with undlangwenya or umkhondweni, then it may not be worthwhile to grow unukani. We therefore need to understand the substitutability of the plants.

11 Do these medicinal plants have any substitutes? Please give name of substitute/s if the answer is yes.

Name	Yes	No	Name of substitute/s
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

12 What is causing substitution to take place?

13 Do you accept the substitutes as being effective?

Name	Readily Acceptable	Acceptable	Not Acceptable
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

14 Is the use of plants changing over time?

Name	New uses	New part used	Smaller size used
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

C. USAGE

When growing any crops for the market it is important to know how many plants to produce for the market. The farmer must have some idea how many plants he or she can sell to the market every year. We therefore need to get some indication of how many medicinal plants were sold in the market in the last year.

15 What unit of measure do you use for selling the medicinal plants?

Name	Unit (cup, handful, etc)	Weight	Size (thickness of bark or bulb)
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

16 How often do you sell these medicinal plants in a month?

Name	Number of times a month
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

17 How long can you keep the medicinal plants before they loose their healing properties?

Name	Shelf life (months, etc)
Isibhaha	
Indungulo, Isiphephetho	
Igibisila	
Umathunga	
Unukani	
Ikhathazo	
Umlahleni	
Inguduza	
Umathithibala	

18 What quantity of these medicinal plants did you sell this last year?

Name	Unit	Weight	Quantity
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

19 How do you package the medicine you sell?

_____

D. SOURCES OF SUPPLY AND CUSTOMERS

Understanding the supply network is important for potential plant growers. A farmer needs to know where they will be able to sell their crop, how far it will be to the market and how long it will take them to sell the produce. In addition, it is important for the growers to know how the customers are going to react in the future. Most medicinal plants take at least a few years before they can be harvested, and therefore farmers need to know whether or not the crop they put in the ground this year will have a market in a few years time.

20 Who do you buy these medicinal plants from (gatherers, street sellers, muthi shops, traditional healers, etc)? Where do you buy these medicinal plants (the name of the place) and how often do you buy them per month?

Name	Seller	Place	Per Month
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

21 Which of the following customers do you sell most often to? Rank them.
Patients looking for a treatment [ ]
Street sellers [ ]
Traditional healers [ ]
Other specify [ ]

22 Where do most of your customers come from?
1. Within town
2. From other provinces
3. From out of town
4. Do not know

23 Do your customers ask for the medicinal plants by name or do they describe their problem and ask you to prescribe the appropriate medicine?
1. Customers ask for a specific medicine by name
2. Problem is described and prescription given

24 Why do customers come to your shop instead of visiting clinics? Indicate your level of agreement/disagreement to the following reasons why your customers might visit your shop instead of a clinic.

	Strongly Disagree	Disagree	Do not know	Agree	Strongly Agree
1. Customers want a traditional medicine	[ ]	[ ]	[ ]	[ ]	[ ]
2. Customers could not be cured at the clinics	[ ]	[ ]	[ ]	[ ]	[ ]
3. There are no clinics close to where the customers live	[ ]	[ ]	[ ]	[ ]	[ ]
4. Other medicines are too expensive	[ ]	[ ]	[ ]	[ ]	[ ]
5. Other reason	[ ]	[ ]	[ ]	[ ]	[ ]

25 Do you think your customers are comfortable coming to a Muthi shop?
1. They are uncomfortable
2. They appear comfortable
3. I do not know

26 Are customers concerned about price?
1. Do they bargain with you
2. Do they accept your prices
3. Do they leave if your prices are too high for them

27 If the medicinal plants the customers are looking for is not available, do they
1. Settle for an alternative
2. Leave the shop and look elsewhere
3. Not sure

28 Would you say your customers are concerned about quality?
1. Not concerned
2. Do not know
3. Very concerned

29 Are your customers (tick the appropriate block) :

Male	[ ]	female	[ ]
Well dressed	[ ]	poorly dressed	[ ]
Literate	[ ]	illiterate	[ ]
Speak English	[ ]	don't speak English	[ ]
Poor	[ ]	wealthy	[ ]

30 How would customers react if traditional medicines were sold in modern packaging?
1. They would buy less
2. They would buy more
3. They would not change their use

E. PRICES AND SEASONAL VARIATIONS

If medicinal plants are going to be grown for the market, then farmers need to have some understanding of their prices and variations that can be expected in the market. For example, a farmer would need to know what prices could be expected at different times of the year, in different regions, and from different buyers.

---

31 What are the selling prices for the medicinal plants listed below?

Name	Unit	Price
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

32 Kindly recall how prices have changed in recent years. How much did you buy the various medicinal plants for in 1985, 1990, and in 1995? (Remember to quote prices for the same unit sizes.)

Name	Unit	Price in 1995	Price in 1990	Price in 1985
Isibhaha				
Indungulo, Isiphephetho				
Igibisila				
Umathunga				
Unukani				
Ikhathazo				
Umlahleni				
Inguduza				
Umathithibala				

33 Have the prices of the substitute medicinal plants also changed or not over the years?
1. Prices have changed just like the original medicinal plants
2. Prices for substitutes have not changed at all
3. Other

34 Are there any price variations in the different areas you buy your medicinal plants from?
1. Prices differ depending on where you buy from
2. The prices tend to be the same in different areas
3. I do not know

35 Indicate whether or not there are differences in the prices of the medicinal plants during different times of the year.

Name	Large seasonal variations in prices	Small price variations	No price variations
Isibhaha			
Indungulo, Isiphephetho			
Igibisila			
Umathunga			
Unukani			
Ikhathazo			
Umlahleni			
Inguduza			
Umathithibala			

36 What reasons would you give for the price variations?

F. INFORMATION ON CULTIVATION OF MEDICINAL PLANTS

An important factor in the marketing of medicinal plants are the attitudes which users will have towards cultivated plants. We need to understand how traders, traditional healers and other users feel about cultivated plants to assess the potential for cultivating these plants.

37 If these medicinal plants had to be cultivated, would you accept them or not?

Name	Accept them	Not accept them
Isibhaha		
Indungulo, Isiphephetho		
Igibisila		
Umathunga		
Unukani		
Ikhathazo		
Umlahleni		
Inguduza		
Umathithibala		

38 If you answered `not acceptable' to any of the plants above, please explain why?

39 What would you use if certain wild plants are no longer available?

40 Would you be interested in buying cultivated plants from the growers?
1. Yes
2. No
3. I do not know

G. GENERAL QUESTIONS

41 Which of the age categories do you belong to?
1. 15-25
2. 26-35
3. 36-45
4. 46-55
5. 56-65
6. 66+

42 Gender
1. Male
2. Female

43 What support would you like to get in order to improve your business? (e.g. formal business training, credit, regular plants supply etc.) In order of priority :

1)	
2)	
3)	
4)	
5)	

44 How many patients do you treat per day? [ ]

45 What is the average cost of a treatment per patient? [ ]

46 How many people work at your practice/shop? [ ]

47 How many people gather plants for you? [ ]

48 How many sacks of muthi do you buy per month? [ ]

APPENDIX 2:

Model for estimating mass and number of times indigenous medicine is used in Durban

Appendix 2: MODEL FOR ESTIMATING MASS AND NUMBER OF TIMES INDIGENOUS MEDICINE IS USED IN DURBAN

Scenario 1 : Estimates based on healers and street traded quantities						
53% of black population consuming 83.3g per healers consultation						
Number of times used	**% of sample**	**Number of users**	**Total users**	**Number of times used**	**Average mass of prescribed medicine**	**Total tonnes**
2.5	0.37	1 294 260	478 876	1 197 191	83.3	100
1	0.32	1 294 260	414 163	414 163	83.3	34
8	0.18	1 294 260	232 967	1 863 734	83.3	155
5	0.13	1 294 260	168 254	841 269	83.3	70
Total number			**1 294 260**	**4 316 357**		**360**
31% of black population consuming 216.5g per street purchase						
Number of times used	**% of sample**	**Number of users**	**Total users**	**Number of times used**	**Average mass of purchased medicine**	**Total tonnes**
2.5	0.37	757 020	280 097	700 244	216.5	152
1	0.32	757 020	242 246	242 246	216.5	52
8	0.18	757 020	136 264	1 090 109	216.5	236
5	0.13	757 020	98 413	492 063	216.5	107
Total number			**757 020**	**2 524 622**		**547**
Total for healers and street trade			**2 051 280**	**6 841 019**		**906**
Average frequency of use - weighted by % of sample				**3.34**		
Scenario 2 : Estimates based on street traded quantities assuming wastage at healers and shops						
84% of black population using 216.5g per consultation/purchase						
Number of times used	**% of sample**	**Number of users**	**Total users**	**Number of times used**	**Average mass of prescribed medicine**	**Total tonnes**
2.5	0.37	2 051 280	758 974	1 897 434	216.5	411
1	0.32	2 051 280	656 410	656 410	216.5	142
8	0.18	2 051 280	369 230	2 953 843	216.5	640
5	0.13	2 051 280	266 666	1 333 332	216.5	289
Total for street traders			**2 051 280**	**6 841 019**		**1 481**

APPENDIX 3:

Protected and Specially Protected Indigenous Species

Appendix 3: PROTECTED AND SPECIALLY PROTECTED INDIGENOUS SPECIES

PROTECTED INDIGENOUS PLANTS

SCIENTIFIC NAME	ENGLISH NAME
Alberta magna	Natal Flame Bush
Albizia suluensis	Zulu False-thorn
All *Amaryllidaceae*	All members of the amaryllis family. This includes the genera Haemanthus, Scadoxus, Boophane, Clivia, Nerine, Brunsvigia, Crinum, Ammocharis, Cyrtanthus
Aloe saundersiae	Grass aloes
Aloe microcantha	
Aloe cooperi	
Aloe aristata	
Aloe dominella	
Aloe minima	
Aloe modesta	
Aloe inconspicua	
Aloe kniphofioides	
Aloe myricantha	
Aloe thraskii	Dune Aloe
Aloe barberiae	Tree Aloe
Atalaya natalensis	Natal Krantz Ash
Avicennia marina	White Mangrove
Barringtonia racemosa	Brackwater Mangrove, Power-puff Tree
Baphia racemosa	Natal Camwood
All *Bersama*	the White Ash trees
Bowkeria citrina	Yellow Shell-flower Bush
All *Brachystelma*	Brachystelmas
Breonadia salicina	Matumi
Bruguiera gymnorrhiza	Black Mangrove
All *Cassipourea*	Onionwood trees
All *Ceropegia*	Ceropegias
All *Catha*	
All *Cyathea*	Tree ferns
Curtisia dentata	Assegaai
All *Drosera*	Sundews
All *Encephalartos* *including hybrids and excluding those listed as Specially Protected*	Cycads and their hybrids
All *Erica*	Ericas
Euphorbia bupleurifolia	Herbaceous succulent euphorbias
Euphorbia franksiae	
Euphorbia woodii	
All *Eugenia*	Myrtles
Ficus bizanae	Pondo Fig
Ficus trichopoda	Swamp Fig, Hippo Fig

SCIENTIFIC NAME	ENGLISH NAME
All *Gasteria*	Gasterias
Gerbera aurantiaca	Hilton Daisy
All *Gladiolus*	Gladiolii
All *Haworthia*	Haworthias
Hibiscus tiliaceus	Lagoon Hibiscus
All *Huernia*	Succulent Asclepiads
All *Hyacinthaceae*	Lilies. Includes the genera Eucomis, Scilla, Bowiea, Albuca, Thuranthos, Urginea, Galtonia, Drimia, Dipcadi, Ornithogalum, Drimiopsis
Hydrostachys polymorpha	Waterfall flower
Impatiens flanaganiae	
All *Kniphofia*	Red Hot Pokers
All *Lauraceae*	Wild Quince and Stinkwood trees
Lumnitzera racemosa	Tonga Mangrove
Mimusops caffra	Coastal Red Milkwood
Millettia sutherlandii	Giant Umzimbeet
Millettia grandis	Umzimbeet
Newtonia hildebrandtii	Lebombo Wattle
All *Orchidaceae*	Orchids
Oxyanthus pyriformis	Natal Loquat
All *Podocarpus*	Yellowwood trees
All *Proteaceae*	Proteas, Faureas, Leucospermums, and Leucodendrons
Prionium serratum	Palmiet
Prunus africana	Red Stinkwood
Pseudosalacia streyi	Rock Lemon
Raphia australis	Raphia Palm
Raspalia trigyna	Raspalia
Rhizophora mucronata	Red Mangrove
Rhynchocalyx lawsonioides	Natal Privet
All *Salicornia*	salt marsh and mangrove herbs
All *Sarcocornia*	salt marsh and mangrove herbs
Sandersonia aurantiaca	Christmas Bells
All *Scilla*	Blue squills
Sideroxylon inerme	White Milkwood
Siphonochilus aethiopicus	Wild Ginger
Stangeria eriopus	Stangeria
All *Stapelia*	Succulent Asclepiads
Syzygium pondoense	Pondo Waterwood
Syzygium legatii	

SPECIALLY PROTECTED INDIGENOUS PLANTS

SCIENTIFIC NAME	ENGLISH NAME
Encephalartos cerinus	Cerinus cycad
Ocotea bullata	Black Stinkwood
Warburgia salutaris	Pepperbark tree

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