



HAND PRINT™
action towards
sustainability

Rooibos: A Biodiversity Economy at Risk



A Share-Net Resource Book

Reading-to-learn curriculum materials to support
Natural Sciences, Economic & Management Sciences
and Language learning areas



Acknowledgments

The Handprint resource books have been compiled by Rob O'Donoghue and Helen Fox of the Rhodes University Environmental Education and Sustainability Unit. Lawrence Sisitka was responsible for coordination and review, and Kim Ward for editorial review and production for curriculum and Eco-School use. Development funding was provided by CAPE. Cover illustrations are by Tammy Griffin.

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For this particular resource book, a very big thank you to Noel Oettle and Rhoda Malgas who have expert knowledge on Rooibos tea. The knowledge resources in this book are based on extracts from their various publications, which they willingly gave permission to use.



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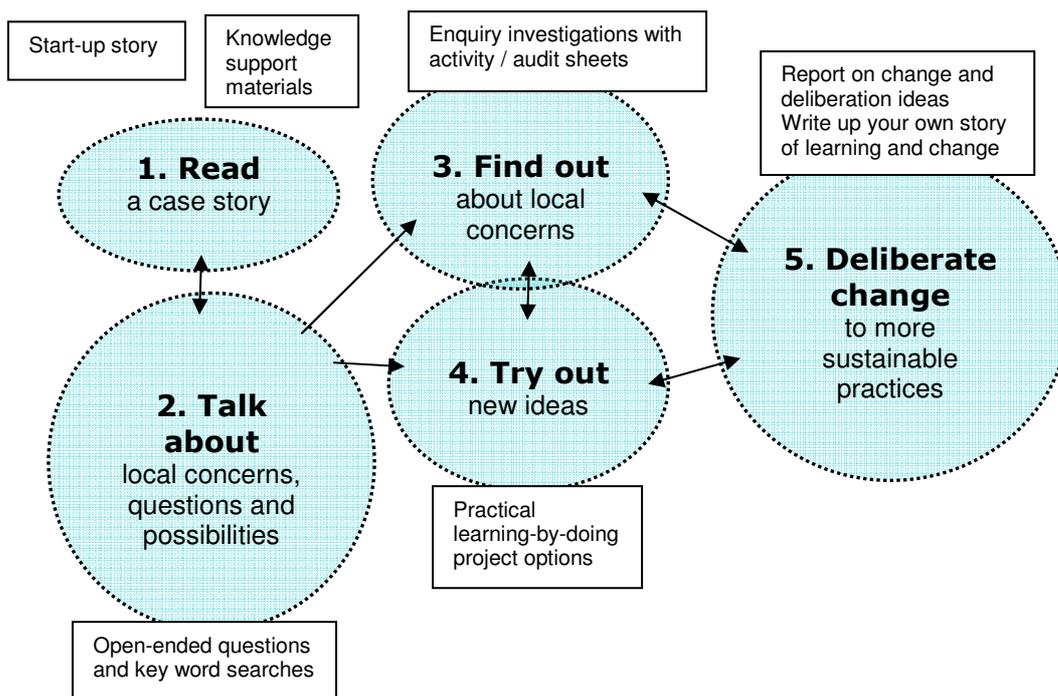
RESOURCE BOOKS

The **Handprint Resource Books** have been designed for creative educators who are looking for practical ideas to work with in the learning areas of the National Curriculum. The focus is on **sustainability practices** that can be taken up **within the perspective that each learning area** brings to environment and sustainability concerns.

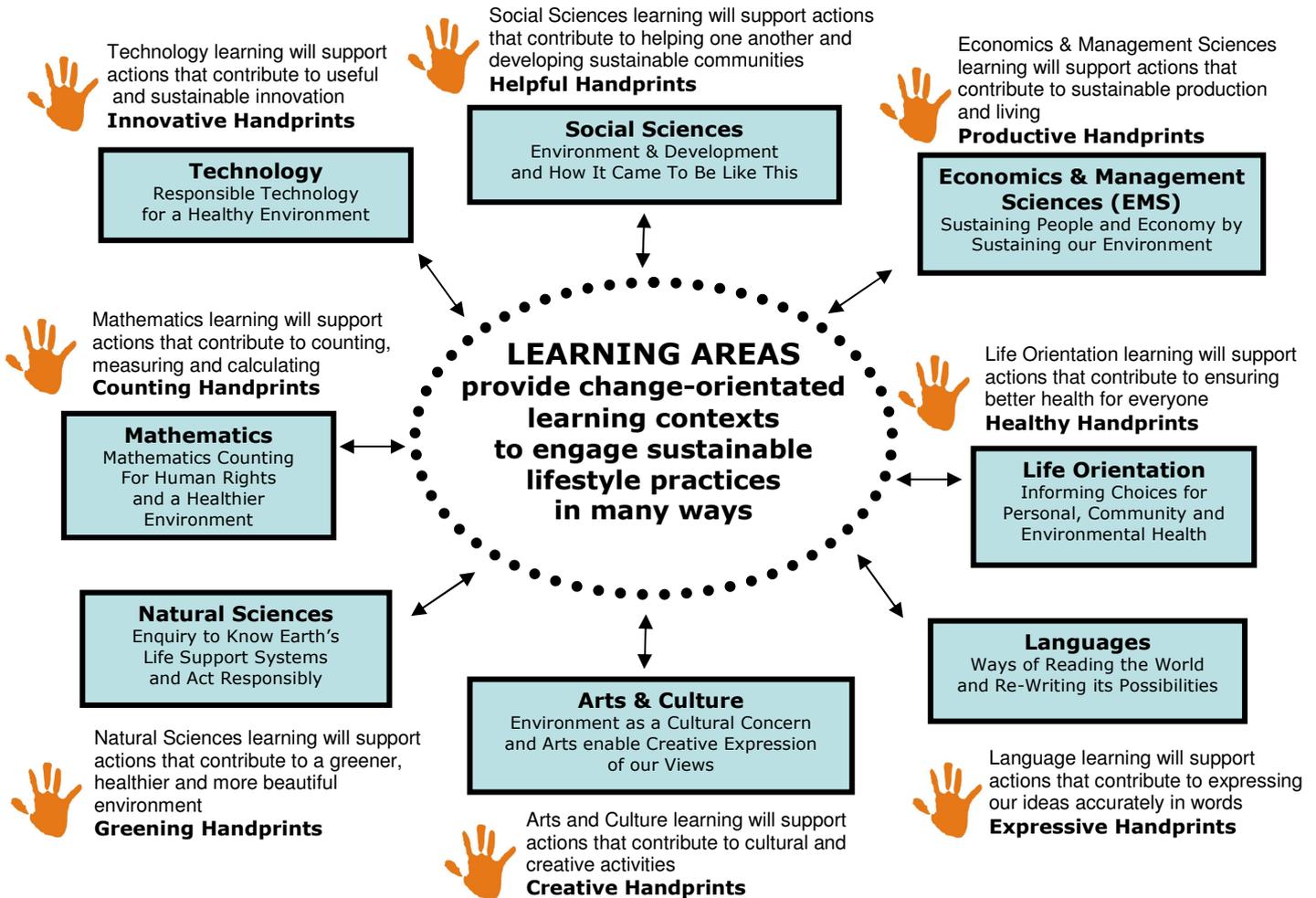
The resource books are intended to provide teachers with authentic start-up materials for change-orientated learning. The aim is to work towards re-imagining more sustainable livelihood practices in a warming world. Each start-up story was developed as a **reading-to-learn** account of environmental learning and change. Included are copies of the knowledge resources that informed those involved in the actual learning experiences described here. Working with local cases of learning and change has allowed us to develop the resource books around **locally relevant knowledge resources** and **practical learning activities** that relate to our African context. We are grateful to teachers and Eco-School support groups who have willingly shared their learning experiences and activities.

The **Handprint Resource Books** are an attempt to work from authentic cases of environmental learning and change. They combine some of the best teaching and learning tools that are being used to support change-orientated learning in the everyday realities of our South African schools. The resource books include:

1. **Start-up stories** with **knowledge support materials** (*Reading for information to build up a picture*)
2. Questions to **talk** about (*Talking to clarify issues and to plan local enquiry*)
3. Tools to **find out** about local concerns (*Writing about and reporting on local issues*)
4. Things to **try out** (*Writing up and reporting on what has been tried out*)
5. Ideas to **deliberate** (*Discussing, weighing up and recording decisions that will allow us to 're-imagine and re-write' our sustainability practices in a warming world*).



Change-orientated learning & the curriculum



The activities in this book can be used to support learning in the **Natural Sciences, Economic & Management Sciences** and **Language** learning areas, and can contribute to the development of **Greening, Productive** and **Expressive Handprints**.

Teachers should consult the learning outcomes and assessment standards and should adapt the activities to suit their grade requirements.

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Rooibos: a biodiversity economy at risk

Key words

adapted biodiversity economy biome endemism monoculture



Our social science class is learning about economics. Our teacher explained that for many years, people looked at economics and the natural environment

separately. In the last ten years or so people realised that they needed to be looked at together. The economy is dependent on the natural environment and what happens in the economy has an impact on the natural environment. Our teacher described a relatively new concept that is based on the link between the economy and the natural environment. This is called the 'biodiversity economy'.

I live in the Western Cape and have often heard about our special natural environment. In our natural sciences class we learned that our Cape Floristic Region is a 'biodiversity hotspot'. Many of the plants are endemic, which means that they only grow in this part of the world. There is also an incredible diversity of plants – one of the highest in the world.

Our teacher explained that we would be exploring the biodiversity economy of the Cape Floristic Region. For homework we had to find out something about this region, particularly related to its economic value. My dad works in nature conservation so I asked him if he could help. He gave me something from the SANBI Biodiversity Series. It was a whole article called "Building the Biodiversity Economy for the CAPE Floristic Region." **(SM 1)** I found out that the Cape Floristic Region has been declared a World Heritage Site as it has

"outstanding universal significance to humanity". Wow! This is mostly because of its rich natural environment.

In class the next day we were given our project for the following week. Each of us was to explore a particular resource in this biodiversity economy and report back to the class in the form of a poster presentation. Options included rooibos tea, aloe vera, wild flowers, nature-based tourism, bees and fish. We were given a paragraph for each option with information to guide our research. I chose the one on rooibos tea as it fascinated me. Here it is:

The story of rooibos tea was initially written as a conservation success story of how an indigenous plant was grown to develop a biodiversity economy of the region. Although rooibos tea is both an indigenous plant and a proudly South African product, the modern farming practices now used to produce it are leading to habitat change that is impacting on the biodiversity of the region. Sustainable farming practices are thus not only about growing indigenous plants but include agricultural practices that produce food to feed people with the minimum transformation (change) and degradation of the environment.

I went back to my dad for guidance. He knew of a lady called Wendy Paisley who worked for C.A.P.E. One of her main responsibilities is to share information between people working in biodiversity related fields in the Western Cape. My dad was sure she would know people who had information on rooibos tea. I was a little nervous, but called her the next day for any contacts. She was great and knew of two people who had done a lot of research into rooibos: Rhoda Malgas and Noel Oettle. She gave me

their contact details. Rhoda seemed very pleased that a young person was so interested in rooibos tea and said she'd done her masters research on wild rooibos and had written a number of publications with Noel. She emailed them through to me by the next day. I now had five research reports to read.

My plan was to read through the reports and select three to four themes for my poster. I'd then phone Noel, which Rhoda suggested I do, and ask him a few questions about the issues of rooibos tea, particularly related to the biodiversity economy.

The reports were mainly based on research done in the Suid Bokkeveld region. As an introduction I put together a page of information that describes this region (**SM 2**). The area has extreme weather conditions and yet so many different kinds of species grow there. I learned that diversity increases when two different biomes meet. In this case, the Suid Bokkeveld is the meeting point of the Succulent Karoo and Cape Floristic Kingdom which explains its huge range of biodiversity and endemism.

I assembled another page of information on the properties of rooibos tea (**SM 3**). The rooibos species has many different kinds of varieties, but only grows in this part of the world, i.e. it is endemic to the Western Cape. Rooibos tea is well adapted to grow in extreme weather conditions. One adaptation is its needle-like leaves, which reduce transpiration on hot days, while its long tap root allows it to drink water deep beneath the surface.

Almost all the reports mentioned the Heiveld co-operative and spoke of it as a success story of the area. So I put together a page of information on this (**SM 4**). This co-operative is made up of small-scale farmers in the area who have

decided to join together so that they can share their skills and support each other. An interesting thing about the Heiveld co-operative is that it is mainly focussed on harvesting wild rooibos.

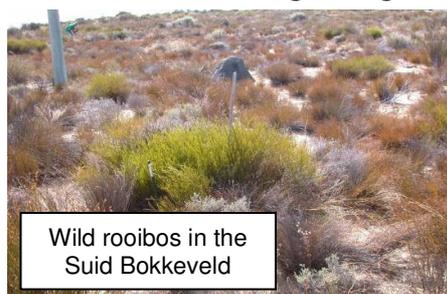
Now my project got really interesting. Rooibos is indigenous to the area, but the way that cultivated rooibos is being grown, in large monoculture stands, is threatening the biodiversity of the region, including wild rooibos tea. After an interview with Noel Oettle, I realised the seriousness of this. It is predicted that agriculture in South Africa will be greatly affected by climate change. The Cape Floristic region is already experiencing signs of this negative impact: droughts are becoming more frequent and the weather patterns are increasingly uncertain.

I decided to put together some information on the differences between wild and cultivated rooibos (**SM 5**). Cultivated rooibos tea has a number of properties which make it a good choice for cultivation on a large scale to make a profit. For example, it produces more seeds than wild rooibos, can be harvested every year and is fast growing. However, compared to wild

rooibos it is much more vulnerable to changing weather patterns, doesn't recover as well after fires (which will increase with hotter days) and is more threatened by disease, drought and pests. Noel

Oettle kept emphasising the importance of protecting wild rooibos, especially in the light of climate change.

In my presentation to the class I described how the biodiversity economy is being threatened by the way rooibos tea is being cultivated. Cultivated rooibos is threatening the future of many species in the Cape Floristic Region, including wild rooibos, which is better adapted to facing changing climates.



Glossary

Adapted: a plant or animal that has characteristics that are well suited to its environment.

Biodiversity economy: an economy that is directly based on the goods and services provided in the natural environment.

Biome: a large naturally occurring community of flora and fauna occupying a major habitat.

Endemism: when plants or animals only occur in a particular area.

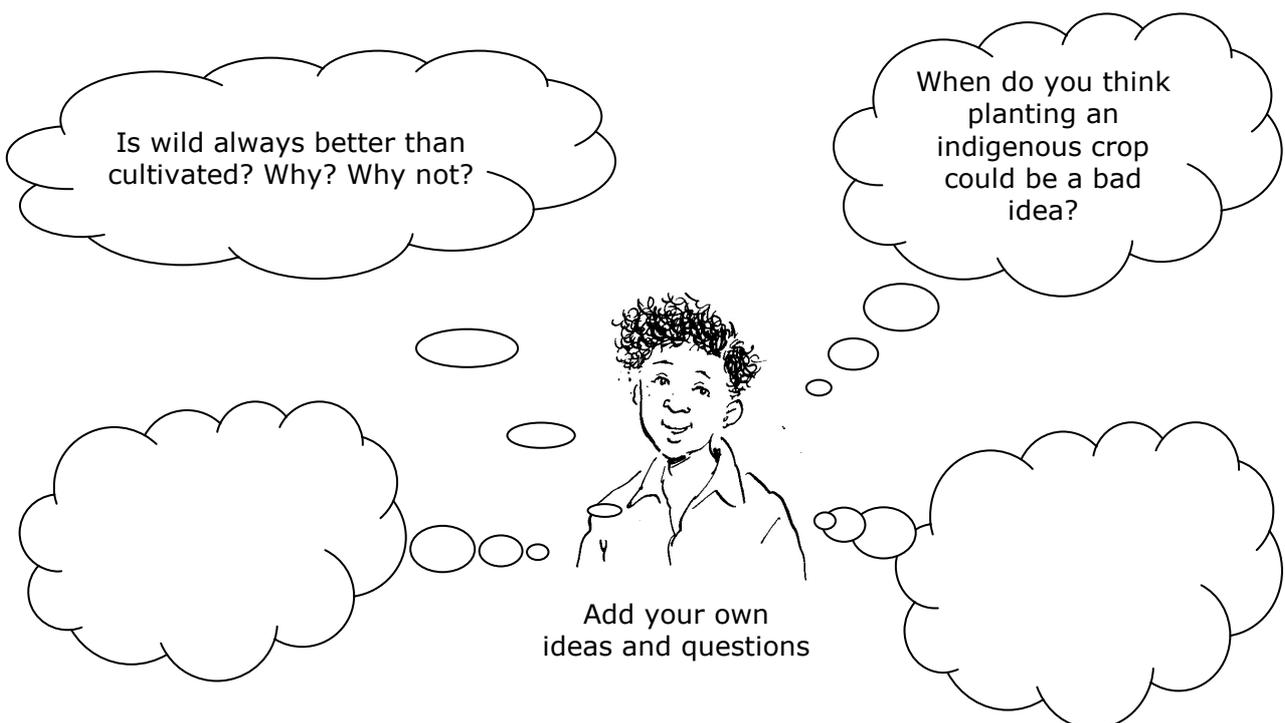
Monoculture: the practice of producing or growing one single crop over a wide area.

Transpiration: loss of moisture through plant leaves.

Comprehension Questions

1. Why should the economy and natural environment be viewed as dependent on each other?
2. What is special about the Cape Floristic Region?
3. Although rooibos is an indigenous plant, why is cultivated rooibos a problem for the biodiversity of the area?
4. Which two biomes meet at the Suid Bokkeveld region?
5. What type of rooibos tea is mainly harvested by the Heiveld co-operative: cultivated or wild?
6. What did you learn about the economic value of the Cape Floristic Region? **(SM 1)**
7. What words would you use to describe the Suid Bokkeveld? **(SM 2)**
8. Name three properties of rooibos tea that you find interesting. **(SM 3)**
9. In what way is the Heiveld co-operative a success story? **(SM 4)**
10. What are the main differences between wild and cultivated rooibos? **(SM 5)**

Discussion Points



FINDING OUT ACTIVITY

Find out about general attitudes to rooibos tea. You could get your learners to interview five to ten people. Questions to ask could include:

- Do you enjoy drinking rooibos tea?
- What do you think about it being an indigenous crop?
- Are you aware of any environmental issues associated with rooibos cultivation?
- Would you be willing to drink wild rooibos rather than cultivated, even though it is more expensive?

TRYING OUT ACTIVITY

Design an educational campaign to teach local people in your neighbourhood about the problems of cultivated rooibos. Learners could design pamphlets or posters which could be distributed around the neighbourhood. Be creative – there are many different possibilities for learners!

DELIBERATION IDEAS

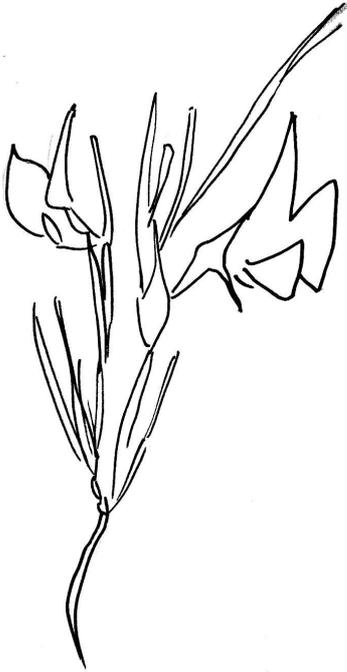


To deliberate is to think carefully about, to consider, to discuss in a focused way, to weigh up and debate. Here are some ideas to support this process in your learners.

The Heiveld co-operative have been selected for a competition and if they win they will be awarded a large sum of money to extend their enterprise (see **support material 6**). Deliberate with your learners the pros and cons of winning this competition. Consider the well-being of the small scale farmers, the sustainability of rooibos tea as well as the health of the Cape Floristic Region. Something to consider, in the deliberation, is the nature of large-scale operations compared to small-scale ones.



BUILDING THE BIODIVERSITY ECONOMY OF THE CAPE FLORISTIC REGION



When the Cape Floristic Region (CFR) was declared a World Heritage Site in 2004, it said something significant to the people of South Africa: the world values this region as a site of “outstanding universal significance to humanity”. There are many reasons why people value this place: its landscapes, waters and living things. For a start, it is simply stunning.

Whether it is the grandeur of the coastal and mountain scenery, or the perfect detail of the tiniest flower, the region is a visual inspiration. The biodiversity of the region - the diverse and unique ecosystems and species of the land, rivers and sea - is valuable in its own right, as well as in terms of the many goods, services and opportunities it offers to the people of the region and the world. This biodiversity has also given rise to much of what is culturally unique about the region: the snoek fishery that sustains thousands of coastal dwellers; a belief in the healing powers of “buchu brandy”; thatched roofed cottages - these are all quintessentially Cape.

The people of the Cape have sometimes been slow to benefit from their biodiversity heritage. The Convention on Biological Diversity, as one of its three aims, emphasizes the need for biodiversity benefits to be shared with the people of the countries of origin of that biodiversity. Slowly but surely, the communities with traditional knowledge of healing plants, and the government agencies with the mandate to conserve the country’s floral riches, are starting to derive benefits from the multinationals that invest in their beneficiation.

It is important to understand how the biodiversity contributes to the economy of the region (i.e. the value of the biodiversity economy). When people know how valuable it is, they will be more likely to protect it. Some elements of the biodiversity economy are obvious: the value to communities of harvests of fish, reeds, flowers and tea; the value to the economy of nature-based tourism; the income derived from the sale of game animals and the issuing of licenses by government. Many of the poverty relief programmes that the South African government has developed to provide short term employment for the destitute, have been created in the biodiversity sector.

The aspect of biodiversity that is most difficult to quantify, and therefore most often overlooked, is what we call “ecosystem services”, those essential processes like water purification, soil generation, erosion control, pollination and pest control that well-functioning natural systems carry out automatically. We take these services for granted, until they are no longer there. And then, when we have to pay scientists and engineers to restore or artificially replicate the essential life-support systems that nature provides freely, we start to count the cost.

It could be argued, that if people were expected to pay for the services that ecosystems provide, nobody would question the value of biodiversity. Were these services to be paid for by users, the agencies which remove thirsty alien vegetation from water catchment areas, that conserve the stands of fynbos in which honeybees over-winter, and manage the estuaries that act as nurseries for many marine fish species, would no longer have an overstretched budget.

It isn't easy to put a monetary value to the biodiversity of the CFR, but a recent natural resource economics study estimated the total economic value of the CFR as at least R10 000 million per year, which is equivalent to over 10% of the regional Gross Geographic Product for the Western Cape.

A detailed natural resource economics study conducted on the Agulhas Plain found that, in 1999, **fynbos flowers** harvested from natural vegetation on the Agulhas Plain contributed about R10 million to farm incomes. In that same year, the fynbos flower industry as a whole generated a gross income of nearly R150 million from exports and local sales. Of this, about R86 million worth of flowers were harvested from natural vegetation. In terms of other fynbos products, about R12 million worth of buchu is exported each year, its oil being used to make food flavourants and cosmetic fragrances. And about R5.6 million worth of thatch was harvested in 1999. Marine resources such as linefish, rock lobster, abalone and bait species, contribute a huge amount to the provincial economy, with the industry being worth over R1 300 million per year.

In addition to these harvested products, fynbos vegetation also contributes significantly to the success of the deciduous **fruit** industry and to the **honey** industry. About half the honey produced in the fynbos region comes from bees collecting from fynbos flowers, amounting to about R5.8 million per year. In addition, Cape honeybees carry out an essential pollination service in the deciduous fruit producing areas of the Western Cape. These bees forage in the fynbos for most of the year when the fruit trees are not in flower. Without the fynbos to sustain the bee hives, the fruit industry could not be sustained.



Tourism is the fastest growing sector of the South African economy. In the Western Cape, which has very little mining or heavy industry, tourism and agriculture are two of the most important economic sectors. It is estimated that the scenic beauty and the natural and cultural heritage of the Western Cape attract 24% of South Africa's foreign visitors. A recent survey of tourism trends in the Western Cape revealed that activities relating to nature and wildlife are among the most significant reasons why foreigners visit the Western Cape (exceeded only by shopping and nightlife!). Caring for the natural environment is therefore a wise investment in sustaining tourism in the province.

Reference

SANBI Biodiversity Series 4. (2006). Chapter 5: Building the Biodiversity Economy for the CAPE Floristic Region.



A DESCRIPTION OF THE SUID BOKKEVELD

The Suid Bokkeveld is situated on the south-western margins of the Northern Cape Province of South Africa between 31° and 32° South and 19° and 19°15' East. This is an area of rugged sandstone and shale plateaux, incised by deep canyons. The annual average rainfall of between 125 and 350 mm falls mostly in the cooler winter months. The Suid Bokkeveld lies on the boundary between two biomes of global importance as centres of endemism and biodiversity: the Succulent Karoo and the Cape Floristic Kingdom. These biomes host a vast array of drought tolerant plants, adapted to summer drought and light winter rains. Within the Cape Floristic Kingdom a unique assemblage of plants known as “fynbos” (named after the fine leaves of the plants) occurs on the acidic soils derived from ancient sandstones. The Suid Bokkeveld is part of the northernmost extreme of the fynbos biome, and is home to many endemic plants, including locally adapted sub-species of *Aspalathus linearis*, known locally as rooibos. Rooibos is used to make a herbal tea that is increasingly popular in local and foreign markets. It is naturally restricted to the northwestern region of the fynbos biome, and only grows in South Africa.



The flora of the Succulent Karoo are adapted to even dryer and more extreme climatic conditions than the fynbos, and typically occur on high pH (alkaline) soils derived from shale. Adapted to winter rainfall conditions, the plants of the Succulent Karoo are able to survive under conditions of extremely low rainfall. They include the world famous and almost completely endemic ‘stone plants’ that literally look just like stones, until they flower. The Suid Bokkeveld is a transitional zone between these two biomes, and presents a living laboratory for adaptation of plants across zones of soil and climate. Recent drought events and higher recorded temperatures have given rise to speculation that global climatic change is impacting on the area. This speculation is fuelled by scientific predictions that the onset of the winter rainfall season in the area is likely to be later in the season, and that droughts within the rainy season will become more frequent. Higher temperatures and lower levels of precipitation are also forecast.

The evergreen scrub of the fynbos biome has evolved within a regime of regular fire events caused by occasional electrical storms in the summer season. Regeneration of many of the indigenous plants (including rooibos) relies upon fire, without which the seed of most perennial plants will not germinate.

Over many years, excessive burning of veld, over-grazing and cultivation of rooibos and cereals have led to the degradation of large parts of the fynbos biome. Land transformation as a result of the expansion of rooibos tea plantations has been identified as a major threat to the biodiversity of the area. More recently, the upward trend in temperatures, accompanied by drought events has provided a foretaste of the predicted effects of global climate change on the west coast of South Africa. As it is a relatively low rainfall area, with low-income levels, the land and people of the Suid Bokkeveld have felt the impact of these changes more severely than most. The drought of 2003 caused large-scale fatalities in rooibos plantations, and has been followed by another below-average rain year. Land suitable for rooibos production is limited by soil type and depth. Only relatively small pockets of suitable land occur in the Suid Bokkeveld.

Reference

Oettle, N. (date unknown). Suid Bokkeveld Case Description. Environmental Monitoring Group.



ROOIBOS TEA PROPERTIES

Rooibos tea is well known as a legume (of the pea and bean family) that occurs in the Cederberg and surrounding areas. Cultivated rooibos is a close relative of wild rooibos, in other words rooibos that grows wild in the veld in areas where it occurs naturally. Although wild and cultivated rooibos differ from one another, they share the same scientific name. The scientific name for rooibos is *Aspalathus linearis*. Rooibos is one of 278 species of the *Aspalathus* genus. The second part of the name (*linearis*) refers to the shape of the needle-like leaves from which the tea is produced. The growth forms of rooibos vary greatly. Bushes grow to a height of between ½ m and 2 m, depending on the growth form. Some bushes take a round form with runner-like branches, whereas others grow tall and upright.

Rooibos occurs in fynbos areas that experience wet, cold winters and hot, dry summers. Wild rooibos grows in mountainous sandstone areas with acid soils that are characterised by their low nutritional value. Wild rooibos grows in amongst other species of plants, and this enhances its chances of survival. Wild rooibos and cultivated rooibos flourish in similar habitats.

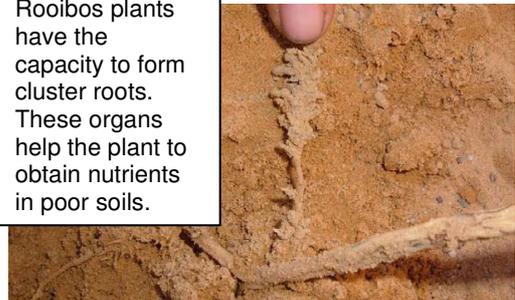
The narrow needle-like leaves, with very limited surface areas minimize the loss of moisture on hot days. These fine (or, in Afrikaans, "fyn",) leaves are typical of the fynbos area. Wild rooibos has a long tap root that is able to access water deep under the ground. It also has shallow lateral roots that are equipped with cluster roots. The clusters are tight bundles of hairy roots that occur at intervals along the lateral roots.

The plant uses the water that it draws up with its tap root in a unique manner: it manufactures organic acids that are able to dissolve plant nutrients in the topsoil. These acids are released by the cluster roots to dissolve minerals such as phosphate, which in turn are absorbed by the roots to provide the plant with the nutrition that it requires.

Nitrogen (N_4) is a plentiful naturally occurring gas, and is an essential component of all proteins. Plants use nitrogen to build new cells, but can only use it in certain forms, and are unable to abstract it from the air. Subterranean bacteria perform this important ecological role – the transformation of nitrogen (N_2) into usable ammonia (NH_4) or nitrate (N_4). These bacteria occur in the nodules on the roots of rooibos plants. Certain bacteria occur only on the roots of rooibos plants. Rooibos thus provides an important link between these bacteria (micro-organisms) and the other plant species in its environment such as larger shrubs and trees. The shallow lateral roots are also able to rapidly absorb water from any light precipitation before it evaporates and are thus in a position to utilize moisture from drizzle, mist and even dew. Rooibos plays an important role in recovery of plant communities after fire by making plant nutrients available to other plants.



Rooibos plants have the capacity to form cluster roots. These organs help the plant to obtain nutrients in poor soils.



Reference

Rhoda, M. and Noel, O. 2007. *The sustainable harvest of wild rooibos: a guideline for the Northern Cederberg and the Suid Bokkeveld plateau*. Environmental Monitoring Group Trust. South Africa.



HEIVELD CO-OPERATIVE

Most people living in the Suid Bokkeveld rely on small-stock farming, rooibos tea production and social grants as their main sources of income. Most of the small-scale rooibos tea farmers in this region are members of the Heiveld Co-operative, a registered cooperative established in 2001.

This co-operative has enabled rooibos tea farmers in this sparsely populated district to organise themselves within a democratic structure, to share the cost of equipment and infrastructure, and to supply a high-end overseas market that would have been extremely difficult to access individually. As a collective, members are now able to compete in the market place with the large rooibos tea producers. The co-op has grown from 14 to 36 members in just five years and the number of women has increased from 2 to 9. There have been impressive financial results due to sound management and healthy trading relations with alternative trade clients in nine countries.

The lack of agricultural extension services in the past meant that members of the Heiveld Co-operative either harvested wild rooibos tea from the veld or cultivated it without pesticides or artificial fertilisers. This meant that the product was in effect "organic". Members of the Heiveld Co-operative were certified as organic producers and now supply a niche market of consumers in nine countries who are willing to pay a premium for organic, fairly traded products. The co-op currently attracts the highest price per kilogram in the rooibos tea industry (R18.50/ kg in 2004). This has benefitted its members as the tea planters and harvesters receive a minimum wage that is nearly twice the legislated minimum for the area!

Through the co-op, members have been able to share knowledge and skills of sustainable production, and this is helping the group to address problems like soil erosion and crop losses due to drought. Farmers have analysed the impacts of extreme climate events on production, and identified ways to reduce vulnerability to climate risk in their farming practices, including enhancing retention of soil moisture by enhancing organic content of the soil, reducing run-off and dehydration by wind and retaining populations of wild rooibos. Enhanced indigenous practices for conserving biodiversity and controlling wind and water erosion in rooibos fields have prevented soil loss and damage to rooibos plants. Shelter belts in cultivated lands also provide a refuge in the fields for the natural predators of the pests that attack rooibos. The shelter belts, with their mulched strips, also promote retention of carbon in the soil, with associated benefits of enhanced fertility and retention of rain water.

Involvement in the Heiveld Co-operative has been an opportunity for members of the Suid Bokkeveld community to develop knowledge, skills, confidence and a sense of self-worth. Through harvesting and selling their tea to an overseas niche market, co-op members are contributing economically and socially to their families and community. By farming more sustainably they are caring for the local and global environment. The members of the Heiveld Co-operative are making a difference.

References

Oettle, N. (date unknown). Suid Bokkeveld Case Description. Environmental Monitoring Group. SANBI Biodiversity Series 4. (2006). Chapter 5: Building the Biodiversity Economy for the CAPE Floristic Region.



WILD ROOIBOS COMPARED TO CULTIVATED ROOIBOS

Rooibos is a natural resource of great value in historical, cultural, economic and biodiversity terms. The great variety of growth forms of rooibos reflect the many wonderful ways in which this plant has succeeded in adapting to a wide variety of habitats. Production of rooibos tea for the market is largely based upon the Nortier variety, which is grown in extensive plantations. This variety of rooibos is a fast growing plant that is less resistant to droughts and pests than many other varieties. In the past rooibos research focused only on the production of the Nortier varieties. In the light of what we are learning about climate change and how important it is to conserve the diversity of varieties of plants to facilitate adaptation to changed weather conditions, the conservation of the various varieties of wild rooibos is of great significance. Because harvesting and trading of wild rooibos is an important source of income for many families in the Cederberg and on the Bokkeveld Plateau, the conservation of this resource is also of importance for the survival of these communities.

One primary difference between cultivated and some types of wild rooibos is their response to fire. Cultivated rooibos dies in fires. Nevertheless, fire is advantageous for the germination of the rooibos seeds that lie scattered about in the sand. Fire cracks the hard outer layer of the seed and enables water to penetrate the seed so that it can germinate. In the case of certain types of wild rooibos the above-ground parts will burn, but the plant has the capacity to re-grow from the base of the trunk as a result of stored nutrients stored in the enlarged roots. Table 1 summarises the main differences between cultivated and wild rooibos.

Table 1: Main differences between wild and cultivated rooibos (Louw 2006)

| Trait | Wild | Cultivated |
|----------------|---|--|
| Morphology | Prostrate growth form | Erect growth form |
| Growth | Post-fire sprouting from basal stem Slow-growing | Post-fire mortality Fast-growing |
| Reproduction | Post-fire seed germination Low seed output | Post-fire seed germination High seed output |
| Resilience | Resilient against pests, drought and Disease | Susceptible to pests, drought and disease |
| Harvest regime | Generally harvest once every two years | Harvest once every year |

The above table indicates that wild rooibos is more resilient than cultivated rooibos, and is able to survive climate change better. One of the reasons wild rooibos is more resilient is because it has an enlarged underground root known as a lignotuber. This woody organ stores plant nutrients under the ground from which the plant draws food to grow when the leaves and branches have been burned, grazed or harvested. These types of rooibos thus have the ability to re-establish relatively fast after fire. The resprouting plants help to prevent wind and water erosion and also help other plants to re-establish.



References

Louw, R. 2006. *Sustainable harvesting of wild rooibos (Aspalathus linearis) in the Suid Bokkeveld, Northern Cape*. Leslie Hill Institute for Plant Conservation. University of Cape Town.

Rhoda, M. and Noel, O. 2007. *The sustainable harvest of wild rooibos: a guideline for the Northern Cederberg and the Suid Bokkeveld plateau*. Environmental Monitoring Group Trust. South Africa.



VOTE FOR THE HEIVELD CO-OPERATIVE!

Email sent out to encourage people

Dear Colleague,

Most of you will be familiar with the Heiveld Co-operative, a collective of small-scale farmers who produce fine quality organic and fair trade certified roobos tea. Over the past six years Heiveld members have made a significant contribution to ecologic research, and have applied the findings in their farming practice. The Heiveld has also contributed to the development of its local community, which was severely disadvantaged in the colonial and Apartheid eras. In recognition of its contribution to environmentally sound economic development, the Heiveld has been selected as one of 12 finalists in the 2008 BBC World Challenge competition.

The BBC commissioned a film reflecting the achievements of each of the finalists, and these films are now being broadcast globally at regular intervals on the BBC World Service. Voting is now open on the BBC website, and you can also view a short film clip from the movie on the site:

http://www.theworldchallenge.co.uk/html/finalists_08.html#project8

Please spread the word amongst your colleagues, partners, family and friends. It will mean a lot for the Heiveld to win this competition: not only will the funds be invaluable for expanding their tea court, but they expect it will also boost sales of their tea. With a bumper harvest in its store, this is very important to the Heiveld.

Please take a few minutes and vote for the Heiveld. Each person may vote once (and only once), and everyone's vote will help the Heiveld to achieve a better future. If you have kids in high school, ask them to share this with their classmates. The film is both educational and inspiring.

Thank you for your support!

Noel Oettlé

Rural Programme Manager

Competition: http://www.theworldchallenge.co.uk/html/finalists_08.html#project8

The **Heiveld Cooperative** gets small-scale farmers a fair price for their organic Roobios tea.

The highlands of South Africa's Cape are one of the country's poorest areas. The low rainfall and poor soil in the area make farming difficult but these conditions are perfect for Roobios plants. The local Koisian people have long sworn by the medicinal properties of Roobios tea.

Free from caffeine, the tea has now become popular among the health-conscious. Koisian farmers were routinely exploited in a market dominated by big agriculture companies. As Heiveld's Barry Koopman remembers, "We didn't know much about business and marketing. You would just take your tea to a company and they would say 'it's this much per tonne', and you'd just have to accept it. You couldn't protest."

But in 2001, 14 Koisian farmers formed the Heiveld Cooperative to win a better deal for themselves. The Cooperative took charge of every stage of tea production, from growing to marketing to export. They were helped by a new consumer preference for fair trade and chemical-free produce. Heiveld tea is now on sale in the US, Australia, New Zealand and much of Europe and the marketing team is developing taste combinations to crack new markets.



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Handprint resource books available from Share-Net

| TITLE | LEARNING AREAS COVERED (BROADLY) |
|--|---|
|  1. Reusing Shower and Bath Water | Language Natural Sciences Technology |
|  2. The Buzz on Honey Bee Economics | Language Natural Sciences Social Sciences Technology Economics & Management Sciences |
|  3. Have you Sequestered your Carbon? | Language Natural Sciences Technology Mathematics |
|  4. Did you Grow your Greens? | Language Natural Sciences Social Sciences Life Orientation Arts & Culture |
|  5. Clearing Invasive Weeds | Language Natural Sciences Technology |
|  6. The Secret of a Spring | Language Natural Sciences Social Sciences Life Orientation Technology Mathematics |
|  7. The Secret of the Disappearing River | Language Life Orientation Social Sciences Economics & Management Sciences |
|  8. Creative Garden Design | Language Natural Sciences Technology |
|  9. Recycling, Waste Reduction and Creative Re-use | Language Social Sciences Life Orientation Arts & Culture Technology Economics & Management Sciences |
|  10. Worming Waste | Language Natural Sciences Technology |
|  11. Growing Mother-tree Seedlings | Language Natural Sciences Technology |
|  12. Rooibos: a Biodiversity Economy at Risk | Language Natural Sciences Economics & Management Sciences |

Many more Handprint resource books are in the planning stages. These resource books and many others for teacher educators and teachers are available electronically in pdf format on www.tessafrika.net. The Handprint resource books can also be downloaded from www.handsforchange.org.

The adaptive use of these resource books for educational purposes is encouraged. Anyone wishing to develop their own resource or adapt one, can contact Share-Net sharenet@wessa.co.za for a version in Microsoft Word.



HAND PRINT™
action towards
sustainability

This handprint is of a 10-year-old girl, Srija, from a school in Hyderabad, India, who was involved in a project taking action for sustainability. Her handprint can be taken as a symbol for positive action.

Increase your handprint. Decrease your footprint.

Human impact on the Earth has tripled since 1961 and our human footprint is now 25% bigger than the planet can support. In other words we are using 25% more natural resources and services than the planet can create and provide. The 'Ecological Footprint' is one way to measure what area of land and water the whole human population requires to produce the resources it consumes and to absorb its wastes, and we now need 25% more area than is available on the whole planet. This means that the planet is simply being damaged beyond what it can repair, and this cannot continue without causing very serious threats to all life, including our own.

Education is a key way to achieve the changes we need to live in a manner that the planet can support. Environment and Sustainability Education (an environmentally focussed approach to Education for Sustainable Development – ESD) is a move away from seeing education just as a means of producing the skills to carry on doing what we are doing. It develops the abilities needed to address the big issues affecting the planet, and builds the capacity in communities to make important decisions about their future. Environment and Sustainability Education calls for action.

The Handprint is one measure of Environment and Sustainability Education action. The idea is to decrease the human footprint and to make the world more sustainable. The Handprint is a new approach or 'tool' being developed by the Centre for Environment Education (CEE), in Ahmedabad India, with many partners across the globe. The purpose of the Handprint is to help measure **positive action for change** at different levels. We all need to decide **what we can do** at the individual, community, national and global level in order to increase our Handprint, and decrease our Footprint.

“Through our actions, we add substance and vigour to the quest for sustainable living.”

The Ahmedabad Declaration 2007: A Call to Action, 4th International Conference for Environmental Education

