

TECHNOLOGY

for **SUSTAINABLE LIVELIHOODS**



science  
& technology

Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



## TECHNOLOGY for **SUSTAINABLE LIVELIHOODS**

### *introduction*

The White Paper on Science & Technology (1996) has a broad vision, which focuses on maintaining cutting edge global competitiveness and improving the quality of life. Similarly, the National Research and Development (R&D) Strategy committed to “establish a mission technology for poverty reduction, to address one of the scourges of our age”. In both policy positions, broad interrelated themes fundamental to the expression of a sound S&T policy viz promoting competitiveness and employment creation; enhancing quality of life; developing human resources, and working towards environmental sustainability are clearly pronounced.

### *brief history*

The Sustainable Livelihoods Programme forms part of the Department of Science & Technology’s (DST) focus on Technologies with a Social Impact. It commenced in 2000/01 as part of the “Special Poverty Relief” programme funded by National Treasury to directly and indirectly create jobs and improve the quality of life for the poor, and it grew as part of the Department’s Technology Missions.

In line with the President’s decision to set up a separate Ministry for Science and Technology in 2004, the government’s commitment to growing gross expenditure on R&D to 1% of GDP by 2008, and the new governance model for the DST, the DST Poverty Reduction programme was restructured to meet the expanded mandate. The newly created DST Programmes included one designed as Socio-Economic Partnerships, into which the Poverty Reduction Programmes were absorbed under a broader ‘Social Impacts’ banner, and restructured into the Technology for Social Impact Sub-Programme, with Sustainable Livelihoods, and Sustainable Human Settlement as key programmes focusing on the urgent needs of our citizens who are less able to assert themselves in the market.

### *programme objectives*

The objective is to introduce and demonstrate innovative technology solutions for the beneficiation of local natural resources to support the creation of sustainable job and wealth opportunities in areas of deprivation. Its focus is on sustainability, and the development of downstream beneficiation SMME’s. Sustainable Livelihoods focuses on technology solutions and systems that are mature but do not have widespread application, but have the potential to achieve government’s broad objectives. It does this

by sourcing from the National System of Innovation (NSI) mature technology solutions for the beneficiation (value-addition) of local natural resources and transfers these to communities and community groups with a view of establishing sustainable Small, Medium, and Micro Enterprises (SMME’s). In this way wealth and job opportunities are created in the areas where technology and skills transfer has occurred. It does not focus on R&D but on adaptation of technology solutions on the ground to contribute to the establishment of new industries (wealth creation) and Black Economic Empowerment (BEE) opportunities.

In line with the country’s anti-poverty strategy, the Micro-Economic Reform Strategy (MERS), and other government Departments (e.g. Trade & Industry, Agriculture, Water Affairs and Forestry, and Environmental Affairs & Tourism), the DST has developed a focus on Agro-processing in support of the Accelerated Shared Growth Initiative (ASGISA), which aims to “promote opportunities for participation of marginalised communities in economic activity, and improve the quality of livelihoods of the poor”.

Agro-processing is one of the key sectors identified by government as sectors “that demonstrate strong potential for growth, employment creation and value addition”. Within this portfolio the DST is focusing on post-harvest production of finished value-added products in areas where the remote location does not present a logistical or financial disadvantage, and to establish sustainable (post-funding) SMME’s. The products tend to be high-value goods in a defined growing (or import substitution) market where the natural resources of the area are afforded a competitive advantage.

Supported agro-processing technologies focus on establishing larger demonstration interventions in Aquaculture and bio-prospecting in Essential Oils, and Indigenous Medicinal Plants with scientifically-proven medicinal properties. These are not the only focus technologies, but new focus areas are cottage industries and light manufacturing, to support Provincial Growth and Development Strategies. These are technology areas with strong markets but which require technology-based processes and solutions to improve quality and consistency of the products.

### *conclusion*

In support of the DST 10 year innovation plan, the programme is looking at growing its activities in support of the Farmer to Pharma Strategy which focuses at developing the bio-industry and indigenous knowledge to beneficiate indigenous bio-diversity and develop a leading pharmaceutical industry in South Africa.



# INDIGENOUS MEDICINAL PLANTS

## introduction

South Africa is blessed with a rich plant biodiversity and one of the 6 plant kingdoms in the world and almost 10% of all plants known to humankind occur exclusively within its borders. Plants, once a primary source of all the medicines in the world continue to provide humankind with new remedies. These resources have considerable potential to be combined with the innovation capacity within the country to grow our emerging bio economy through development of new medicines based on indigenous plants.

It is estimated that there are 28 million users of indigenous medicinal plant products and 255 000 traditional healers in SADC and that more than 80% of South Africans rely on indigenous medicinal plants for their health care. However, the current demand for numerous plant species exceeds supply and the combination of high demand; intensive wild harvesting of indigenous plant stocks and lack of major resources management and plant production interventions has resulted in paucity of numerous indigenous medicinal plants. The informal medicine trade has accelerated the increasing trend of several plant species, becoming extinct outside of protected areas. According to the SA Trade Directory of Indigenous Natural Products, this has already “killed more than 80% of the country’s high-value medicinal trees”, and as such bordering extinction.

Globally, natural products and their derivatives represent more than 50% of all drugs in clinical use today. This wealth is mirrored in the cultural diversity permeating the formal and informal systems of natural remedies, and has been used by Traditional Healers for centuries in the treatment and prevention of diseases. Indeed a large part of the day-to-day medicine are derived from the 30 000 medicinal plants found in the region, and 20 000 harvested tonnes of more than 1 000 plant species with a street-value of R2.7 billion are traded annually in the informal and commercial sectors for indigenous medicinal use. Currently these herbs are harvested unsustainably in the wild, or a few are in R&D propagation.

“Of the 30 000 medicinal plants found in the region, about 1 000 are harvested from the wild and actively traded in herb markets such as Durban’s Warwick Junction and Ezimbuzini markets. Only 5% have made it onto the formal market” Financial Mail, 04 Nov 2005.

## objective

The Ten Year Innovation Plan of DST identifies Farmer to Pharma (F2Ph) as one of five grand challenges that must be achieved by 2018. The F2Ph grand challenge focuses on the need to combine biotechnology with South Africa’s indigenous knowledge systems (IKS) and rich biodiversity to strengthen the emerging bio economy in the country. The DST Sustainable Livelihoods initiative on bio-prospecting on indigenous medicinal plants initiative promotes community production of indigenous medicinal herbs, **scientifically-proven to possess medicinal and or healing properties** to produce feedstock to support R&D with cultivated raw materials, as well as to enter into the medicinal herbs market, as sustainable producers. The challenge with that is multi-fold. There are currently no commercial nurseries producing seed stock (seedlings) to support farming (commercial propagation). Therefore to develop commercialisation, one has to develop the upstream seedling supply industries, and identify chemo-type of plants, and molecules being targeted for commercialisation.

## work in progress

In the Northern Cape, *Hoodia gordonii* (*Xhoba*), an indigenous plant traditionally used by the San people as a substitute for food and water is being propagated in Onseepkans and Pella. 2.5Ha each with about 60,000 plants per hectare have been established, and discussions to expand the propagation sites are underway. Together with land development, various assets have also been created. Research at the CSIR led to the isolation and structure elucidation of a novel glycoside molecule with appetite suppressant properties. This invention illustrated the economic potential of South Africa’s plant biodiversity and the importance of a well-developed scientific research capacity in the country to unlock this wealth.



Hoodia is listed under CITES (the Convention on International Trade and Endangered Species of Wild Fauna and Flora) which protects species threatened with extinction. This renders it illegal to export the plant from Africa without a CITES certificate issued by the proper authorities. The successful cultivation of Hoodia at Onseepkans and Pella contributes to the conservation and commercialisation of this species.

A plant indigenous to the Eastern Cape, *Pelargonium sidoides*, and is traditionally used by the communities to produce tinctures from the root to treat various respiratory infections and diseases. The plant is being harvested to almost extinction in the Eastern Cape and exported to Germany where a German Pharmaceutical produces a syrup from the root under the brand name Umckaloabo, and marketed all over Europe as a 'unique natural African traditional medicine', for the treatment of respiratory track infections, such as bronchitis, common coughs and colds. It is the 20th most sought after medicine in Germany.

A 20ha demonstration grow-out site is being established in the Senqu municipal area. Opportunities for the commercial expansion of this plant in the Eastern Cape are being explored. This will create post-harvest opportunities for the transfer of the extraction technology for the active ingredient, and the manufacture of tinctures and medicines.

The CSIR has proved that *African Ginger* possesses medicinal properties, and cultivated quantities are required to provide feedstock for further Research & Development (R&D) and trials. The plant holds commercial opportunities for KZN, and Mpumalanga, where it occurs naturally. Already a 20 ha site in KZN is being established to provide materials for R&D. The site is to be developed into a commercial production site, with primary-processing facilities meeting specifications for R&D inputs.

In the Northern Cape commercial grow-out trial pilots for *devil's claw* which occur naturally in the Northern Cape, are underway. These plants are used extensively as herbal remedies, both locally and abroad. A commercial model is to be established. Similar pilots for *Sutherlandia* and *Milk Thistle* are being conducted in Tsolwana in the Eastern Cape.

## from farmer to pharma

The DST Farmer to Pharma Grand Challenge, as part of the 10-year innovation plan identifies the need to combine biotechnology with indigenous knowledge system (IKS) and South Africa's rich biodiversity in an effort to position the country to competitively participate in the emerging bio-economy. The objective of the Farmer to Pharma Grand Challenge is to catapult South Africa into a leading position in biotechnology and pharmaceuticals by harnessing the country's rich biodiversity and indigenous knowledge using biotechnology tools. Biotechnology is one of the most recent technology waves of innovation that is reshaping the way we live. It offers solutions that address some of the major societal challenges such as healthcare, environmental degradation, food security and safety and energy supply. To help resolve this upstream bottleneck, there are various biotechnology solutions that need to be harness to benefit rapid development, and domestication of each individual plant, which help in standardisation.

The secondary aim of this cluster is to upscale to post-harvest primary processing and to manufacture supplementary health products and nutritional supplements, as well as to provide raw materials primarily for R&D, leading to further product development, as well as supply traditional practitioners thus contributing to bio-diversity protection in support of the DST 10year innovation plan and the Farmer to Pharma strategy. One of the ways of supporting Farmer to Pharma is to provide space within the sustainable livelihood projects for 1Ha trial grow-out plots in support of various R&D activities.

## conclusion

The DST Sustainable Livelihood programme has provided funding to the Council for Industrial and Scientific Research (CSIR); the Institute for Natural Resources (INR); and the Medical Research Council (MRC) to transfer medicinal plants propagation and value-addition technology for the establishment of SMME's that commercially produce indigenous medicinal plants. These are not the only institutions doing work in the space, and DST plan to expand collaboration with NSI institutions namely the ARC, Biotechnology Regional Innovation Centres (BRICs), Universities, and the Department of Agriculture, whose mandate it is to roll-out and support large scale farming operations.





## SIBONELO MEDICINAL PLANTS (SIPHONCHILUS AETHIOPICUS)

### introduction

African ginger (*Siphonochilus aethiopicus*) [*Wild ginger* (English); *indungulo*, *isiphephetho* (isiZulu)] is one of the most popular indigenous medicinal plants in South Africa, whose roots and rhizomes are chewed fresh to treat asthma, hysteria, colds, coughs & flu, and is regarded as Africa's natural anti-inflammatory. The plant species used to occur naturally in the Makhathini Flats in KwaZulu-Natal but has become regionally extinct owing to its popularity amongst traditional Healers, and over harvesting for medicinal purposes. However, in Mpumalanga and Limpopo it still occurs naturally in limited numbers. The plant is currently listed in the Red Data book of South African plants.

The name of this plant can be confusing, because despite some similarity in appearance, the essential oil of this plant does not contain any of the terpenoids present in the well-known but unrelated 'Indian' ginger (*Zingiber officinale*) plant. African ginger is a deciduous plant which bears cone-shaped rhizomes, and highly aromatic roots on which the medicinal value of the plant lies. Practically, to propagate the plant, rhizomes are lifted during the dormant season, divided and stored for further planting in the following growing season. It can also be propagated from seed.

### objective

Cultivated plant material is required for pre-clinical and typically Phase I clinical evaluation of medicinal plant products during the research and technology development phase. The DST Sustainable Livelihoods initiative aims to support early commercialisation by establishing community-based enterprises commercially producing African ginger, under good agricultural practices, to support R&D with cultivated bio-materials, and to establish a primary processing facility for the washing and drying of the rhizomes. The enterprise could also retail readily available and affordable herbal remedies, to people who suffer from common ailments such as colds and influenza. The secondary objective is to reduce pressure on the remaining wild populations of the plant, and thus contribute to bio-diversity protection.

### technology

The CSIR has undertaken a long-term research project to **scientifically validate** the claimed therapeutic properties of the plant. In this process, a new method for treatment of allergies was invented and patented. Additional product development (R&D) by the CSIR and its partners is currently in progress towards the development of finished medicinal products.



Micro-propagation by tissue culture is bringing this species back from the brink of total extinction. The use of biotechnology solutions is playing a role in the development of nurseries that will supply emerging and established farmers with plants suitable for commercial propagation.

A natural product such as African ginger with a long history of human use as a traditional herbal remedy, and subjected to the rigor of scientific investigation, has a promising future in the huge, international self medication market.

## achievements

Working with the community of Sibonelo in KwaZulu-Natal, 6ha of the plant have been propagated successfully. The rhizomes from these plants will be matured for harvesting by September 2008. These will then be utilised to propagate 20ha at the new site. The rhizomes take an average of 10 to 12 months to mature for harvesting.

One of the challenges in working with indigenous medicinal plants is that there are no nurseries producing the plants in quantities suitable for commercial production. The DST project is working with an established commercial nursery to develop the quantities required to initiate large-scale production. A commercial nursery has produced additional 70 000 tissue-cultured rhizomes under contract and these will be used to increase land under propagation to 20Ha. Opportunities to establish local commercial nurseries producing seed stock are currently being explored.

## markets

The demand for African ginger is high, both in the traditional medicine market, and with pharmaceuticals. It is currently being sold in the form of capsules containing the dried herb material. However, the biggest market is in the informal trade, typically healers who wish to treat the symptoms of colds, wheezing and related illnesses. The results of further R&D at the CSIR, indicates that cultivated materials would be required to commercialise the outcomes of their research on the efficacy of the plant extracts in treating specific respiratory conditions, mostly related to the allergic response mechanism of the human body. The increased exposure of people to environmental contaminants has created a huge demand for cheap and affordable treatments for such ailments.

## social impact

The cultivation and processing of medicinal plants offer great income earning opportunities to rural women in particular who are traditionally responsible for sustaining the livelihoods of their families. African ginger grows well in rural, semi-tropical areas in the country where there is a major need to establish viable enterprises in order to create new jobs. The processing of the plant material will provide opportunities for transferring of production skills to emerging entrepreneurs, contributing to the development of a local bio-industry.

## conclusion

The propagation site in Sibonelo, in KZN is proof that the plant can be commercialised. There are similar opportunities in the semi-tropical areas of the country, e.g. Mpumalanga, KZN, and Limpopo, to commercially cultivate the plant. The DST and DoA are in discussion to collaborate and elevate African ginger into an industrial crop. The ARC is doing exciting work on indigenous medicine gardens, and all these efforts needs to be harnessed to develop a new industry in support of the Farmer to Pharma Grand Challenge.





## ONSEEPKANS AND PELLA (HOODIA GORDONII)

### introduction

*Hoodia gordonii* is one species of the genus *Hoodia* an indigenous plant naturally occurring in South Africa in the semi-desert regions of the Northern Cape and Namibia. The San people call the plant *Xhoba*, and have traditionally used the plant as a substitute for food and water. *Hoodia* are spiny stem succulents resembling but unrelated to the cactus family.

South Africa, as a signatory to the Convention on Biological Diversity, is committed to protection and sustainable use of its biological diversity. *Hoodia gordonii* is threatened with extinction if international trade is not monitored and therefore it is listed under CITES (the Convention on the International Trade in Endangered Species of Wild Fauna and Flora). This means that *H. gordonii* cannot be exported from South Africa without a CITES certificate.

### the meeting of minds

*Hoodia gordonii* is possibly the best known encounter of indigenous knowledge and scientific research that resulted in a benefit-sharing

agreement between the CSIR and the San people in 2003. The CSIR isolated and patented the hunger-suppressing steroidal glycoside, known as P57 and the two parties agreed to share the benefits of the commercialisation of P57. With South Africa's rich indigenous knowledge from its biodiversity, this agreement sets a precedent of how owners of indigenous knowledge and practitioners of modern science can benefit in an equitable manner.

### objective

In support of the protection and development for beneficiation of indigenous bio-diversity, DST is promoting the establishment of community-owned commercial propagation of *Hoodia Gordonii*, which has a great market demand, thus the potential to provide wealth and job creation opportunities. DST in partnership with the CSIR is supporting projects at Onseepkans and Pella, where each site has 2.5 Ha of *H. gordonii*, grown under scientifically controlled conditions by members of the local communities. The harvested plant material will be exclusively sold to the licensee of the Hoodia technology originally developed by the CSIR.



## achievements

The well-drained soil and abundance of irrigation water available from the Orange River provides an ideal opportunity for controlled horticulture of crops that requires careful management of soil moisture conditions. *Hoodia gordonii* is cultivated at Onseepkans and at Pella by local community groups.

2.5Ha each cultivated with about 60,000 plants per hectare have been established, and discussions to expand the propagation sites are underway. Together with the land development, various assets have also been created: installation of drip irrigation systems, at both propagation sites, a telemetry station which uses GPRS technology to monitor and record agronomic data, an irrigation dam and a pump house; an office; ablution facilities and an eating area. Each 2.5Ha is attached to a 30Ha of Rose Geranium essential oil as discussed earlier.

## social impact

Onseepkans and Pella are impoverished communities where unemployment is a major problem. There are very few formal businesses in the area and any new economic activity can have a major impact on the lives of the surrounding communities.

Presently, 23 people are being employed at the Pella project while the Onseepkans project provides full time employment to 17 people and 5 casual workers are employed when needed. Both Onseepkans and Pella have reached a stage where community-based Section 21 Companies, Sidasoas and Pelsan respectively have been established to manage the enterprises.

Training is important in developing human capital and in addition to agro-technical and business training; all workers were given training in skills such as labour relations and productivity.

## conclusion

The challenges of poverty reduction, sustainable livelihoods, job and wealth creation and improvement of quality of life in economically-depressed areas are interconnected. The projects at Onseepkans and Pella provide much needed employment and capacity building opportunities for these communities. In addition these projects are important for the preservation of *Hoodia gordonii*, an indigenous medicinal plant under threat because of the great market demand for it.







## SENQU MEDICINAL PLANTS (PELARGONIUM SIDOIDES)

### introduction

*Pelargonium sidoides* is indigenous to South Africa, occurring naturally from Eastern Cape through to Lesotho. For centuries, indigenous people in the Eastern Cape, KwaZulu-Natal and Lesotho, have used the anti-bacterial properties of *Pelargonium sidoides* roots as a cure for coughs, upper respiratory track infection, and gastrointestinal concerns.

### under siege

The plant is indiscriminately harvested to extinction in the wild in the Eastern Cape and Lesotho, such that both governments have imposed a temporary ban on the wild harvesting and export of the plant. However rampant illegal harvesting continues, prompted by the demand of the roots. The roots are harvested and through middlemen sold to a pharmaceutical company in the Western Cape, where the roots are dried and desiccated then exported to Germany where a German Pharmaceutical produces a syrup from the root under the brand name *Umckaloabo*, and marketed all over Europe as a 'unique natural African traditional medicine', for the treatment of respiratory

track infections, strengthening immune system, bronchitis and common colds. It is the 20th most sought after medicine in Germany.

### stolen from africa...

In 1897, an Englishman, Charles Henry Stevens who was diagnosed with tuberculosis (TB) came to South Africa in search of a cure. In South Africa, he met a traditional healer Kijitse, who gave him a tincture made from the *Pelargonium* roots, which miraculously cured him. Fully recovered, Charles returned to England with his mysterious remedy-- which became popular throughout Europe as "Steven's Consumption Cure". Stevens coined the term 'Umckaloabo' to describe the plants. The word "Umckaloabo" originates from the merger of two Zulu words describing symptoms of diseases cured by the *Pelargonium* plants; namely "umkhuwane," which describes coughing and fever related diseases, and "uhlabo," which refers to chest pains.

In 1920, Dr Adrien Secheyay of the University of Geneva learned of Steven's cure and spent nine years treating over 800 patients in Switzerland with a homeopathic preparation of the tincture, culminating in his case study publication in 1929, and *Pelargonium sidoides* has been exported ever since.



The MRC has scientifically proven that this plant possesses immunomodulating properties, paving a way for DST funding for community commercial propagation. Internationally, *Pelargonium* extracts have been shown in numerous pre clinical and clinical studies, internationally to have benefits in health for self-limiting disease conditions.

### objective

The DST initiative aims at establishing commercial production of *Pelargonium sidoides*, primarily for the R&D for the development of value-added medicinal products, as well as feeding into the strong market for the roots of the plant. The plan is to establish demonstration grow-out pilots of 20Ha production sites similar to that of Rose Geranium. These would be equipped with primary processing facilities to produce materials meeting specifications for R&D. These would serve as models for economic grow-out and roll-out of the production of the plant.

### achievements

The CSIR identified a cultivation site owned by the Senqu municipality, at Zakhele village in Rhodes next to the river. The aim is to obtain access to 15Ha, however, to date a highly arable land of 7Ha has been identified, prepared, fitted with drip irrigation. 5Ha of *Pelargonium*

*sidoides* and 2ha German chamomile (*Matricaria recutita*) are being planted.

For more than 2 000 years German chamomile has been used as an antiphlogistic (*medicine that reduces inflammation and fever*). The flowers are used in herbal teas and the essential oil has a proven use as a carminative (medication that prevents the formation of gas in the alimentary tract or eases its passing). German chamomile is cultivated in winter as an annual crop and therefore complements the cultivation of *P. sidoides* which requires up to four years to mature.

A nursery for production of *P. sidoides* seedlings and semi-processing facilities on site is planned. This will include facilities where washing, drying and packaging of harvested products will be undertaken.

### way forward

The DST activity is in support of the Eastern Cape Department of Economic Development and Environment (DEDEA) to address the rampant destruction of the bio diversity of the Eastern Cape. The intellectual property and indigenous knowledge related to *pelargonium sidoides* require protection in line with the UN Convention on Biological Diversity (CBD) and the development of South Africa's bio-industry benefiting indigenous people and the holders of indigenous knowledge.







## WITDRAAI MEDICINAL PLANTS PILOT (DEVIL'S CLAW AND SUTHERLANDIA)

### introduction

The Ten Year Innovation Plan of DST identifies Farmer to Pharma (F2Ph) as one of five grand challenges that must be achieved by 2018. The F2Ph grand challenge focuses on the need to combine biotechnology with South Africa's indigenous knowledge systems (IKS) and rich biodiversity to strengthen the emerging bio economy in the country. The adoption of good agricultural practices is key to the development of the new economy. However, there is a need to domesticate and standardise plant materials for R&D and product development.

### objective

The DST Sustainable Livelihoods programme is supporting F2Ph through the establishment of demonstration grow-out pilots, while working with R&D researchers working on indigenous medicinal plants. In the Northern Cape, the programme is undertaking grow-out of two plants, viz., devils claw and Sutherlandia. Both are indigenous herbs that are used extensively both locally and overseas as herbal medicines and nutraceuticals.

The DST in partnership with the CSIR, is undertaking a grow-out pilot of Sutherlandia and Devil's Claw in Witdraai in the Northern Cape

to confirm the market, cultivation feasibility, and economic viability for the establishment of a sustainable medicinal plants business in the area, as well as to determine the difference in growth rates between irrigated and non-irrigated plants.

### devil's claw

Native to Southern Africa, devil's claw (*Harpagophytum procumbens*) is named for the miniature hooks that cover its fruit. It occurs naturally on the South African Highveld and is believed to cure a variety of illnesses. Today devils claw is consumed as in tea, in various supplements, capsules, and tablets. It is used by indigenous people for thousands of years in treating fever, rheumatoid arthritis, skin conditions, and conditions involving the gallbladder, pancreas, stomach and kidneys. The Khoisan people of the Kalahari use devil's claw root in remedies to treat pain and pregnancy complications.

There is evidence in various medical journals of scientific tests on the effects of devil's claw on pain. Examples are the journal *Rheumatology* and a study published in the journal *Joint Bone Spine*. The active ingredients in devil's claw are believed to be iridoid glycosides called harpagosides, which are found in the secondary root.

## sutherlandia

*Sutherlandia frutescens*, (*subs. microphylla*) is native in South Africa and common in the Eastern Cape and KwaZulu-Natal. It is known by many other names, a reflection of the many cultures that have benefited from its remarkable properties, like Unwele (Zulu), Motlepelo (Sotho), Cancerbush (English), and Kankerbos (Afrikaans). It has been used for hundreds of years by the native population and, later, by European settlers, who all attest to its effectiveness. Now, scientific trials are proving that the complex chemical compounds in the plant do indeed have application in the treatment of many serious ailments.

*Sutherlandia* is a shrub that rarely exceeds 1 m in height, though in ideal instances it can grow up to 1.5 m in height. It produces bright red flowers and is in bloom from June to December, with the seeds being contained in a green/red semi translucent pod. It has grey green leaves.

## achievements

The pilot sites are on two adjacent farms owned by the !Khomani San and are in principle suitable for the successful production of

devil's claw and *Sutherlandia*, respectively. The pilot is composed of 2 ha devils claw (approximately 2 years old) at Soekvlakte, and at Abbey where a nursery to germinate devil's claw seeds and produce seedlings has been established.

A solar-powered borehole pump was installed and land was fenced on a 4 ha scale. An environmental impact study (EIA) is under way and would be completed before the permit for the transport and cultivation of medicinal plants is obtained from DEAT, which would enable cultivation to occur.

The plan is to expand and scale-up the cultivation activities, and create an enterprise based on the processing of the two herbs has been completed, and awaits the completion of the legal compliance process. A similar *Sutherlandia* grow-out pilot is being established in Tsolwana in the Eastern Cape.

## conclusion

The cultivation and processing of these plants in arid regions of the country has the potential to contribute to conservation of the species while providing a sustainable business opportunity. The business could benefit from access to the ideal organic cultivation conditions for the selected crops in the unique Kalahari ecosystem.





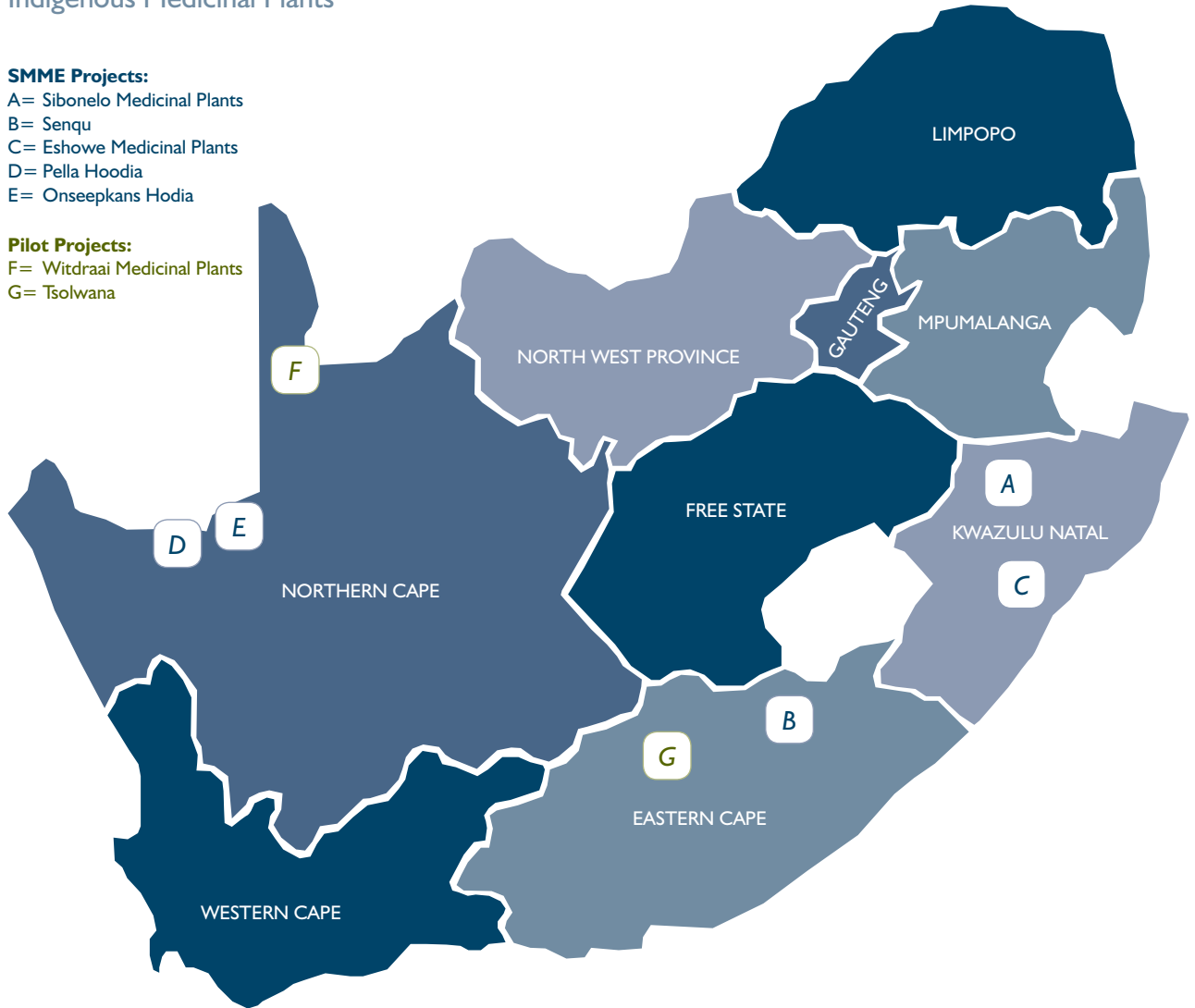
MAP indicating DST-funded initiatives:  
Indigenous Medicinal Plants

**SMME Projects:**

- A= Sibonelo Medicinal Plants
- B= Senqu
- C= Eshowe Medicinal Plants
- D= Pella Hoodia
- E= Onseepkans Hodia

**Pilot Projects:**

- F= Witdraai Medicinal Plants
- G= Tsolwana



### MEDICINAL PLANTS PROJECTS

Project Name	Women (+25) (Over age of 25yrs)		Youth (-25)		Persons with Disabilities		Men (+25) (over age of 25yrs)		Total	Total Full/T	Total Part/T
	Full/T	Part/T	Full/T	Part/T	Full/T	Part/T	Full/T	Part/T			
Tsolwana Medicinal Plants	4	0	0	0	1	0	0	0	0	4	4
Sengqu Medicinal Plants	0	0	0	0	0	0	0	0	0	0	0
Sibonelo Medicinal Plants	3	2	1	0	1	0	0	0	2	2	4
Widraai	1	4	0	0	1	0	0	0	4	4	4
<b>TOTAL:</b>	<b>8</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>8</b>

Women (+25)	Youth	Persons with Disabilities	Men (+25)	Total
<b>14</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>30</b>

47% 13%

0%

40%

Women:	15	50%
Men:	15	50%

### AQUACULTURE INITIATIVES

Project Name	Women (+25) (Over age of 25yrs)		Youth (-25)		Persons with Disabilities		Men (+25) (over age of 25yrs)		Total	Total Full/T	Total Part/T					
	Full/T	Part/T	Full/T	Part/T	Full/T	Part/T	Full/T	Part/T								
Small-scale Fish Farmer (35 projects)		79		8		48		1	1	345	1	344				
Hondeklip Bay Abalone Project	8		2		2	4			4	2	22	16	6			
Mandella Bay Kob Project					2					2	2	0	0			
Provincial Pilot Projects					4				4	4	4	0	0			
<b>TOTAL:</b>	<b>8</b>	<b>79</b>	<b>2</b>	<b>8</b>	<b>8</b>	<b>52</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>210</b>	<b>210</b>	<b>373</b>	<b>23</b>	<b>350</b>

Women (+25)	Youth	Persons with Disabilities	Men (+25)	Total
<b>87</b>	<b>70</b>	<b>2</b>	<b>214</b>	<b>373</b>

23%

19%

1%

57%

Women:	97	26%
Men:	276	74%





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