ESSENTIAL AMATHOLE:
A CASE STUDY OF UNLOCKING GREEN JOBS IN THE BIOPROSPECTING SECTOR

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Trade & Industrial Policy Strategies (TIPS) is a research organisation that facilitates policy development and dialogue across three focus areas: trade and industrial policy, inequality and economic inclusion, and sustainable growth

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ABOUT THIS PUBLICATION

This document summarises the findings of a two-year initiative and collaboration on *Unlocking Green Jobs: A Catalytic Intervention* between the World Wide Fund for Nature, South Africa (WWF-SA) and Trade & Industrial Policy Strategies (TIPS).

It is complemented by a Synthesis Report and two other case studies on:

- Protecting and Unlocking Jobs Through Water Stewardship: A Case Study Linked to the Umbogintwini Industrial Complex, eThekwini; and
- Unlocking and Retaining Jobs in the Alien Vegetation Added Value Chain through Industrial Symbiosis: Case Study on Wood Pellets.

The synthesis report and the case studies are based on work by and inputs from numerous individuals, including:

- A Project Steering Committee, including Glenda Raven (WWF-SA); Gaylor Montmasson-Clair (TIPS); Eureta Rosenberg (Rhodes University, Environmental Learning Research Centre), and Olivier Grandvoinet (Agence Française de Développement [AFD]);
- A Working Team, including Thabo Thulare (TIPS/GreenCape); Daryl McLean (Rhodes University, Environmental Learning Research Centre); Shakespear Mudombi (TIPS); Mike Ward (Creating Sustainable Value); and Nicola Jenkin (Pinpoint Sustainability); and
- A group of experts who kindly reviewed the case studies and participants at various research sites, and gave their time and information to assist in developing the case studies.

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EXECUTIVE SUMMARY

A series of policy studies has argued that the green economy can create large numbers of jobs, while simultaneously addressing environmental challenges and alleviating poverty; yet this vision has not materialised. The Essential Amathole (EA) case study aims to provide illustrative snapshots across the green economy, as an input into social dialogues to establish the partnerships needed to take forward the vision.

The case study focuses on the Bioprospecting Strategy, one of two components in the National Biodiversity Economy Strategy. The Bioprospecting Strategy aims to grow the industry by 10% a year, off a 2014 baseline of R1.5 billion. The number of jobs to be created is not described in the strategy itself, but the aggregate target for the Biodiversity Economy is 300 000 jobs. This case study research has provided a quantitative modelling that allows more precise estimation of the total number of hectares that would need to be cleared of Invasive Alien Plants (IAPs) and planted, harvested and beneficiated through the extraction of essential oils (a highly profitable and labour intensive strategy) to create these jobs.

Essential Amathole (EA) provided the site for primary data collection. EA represents a partnership between the state; private sector; rural communities in the Amathole district; and staff and students at the University of Fort Hare. The private sector acts as a hub, with centralised capabilities for cultivating and supplying seedstock; distillation; retail; and administration, management and marketing of essential oils. The private sector partner also grows their own crops, leasing land from the university, a local agricultural college and the state. The community participates through cooperative "outgrower" relationships, using private or communal land. The university provides testing and monitoring of soil, crops and other key production factors. The project has to date cleared 40ha of IAPs. It has restored the land through composting, and planted, harvested, distilled; and sold essential oil. Other than as outgrowers, the community owns 25% shares in EA, as the community benefit-sharing component. A total of 68 different community groups registered as potential beneficiaries, including old age homes; gospel groups; youth sports clubs; and cooperatives wanting to play an extended role in the project as opportunities open up.

However, the project went into hibernation just as it was beginning to reach sustainability. This was due to an unfortunate confluence of factors.

The time taken to build community involvement initially drew project resources away from production, and the time taken to restore land before planting also slowed things down. The Minister of Agriculture, Forestry and Fisheries, in response to protests nationally, issued a determination raising the minimum wage for agricultural workers substantially higher than the contracted project budgets. Project reports were submitted by the project but allegedly not forwarded by the state to the donor, and this resulted in project funding being cut off. Traders in the market sensed vulnerability and reportedly used this to bargain down prices.

The project has achieved some significant gains. Central capabilities have been built; partnerships have been established; skills have been developed; hectares have been cleared and planted; a brand has been established; and the project retains some capacity and momentum. They are in the final stages of negotiating a new contract with the provincial Department of Rural Development and Agriculture

However, important lessons from the case study may help avoid similar meltdowns in other projects, and could also inform a review of the bioprospecting strategy (and implementation modalities) to take forward the job growth, social development and environmental restoration agenda. EA appears to be typical of many essential oil projects that have stalled or collapsed around the country. The case study proposes a set of possible recommendations for re-igniting these; rolling out the bioprospecting strategy more widely (in both the development and private sector contexts); and improving the bioprospecting strategy as a whole.

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ABBREVIATIONS

ABS	Access and Benefit Sharing
ACT	Amathole Community Trust
AFD	Agence Française de Développement
BABS	Bioprospecting, Access and Benefit Sharing (Regulations of 2008)
BBBEE	Broad-Based Black Economic Empowerment
BES	Biodiversity Economy Strategy
CBD	Convention on Biological Diversity
CBI	Centre for the Promotion of Imports
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPPP	Community-Public-Private Partnership
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
EA	Essential Amathole
IAP	Invasive Alien Plant
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
TIPS	Trade & Industrial Policy Strategies
TOPS	Threatened or Protected Species regulations
WWF-SA	World Wide Fund for Nature, South Africa

1. INTRODUCTION

A series of policy studies has argued that the green economy has the potential to create large numbers of jobs while simultaneously addressing social and environmental challenges. Yet state interventions to take forward such strategies have consistently run into problems. The goal of the project is to identify what is working and what is not; why; and who needs to do what to achieve the policy vision. The research findings will inform social dialogues between stakeholders, aimed at establishing new partnerships to carry forward the mission.

This case study of the essential oils industry is one of four case studies that provide illustrative snapshots across a value chain in the green economy. The first case study highlights the centrality of water to the society, economy and environment; and argues for water stewardship in creating new jobs and saving existing jobs. One part of the water stewardship strategy is clearing Invasive Alien Plants (IAPs). The second case study therefore interrogates and remakes the business case for the beneficiation of the biomass from IAPs along a diversified value chain. One element of a diverse value chain is using the biomass to produce wood pellets. These pellets areused as an alternative energy source for lighting and heating in poor households, thereby substantially reducing the cause of fires in informal settlements and 40 000 cases of chemical pneumonia a year. This (the third) case study illustrates how the land cleared can be restored and utilised for the production of essential oils (or other agricultural and food security purposes), while simultaneously creating jobs, alleviating poverty and building social cohesion. The fourth case study demonstrates the small business development potential in the development and diffusion of energy and water efficient technologies, using business incubators, in support of the water stewardship strategies. The other case studies – as well as the wider framing of the project – are more fully described in the Synthesis Report.

These case studies are intended to provide "mirror data" for purposes of stakeholder engagement in social dialogues, and do not claim to represent definitive positions.

2. THE SOUTH AFRICAN BIOPROSPECTING STRATEGY

2.1 Regulatory Framework for the South African Bioprospecting Strategy

In 2015, the National Department of Environmental Affairs (DEA) gazetted the South African Biodiversity Economy Strategy (BES). This is only one of a complex matrix of legal, regulatory and policy frameworks that affect the bioprospecting industry in South Africa. Others include:

- The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA or Biodiversity Act);
- The 2013 Bioeconomy Strategy issued by the Department of Science and Technology;
- The Bioprospecting, Access and Benefit Sharing (BABS) Regulations of 2008;
- Ratified international agreements relating to biodiversity which are binding on the Republic, such as the Convention on Biological Diversity (CBD); and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization (in short referred to as "the Nagoya Protocol on ABS");
- The Threatened or Protected Species (TOPS) Regulations, CITES Regulations;
- The National Biodiversity Framework;
- The Provincial Ordinances;
- The Patents Amendment Act, 2005;
- The Indigenous Knowledge System Policy; and
- Various norms and standards for biodiversity management.

This maze of global, regional, national and sectoral regulations is not fully coherent.

Evidence from this case study as well as research more widely supports the argument (acknowledged in BES) for improved policy coordination, streamlining the systems; and building state capabilities to more effectively provide the enabling environment needed to achieve policy objectives.

2.2 The South African Bioprospecting Strategy

The National Biodiversity Economy Strategy (BES) describes two strategy components, for bioprospecting and the wildlife economy respectively. In relation to bioprospecting, BES describes the sector as encompassing:

"organisations and people that are searching for, collecting, harvesting and extracting living or dead indigenous species, or derivatives, and genetic material thereof for commercial or industrial purposes" (DEA 2015: 10).

The goals are to

"to contribute to the transformation of the biodiversity economy in South Africa through inclusive economic opportunities, reflected by a sector which is equitable – equitable access to resources, equitable and fair processes and procedures and equitable in distribution of resources (i.e. business, human, financial, indigenous species, land, water) in the market". (DEA 2015: 10).

The strategy notes that the bioprospecting industry has grown at an annualised rate of 6% over the past decade.

Market segmentation of value-added products in 2013 fell into five product categories.

- Personal hygiene products (R620 million or 40% of products);
- Cosmetics (R590 million or 38% of products);
- Complementary medicines (R170 million or 11% of products);
- Food flavourings (R120 million or 8% of products); and
- Oils (R50 million or 3% of products)

BES describes two growth scenarios, using the 2013 baseline of R1.5 billion as the point of departure. The "Business as Usual" scenario projects continued growth at the domestic historical rate of 6% a year. A High Growth scenario is based on the international growth rate of 20% in bioprospecting. The BES target is set between these, at 10%.

Figure 1: Growth projections across two scenarios

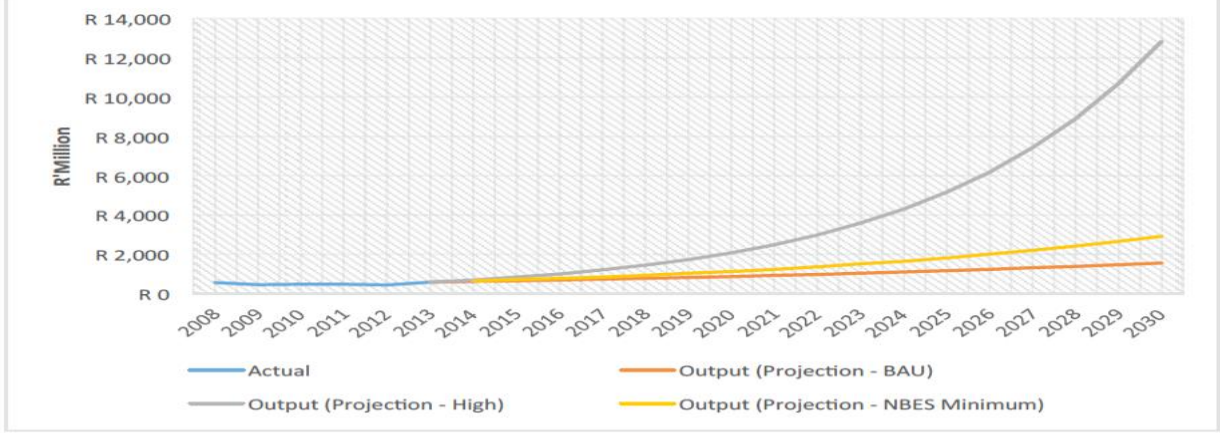


Figure 2: *Possible futures for the biotrade market size as measured by output in the biotrade market segment. In the BAU (business as usual) scenario growth continues at 6% per year, following the trend of the past 14 years. In the most optimistic High scenario, an annualised growth of 20% per year is achieved as in international markets over the past 14 years. A minimum BES goal of an annualised growth of 10% per year would move the sector into a targeted growth situation.*

Source: DEA 2015: 17

The strategy does not provide indications of the potential number of jobs to be created in bioprospecting. BES does however note that the jobs to be created will contribute to achieving the targets of the Green Jobs Accord, which aimed to generate 300 000 jobs in the green economy by 2030.

BES details a list of Strengths, Weaknesses, Opportunities and Threats identified through a consultative process, most of which were confirmed during this case study research. It also details a set of 10 Transformative Enabling Interventions (each of which has enabling actions, with lead agents allocated responsibilities for undertaking these). The 10 Transformative Enabling Interventions are:

- Streamline the regulatory environment;
- Optimise supporting institutional arrangements;
- Enhance skills, education and capacity;
- Facilitate know-how, technology exchange and innovation;
- Improve access to finance and raise levels of investment;
- Increase net exports and raise access to markets;
- Promote participation and awareness;
- Enhance research and development;
- Transform the industry; and
- Advocate the value of bioprospecting.

There has been some progress against many of the BES action items; and little or no movement against others. However, this case study takes place in the context of 3 years implementation of the strategy, and provides early evidence regarding what impact the strategy is having on the ground, as well as emerging challenges and possible "adaptive management" responses.

2.3 Greening the analysis of the Bioprospecting Value Chain

BES describes the bioprospecting value chain as including three segments. These are the resource segment (where growing and harvesting take place); the biotrade segment (who buy and sell the resources); and the final market segment (where materials are beneficiated and/or used).

The green economy modelling work led by the Rhodes University Green Skills program has suggested that *extending* value chain analysis is central to achieving circular production systems and articulating micro- and macro-rationalities. The linear value chain described by BES does not reflect considerations such as water usage, soil degradation, the impact on human well-being or cradle-to-cradle production concerns; nor does it reflect the upstream, downstream, sideways or lateral value chain linkages. There are both environmental and employment effects that have therefore not yet been fully elaborated in BES. Additionally, the green economy represents an area of latent economic potential, in which past trends may not be the best predictive foundation for future growth. Anticipatory methods common in green economic thinking may also provide a useful elaboration of existing BES analysis – for example, it may be possible to increase the 10% target if certain policy levers are established.

The BES could be improved through more extensive use of the core concepts in green economics. The primary research site for this case study (Essential Amathole) models some of this at local level; could be extrapolated to other local contexts; and (less reliably) aggregated to provincial and national job creation estimates in the agro-ecological zones BES identifies.

2.4 Locating industrial strategy within analysis of the landscape and regime

The 10 Transformative Enabling Interventions in BES were developed through stakeholder consultation, and, this case study suggests, provide extremely useful starting points. However, the targets are based on an average of national and global historical growth rates. What is missing, and what it is within TIP's mandate to provide, is a more nuanced economic analysis of structural economic conditions at regime and landscape level; and the economic policy instruments needed – and in some cases, already available – to achieve such growth. The example of the cosmetics industry below illustrates that some research already exists to undertake such analyses; some specialised research capabilities exist to take them further; and that such analyses provide useful pointers toward a more precise industrial strategy.

Box 1: The Use of Natural Ingredients in the Cosmetics Industry

Personal care products represent a global market estimated at US$426 billion. Global sales of the "natural cosmetics" segment in 2011 comprised about US$26.3 billion (roughly 6%), but has seen strong growth off a 1996 base of only US$1.4 billion. The US and Europe represent 40% of the market, but sales have been sluggish here since 2009. Asia represents about 37%, and rising income levels in both Asia and Brazil have contributed to stronger growth in these areas over the past decade.

The top 10 companies hold 50% of the market, which is otherwise highly fragmented (only 3 brands have 3% or more of market share). There is a very high predominance of Small and Medium Enterprises (SMEs). In Europe, for example, two thirds of the 4 000 cosmetics companies are SMEs.

Marketing is a primary purpose of including natural ingredients in cosmetics. Sometimes called "fairy-dust" by industry insiders, the inclusion of natural ingredients into the product – often with the origins and story of the natural ingredient – promotes a "feel-good" factor. Over 80% of the 20 largest cosmetics companies mention biodiversity in their annual reports, and 75% claim to track the impact of their supply-chain on biodiversity.

The raw materials are sourced through the same supply chains as for food and botanicals, with many of the same intermediaries. Local dealers source material from growers or collectors; it is traded; and stored in large warehouses by international trading companies who play an important role in quality control, pricing and availability. Almost all the high-volume trade species are commercially grown because this is cheaper; easier to control quality; and easier to monitor social and environmental impacts. Wild harvesting occurs mainly when it is cheaper; when the wild product yields a higher level of the bio-active ingredient; or when the plant has not yet been developed for commercial cultivation.

Research and Development (R/D) on new ingredients is sometimes handled internally, but most often is outsourced to intermediary companies or conducted by intermediaries and "sold on". There is enormous pressure to innovate: new brands are now launched every six months instead of every two years. The sector therefore spends $9 billion on R/D annually. Patterns of R/D range from simple extraction and use, through biorefinery of essential oil, to molecular modelling and other advanced techniques. Patents of natural product innovations represent 49% of all cosmetics patents (although these are often small incremental innovations).

The Nagoya Protocol and regional/national frameworks have brought some clarity to ABS. A set of standards and certification systems for social and environmental concerns has been developed for the industry, regulating aspects as diverse as ABS, ethical sourcing, quality, and corporate governance. These are increasingly being built into the contractual relationships between buyers and suppliers, i.e. there is some devolution of accountability for compliance.

There are, however, still unclarities in ABS. Since even a single case of litigation may substantially impact on the feel-good factor of a brand or company more widely, there is both interest in and hesitation around ABS and therefore use of natural ingredients.

Based on Wynberg, R and Laird, S (2013)

Essential oils are used mainly in the food and beverage, pharmaceutical, and cosmetics industries. There are both similarities and differences across these industries. However, the case of the cosmetics industry above illustrates some important regime and landscape considerations that apply across all three:

- SA has legal rights to an extraordinary range of genetic resources with massive commercial potential. Excellent scientific research capabilities to investigate these also exist domestically. Such capabilities have their own growth potential as the "intermediary" R/D capabilities used by global industry players. They have already developed baseline scientific knowledge, but a more precise economic analysis is needed to translate this platform into industrial strategy to springboard domestic growth and employment.
- Domestic and regional markets are probably too small to build the supply-side capabilities needed to springboard global market entry for SA companies. The global landscape is dominated by powerful actors operating through established and manifestly exploitative supply chains (in which profits lie mainly in downstream processes from cultivation or harvesting). A considered industrial strategy would need to engage these political-economic dynamics tactically. For example, some downstream process capabilities could be developed or improved in South Africa; investments in quality control would strengthen domestic bargaining capacity; active development of export markets may assist in by-passing biotraders; and streamlining the management of ABS could incentivise global players who are currently hesitant.
- The state holds significant power to affect these factors. As noted in relation to the pharmaceuticals industry "...*in the alignment of actors and actants, the South African state still holds a hegemonic position and is drawn between the revitalisation of TM [traditional medicine} as part of an identity politics that makes up for the impudence toward local knowledge in the past, on the one hand, and the interest in marketable culture on the other*" (Reihling 2008: 27). However, this would require a more developed industrial strategy, policy coordination, smart management, targeted state capability building and collaboration with industry players to achieve.
- Important policy choices face the state with regard to the overall development paradigm. BES clearly provides for both private sector and community participation (and there is a potential win-win relationship between the two constituencies). However, this case study illustrates that a developmental approach to implementing the bioprospecting strategy is as viable as the more established commercial approach but may require some policy review to enable.

3. ESSENTIAL AMATHOLE – A BIOPROSPECTING CASE STUDY

The primary research site selected to explore obstacles to achieving the growth potential of the bioprospecting strategy is Essential Amathole, a project based in the Amathole district of the Eastern Cape. It was selected partly to ensure better regional spread across the four *Unlocking Green Jobs* case studies, but partly also because the project is an innovative collaboration between a university (Fort Hare), the private sector (Essential Amathole), local communities (through the Amathole Community Trust and the participating cooperatives and other outgrowers) and the state.

The project is, in this sense, a paradigmatic example of the quadruple helix model to achieve win-win solutions within a sustainable development framework. It also usefully exemplifies the more developmental approaches to implementing BES, in contrast to the better represented commercial farming options.

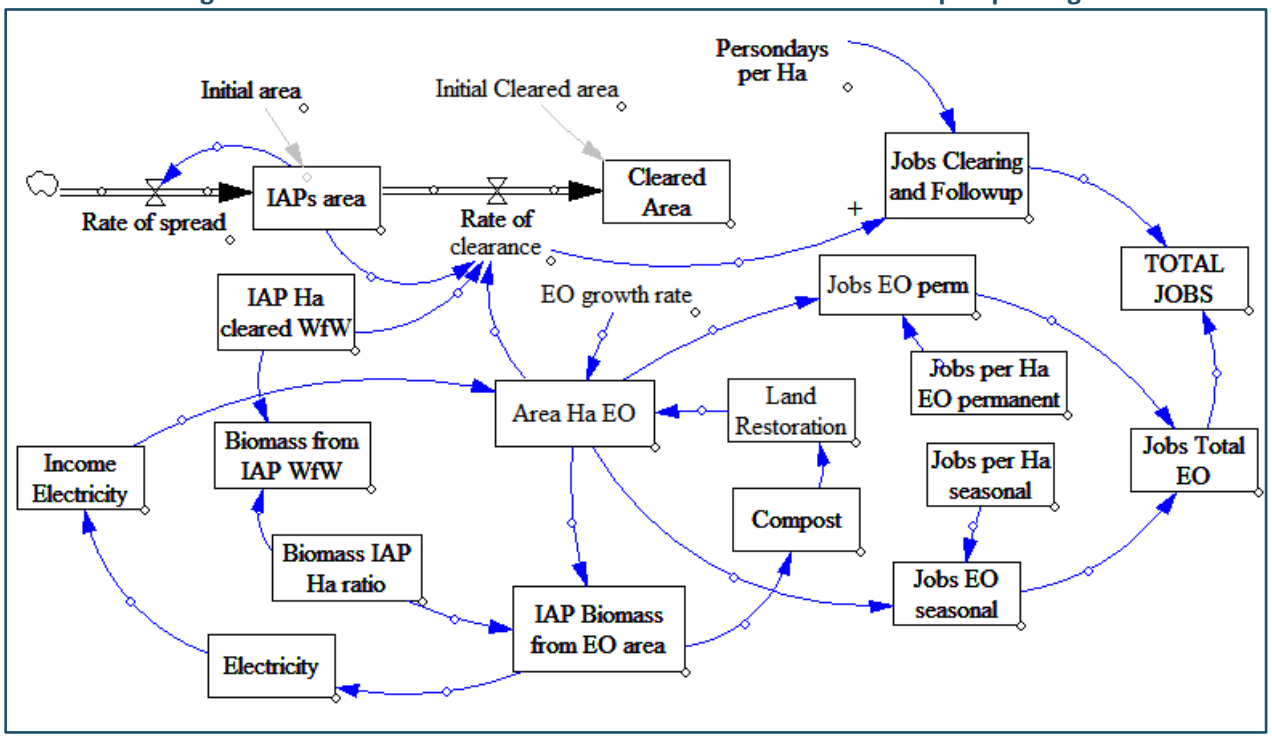
While it ideally exemplifies the ABS (community benefit sharing) component, it is not exclusively a bioprospecting initiative – most of the essential oils produced are not from indigenous plants. However, some are; and the project therefore holds a bioprospecting permit from DEA. The project also shares the bioprospecting value chain, but has extended this value chain in ways that helpfully illustrate how to do so in implementing BES within a green economy framework.

Sometimes the project uses available land that does not need to be cleared of invasive alien vegetation or restored; sometimes the land does not need clearing but does need restoration; sometimes it needs both clearing and restoration.

The alien vegetation is sometimes used to create compost for land restoration; sometimes it is used as fuel for the furnace that powers the distillery (where the savings on energy subsidize the work of clearing, i.e there is job creation potential in the extended value chain). Twenty-five percent of profits from the project are allocated to the Amathole Essential Trust, which has registered beneficiaries ranging from old age homes, sports clubs and cooperatives, including some that need start-up capital to participate in EA. Thus the expanded value chain has circularities in economic, environmental and financial flows, and these represent job creation potential not modelled in BES.

The Vensim Diagram below was modelled on data provided by Essential Amathole. With some refinements to the data sets behind the model and some localisation of data, the model can be used to extrapolate quantitative estimates for job creation and the impact on environment within developmental approaches to BES implementation (nationally, provincially or within agro-ecological zones).

Figure 2: The Essential Amathole Extended Value Chain for Bioprospecting



Source: Authors

After an enthusiastic start-up phase of trial and pilot, Essential Amathole went into "hibernation" just as it should have been scaling up to full production.

The challenges they describe are also recounted by similar essential oils and bioprospecting projects across the country. This report aims to document these for consideration in how best to take BES forward.

We start our analysis here by putting the "beneficiary" stories first, before proceeding to describe what has taken place at project level, and the regime and landscape factors undermining success.

4. ESSENTIAL AMATHOLE – THE BENEFICIARIES' VOICE

4.1 Mrs Fihla's story

Zimkitha Fihla is the leader of a group of six cooperative farmers participating in the Essential Amathole project, which is aimed at enabling poor rural communities in the Amathole District to enhance their economic and livelihood opportunities on the basis of capitalising on their existing assets (e.g. land, labour, skills and entrepreneurial spirit) through direct and indirect participation in a sustainable and profitable agricultural enterprise, and in so doing, improve the general socio-economic conditions of the area.

Mrs Fihla relates her experience of the project with a moving mix of hope and heartache. Recounting their bare-handed battle with bramble infestation to clear the 2ha plot granted by the farm owners, she says that if only they had the right equipment life would be so much easier. It has taken them two years to clear and maintain a hectare, which a tractor could have done in two days. They have to carry water almost a kilometre to water their crop, when irrigation or drip feed technology would free up time to concentrate on planting and harvesting. The composting capabilities being incubated by the project had not yet reached Mrs Fihla's co-op at the point the project went into hibernation, so instead they collect manure from a farm outside Hogsback; but have to hire a vehicle to deliver it each time.

Having combined their meagre savings in a *stokvel* to purchase the seedlings, they have a material interest in the project. But more striking is the investment of hope. After two years of work, they hope to earn “at least” R10 000 each for their crop, the raw essential oil from which will retail for close to R500 000 at the point at which beneficiation begins. Mrs Fihla says her vision is to use her earnings to buy a few pigs and goats for her home in the Tyhume Valley village. This will provide a second business stream while she continues to grow and harvest the essential oils.

It is a modest and realistic plan for digging their way out of poverty, yet the project being in hibernation has sabotaged them. Mrs Fihla says her biggest challenge currently is keeping the team motivated, which she does through weekly meetings between the co-op members.

Leaving the farm, a dilapidated structure with a “Garden of Hope” sign attached can be found. Asked about the gardening project, Mrs Fihla says it was another project a few years ago, but “on this one we were defeated”. It is testimony to their sense of being “perpetual beneficiaries”.

4.2 Other beneficiary stories

The key themes in Mrs Fihla's story are common across many of the people we interviewed, with variations. One respondent – a motivated and energetic young man who represents his village on the Amathole Community Trust – spent a year setting up a brush-cutting and clearing co-op with a small group of friends. They actively participated in the project at all levels to understand the opportunity; developed a co-op constitution; spent money opening a bank account and registering the co-op; developed the skills; wrote and rewrote a funding proposal; and negotiated with ASPIRE (a provincial development funding agency) to buy a tractor that would make the co-op commercially viable. Ultimately ASPIRE informed them the funds had been allocated elsewhere. ASPIRE has now collapsed, with criminal investigations of former management for fraud and corruption. For this respondent also, the hope and heartache is taking its toll. Some co-op members have now withdrawn; all the legal documentation needs to be updated; the bank account has been closed due to non-activity; and it will take motivation, time and money to get things going again.

Another respondent entered the project as a general worker, and has progressed over the years to become farm manager. He is sanguine about the challenges. He says coops are very tricky. He has found that when they go beyond five participants, they become almost impossible to manage. Even with five people, it takes a long-range commitment, and selecting the right kind of partners.

The local agricultural college takes us to see the lands Essential Amathole hires from them to grow crops. There is no shortage of land or water here; but the crops are not being maintained, and only occasionally harvested, due to the project being in hibernation.

5. ESSENTIAL AMATHOLE – THE PROJECT VOICE

5.1 Project description

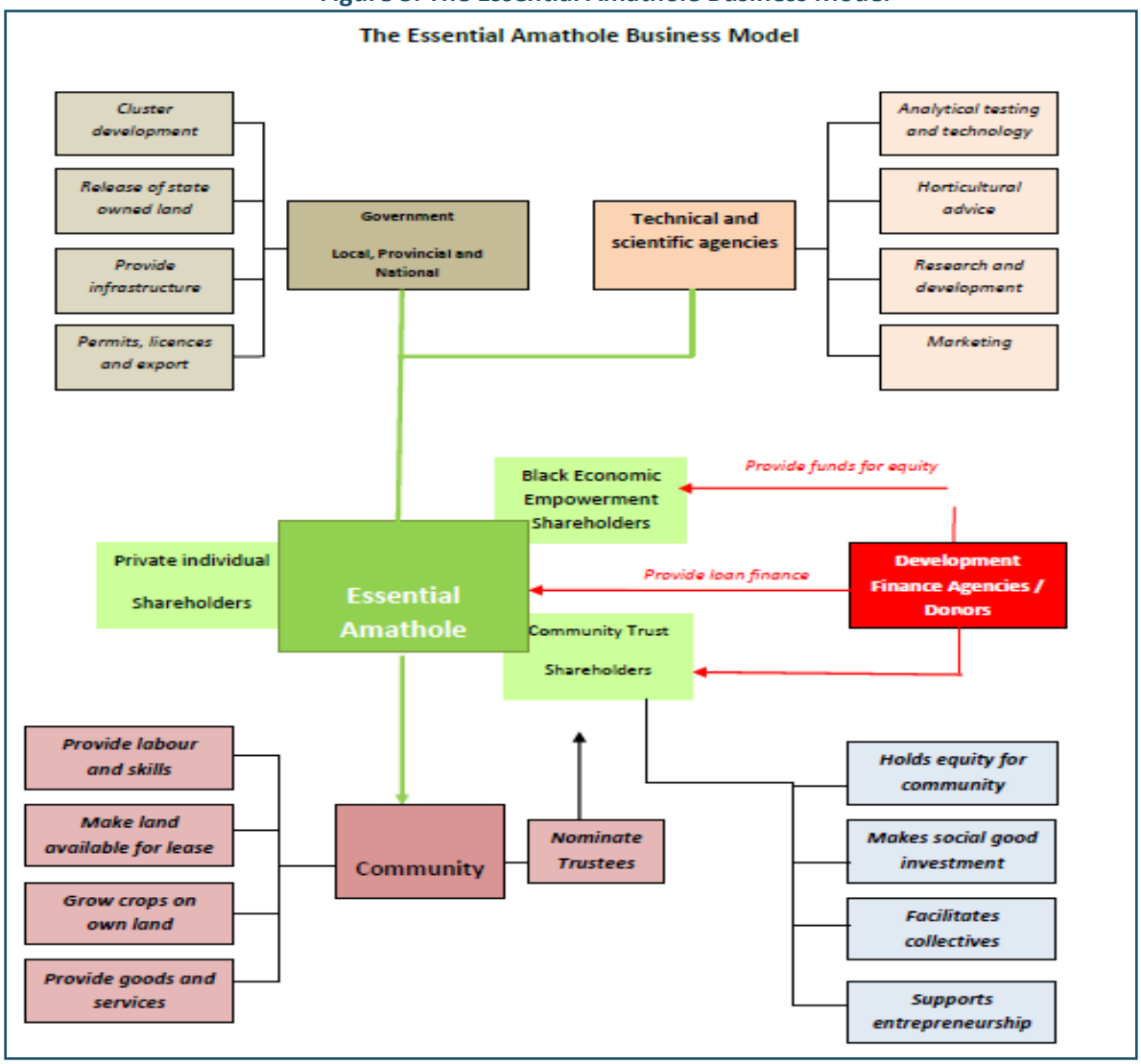
Essential Amathole (Pty) Ltd is an essential oils-producing business located in the Amathole District in the Province of the Eastern Cape. The core business of Essential Amathole is to propagate, cultivate and distil high-quality certified organic and natural essential oils and value added products for the local, national and international market.

In carrying out its core business, Essential Amathole aims to increase the economic and livelihood opportunities for communities in the rural areas in which the business operates by enabling them to capitalise on their existing assets (e.g. land, labour, skills and entrepreneurial spirit) through direct and indirect participation in a viable and profitable primary agricultural and agro-processing enterprise, and in doing so, improve the general socio-economic conditions of the area.

The business model of Essential Amathole is based on an innovative community-public-private partnership (CPPP). The Amathole Community Trust (ACT) is the formal structure through which community interests are represented within Essential Amathole. It is this unique partnership arrangement that can in many ways address the flaws and capacity constraints of previous rural development initiatives. The private individuals and farmers who are invested in the project aim to ensure that commercial principles inform decision-making in the project, and that it is run along business lines. At the same time, the communities bring their land, knowledge, labour and services as key assets into the business, and derive benefits in terms of employment, outgrower arrangements, land leases and contracts for the provision of goods and services that the project needs, and profit-sharing. ACT, as a major shareholder of Essential Amathole, is constituted to distribute its share of dividends (25%) for social good investment in the participating communities to bring about meaningful change.

The business model brings together a range of players in diverse roles, as illustrated in Figure 3.

Figure 3: The Essential Amathole Business Model



Source: Essential Amathole Project Proposal 2017 – 2021: 5

5.2 Project history

Essential Amathole was conceptualised in a discussion in 2007 between eight people who met to discuss what could be done to address poverty and unemployment in the region. These included a professor from Fort Hare whose research specialisation is essential oils and whose interest in essential oils dates from his prior employment in a pharmaceutical company. Another is the local traditional leader. Others include former senior government officials (including the former DG of DEA and a former DG in the Office of the Premier of the Eastern Cape) as well as retired trade unionists.

A company was established. A technical analysis, market analysis, and business feasibility study were developed as part of the fund-raising application submitted to the Department of Trade and Industry (the

dti) in 2007. International donor funding was secured, to be administered by Treasury but managed through a project implementation structure in DEA.

The project invested a great deal of energy in the social development angle. Every participating village was visited to invite participation, including representation on the board.

Training and support was provided for 68 cooperatives. Some of these were responsible for core business activities of growing and harvesting. Others were support interventions, such as brush-cutting and clearing services, and composting. With the announcement of the Amathole Community Trust, communities were also invited to register as potential trust beneficiaries. More than 100 organisations registered, including old age homes, gospel groups and youth sports clubs.

One respondent argued that too many resources were spent on the social development side, and that this diverted resources away from product development and sales, which would have made the project less vulnerable when the funding challenges arose. An impact assessment of the social development achievements has not been conducted, but some of the information for measuring the social development component of a multi-criterion analysis does exist in project reports.

Essential Amathole began cultivating seedlings and distributing or selling these to the outgrowers. Project management reported that they had to spend a great deal of time also in restoring the soil, in many cases badly denuded. The composting business stream originated partly also in this concern.

The University of Fort Hare played a central role in testing the suitability of crop species, monitoring soil and plant diseases, and other scientific and technical work. There are currently seven masters and PhD students focused on this work, but there have been equivalent cohorts annually throughout the project lifespan.

Another component relevant to a multi-criterion analysis of the project is the impact on Higher Education Institution capabilities, and the employability of graduates, who are reportedly snapped up by various employers as a result of their involvement in Essential Amathole.

The university has produced a series of technical studies by Fort Hare University on the restoration of soil that was achieved during the project lifespan. These too are a relevant consideration in any multi-criteria analysis of the impact of the project.

Fort Cox Agricultural College played a role both in providing some land for crops, as well as in providing basic agricultural training to participants.

Other training was provided by a local technical agency. As we arrived to conduct a site visit, the local TVET college (Lovedale College) was leaving Essential Amathole after discussing a potential partnership. The Technical and Vocational Education and Training college had received funding from the Services Sector Education and Training Authority to establish an enterprise development wing, and were exploring the possibility of supporting the outgrowers through funded enterprise development learnerships and Small Medium and Micro Enterprise support. Again, the impact of college sector

responsiveness to local development initiatives should be taken into consideration in a multi-criterion analysis.

Much of the learning and teaching has been informal and on-the-job, however. In this respect also, we heard testimony of increased levels of collaboration and information sharing within and across villages.

Essential Amathole purchased some basic equipment, including a distillery and later a furnace to generate power by burning invasive alien species: the clearing and collection of this provides some jobs which are paid for through the energy savings. At this stage, the project had succeeded in establishing the infrastructure, setting up the contractual agreements, establishing the Trust, securing a bioprospecting permit, and establishing the quality systems and achieving organic certification.

The business scaled up from crop trial phase from 2007 to 2011 to a pilot phase in 2011/12. The main focus of activities following trials and piloting was the commercial expansion from 3ha to 40ha in 2013/2014 under cultivation with a diverse range of essential oil plant species.

The Company extracted high quality organically certified and natural essential oils successfully from its cultivated and wild-harvested plants through steam distillation. It brought forward the commencement of value adding activities in anticipation of engaging in full-scale commercial expansion. It has also commenced the sale of bulk oils to the international, national and local market, along with its range of natural, high quality, value added products

A confluence of several factors then contributed to a collapse. The most significant of these was the project management committee in the dti failed to submit the project reports to Treasury, which pulled the funding. Simultaneously, the Minister of Agriculture made a determination to increase the minimum wage for agricultural workers, which meant the project was inadequately funded and had to retrench.

The project entered “hibernation”, and for several years have been attempting to secure funding for a new phase. This phase is projected to create and in some cases sustain, 1 080 jobs (disaggregated as per Table 1).

Table 1: Production and Employment Projections in Essential Amathole

	2017	2018	2019	2020	2021	Total jobs over 5 years
Essential Amathole (Pty) Ltd (Ha)	40	68	96	132	132	
Job coefficient: Permanent jobs per hectarea		0.66	0.66	0.66	0.66	
Jobs coefficient: Seasonal jobs per hectarea	1	1	1	1	1	
Permanent jobs	39	45	63	87	87	**87**
Seasonal jobs	40	68	96	132	132	**468**
Total Essential Amathole jobs	**79**	**113**	**159**	**219**	**219**	**555**
Outgrowers (Ha)	0.5	45	80	120	168	
Jobs per hectare (Permanent)	0.66	0.66	0.66	0.66	0.66	
Jobs per hectare (Seasonal)	1	1	1	1	1	
Permanent jobs	0	30	53	79	111	**111**
Seasonal jobs	1	45	80	120	168	**414**
Total outgrower jobs	**1**	**75**	**133**	**199**	**279**	**524**
Total permanent jobs	**39**	**75**	**116**	**166**	**198**	**198**
Total seasonal jobs	**41**	**113**	**176**	**252**	**300**	**882**
Total jobs	**80**	**188**	**292**	**418**	**498**	**1080**
Total hectare	**40.5**	**113**	**176**	**252**	**300**	

Source: Essential Amathole Project Proposal 2017 – 2021: 5

The above figures from Essential Amathole have been used to develop a Vensim model of the number of jobs that can be created per hectare of land in the essential oils industry, using a developmental as opposed to commercial farming approach. The model is scalable, but may need input data to be refined for different contexts, and does not describe the job creation beyond the biorefinery phase of the value chain.

6. TRIANGULATION OF THE AMATHOLE ESSENTIAL DATA

Subsequent to the Essential Amathole fieldwork, the research team conducted follow-up interviews and discussions with other players in the Essential Oils industry in the province and nationally. These included:

- Other "developmental" projects in the Essential Oils/bioprospecting industry;
- Private sector farmers of essential oils;
- The South African Essential Oils Producer Association;
- Researchers in the bioprospecting economy space;
- The provincial Department of Economic Development, Environmental Affairs and Tourism, and the Office of the Premier of the Eastern Cape;
- Support agencies and intermediary agents in the bioprospecting industry.

We also analysed other documents and information sent to us by respondents/discussants.

The core themes identified by the Essential Amathole site visit were either confirmed or elaborated through this further research. However, engagement with private sector participants in particular sharpened the business perspectives, which nevertheless shared strong similarities with the developmental projects such as Essential Amathole.

7. KEY RECOMMENDATIONS

7.1 "Green" the research, planning and monitoring/evaluation/reporting methodologies

The Bioprospecting Economy Strategy is based on an extrapolation of future growth potential from past trends. This is a traditional, albeit very limited, economic analysis. Growth anticipation for areas of "latent" economic potential such as the green economy can be strengthened through other methods. Policy instruments can unlock growth beyond historical trends, even using traditional economic concepts such as "induced demand".

A conventional economic approach to implementation planning would be to conduct a cost-benefit analysis of the isolated value chain provided in BES. "Green" economic thinking reframes the economy more widely; expands and circularises value chains; uses multi-criteria analysis rather than cost-benefit analysis; and prioritises stakeholder interests more widely than shareholder interests (e.g. wellbeing beyond profits). The Essential Amathole case provides baseline data to model BES implementation along these lines, with substantial implications for policy planning, budgeting, management and monitoring/evaluation/reporting. For example, the circularities being achieved in Essential Amathole, through the role of cooperatives in clearing alien invasive plants, producing energy from biomass, composting and land restoration, allow a wider modelling of job creation, a broader spectrum of impact from the economic to the environmental and social domains, and a deeper transformative transitioning of the SA economy.

Strengthen the analysis informing BES targets using the concept of "latent demand". Extend the BES value chain analysis using a multi-criteria analysis to elaborate BES for implementation purposes. Structure the BES monitoring and evaluation framework using green economy principles. Further elaborate then use the Vensim model to generate employment estimates for BES implementation nationally, provincially and in the agro-ecological zones already identified.

7.2 Conduct a "green" economic analysis and align the policy instruments needed to achieve BES targets

BES details excellent interventions to take forward the sector, but these could be strengthened from an economic development perspective through the kinds of detailed economic analyses that normally inform industrial strategy. The cosmetics industry case summarised in this report illustrates in a skeletal way how a preferably green but even traditional economic analysis of structural economic conditions, global and domestic landscape factors and value chains could helpfully shape a more nuanced strategic and tactical perspective.

It is within the TIPS mandate to undertake such analyses, and within the dti's mandate to support them.

Many of the economic development policy instruments and capabilities needed already exist in South Africa. Capitalisation schemes and export development schemes already exist under the dti. Small business development funding and support is available through the Department of Small Business Development,

the National Youth Development Agency and others. Skills development funding for enterprise development and co-op development already exists, even in the Amathole district.

TIPS should undertake the economic analysis needed to elaborate an industrial strategy for BES. Existing policy instruments should be coordinated behind the strategy by the dti and DEA, and (where necessary) new policy instruments put in place.

7.3 Provide long-range policy and strategy stability

The agricultural sector generally plans and works with long-term time horizons. Essential Amathole and private sector players plan for 10 years. However, government partners are often subjected to the phenomena of 'termism', where a five-year political term is taken as the planning horizon, and often the first and last year of these terms are not productive due to start-up or political uncertainty. Therefore, when these two organisational types collaborate the difference in organisational time becomes an axis of tension.

The National Development Plan aims to provide long-term policy and strategy stability, to address this very concern. BES should do the same.

7.4 Stabilise the political-administrative and administrative-project interfaces

At the start of Essential Amathole the then-MEC was a patron of the project. Others have come and gone within the first phase of the project, resulting in varying degrees of political commitment and subsequent support.

Business needs stability to thrive, and co-operative ventures are no different. The truth within this is borne out in the interviews and review of Essential Amathole. Not only has the nature of state organisations affected its progress but so have party-political shifts. For example, point-of-contact officials are deployed elsewhere, dismissed due to factionalism and/or promoted. This leads to constant lobbying and general uncertainty, which led one respondent to exclaim that "they keep changing, I promise you, go there now and it will be somebody different".

Another form of uncertainty was experienced by a co-operative which was granted R500 000 from ASPIRE for equipment. The funds were never transferred and no contingency measures could be assessed. What exactly happened to the funds is unclear, however the CEO, CFO and their attorney were arrested in May 2016 for fraud and corrupt activities, so it might become apparent what actually became of the funds. Whether the cooperative will ever derive any benefit from ASPIRE is unlikely.

The state should strongly enforce existing regulations regarding proper hand-over procedures. Both development sector and private sector projects should have Business Continuity Plans in place. Stabilising the political-administrative interface (already an NDP priority under Chapter 13) should be emphasised as a priority to new political or executive appointments for all actors in the bioprospecting space. Awareness of the anti-corruption strategies and channels for raising concerns should be embedded within project roll-outs.

7.5 Build and coordinate the state capabilities to implement BES

Bureaucratic inefficiencies, including the "silo" functioning of organs of state), were a primary factor driving Essential Amathole and other developmental bioprospecting projects into hibernation or collapse. They are also a primary constraint on private sector investment in the bioprospecting space, for example, in the delays responding to bioprospecting licence applications. There are systemic factors behind this, for example, unclarities in the ABS requirements or the scientific and technical questions behind what falls within the scope of ABS, which contributed to delays. The private sector and community groups have been patient in waiting for resolution of these (which are also recognised global system transition factors). However, it is incumbent upon the state to review the challenges and put in place the systems and organisational capabilities to respond to such factors more efficiently and effectively.

Many of the challenges confronting the state, private sector and community groups are new. In educational and organisational development theory, they require "learning what is not yet known". The method for dealing with this is known as "expansive learning": get system participants into the same room, to collectively "act now, start small, think big, learn fast". Reaching a shared vision and value base is key in the process.

The state should engage bioprospecting roleplayers to understand their experiences and constraints, and should "design back" from service delivery challenges to the organisational and individual capabilities needed to address these. An "expansive learning" strategy should shape the way forward. Role-players in the sector need some recourse where concerns can meaningfully be lodged and addressed, as an important "feedback loop" in the process.

7.6 Differentiate between developmental and commercial interventions

Developmental initiatives in the sector (such as Essential Amathole) are clearly distinct from commercial farming operations in several respects. They aim to capacitate socioeconomically marginalised groups to participate; the ABS component is handled within a wider social development framework; they do not have the infrastructure, capabilities or market access of commercial farmers; and they invest significant resources in weaving the social fabric necessary to project success. Such projects should be planned, funded, managed and monitored/evaluated/reported against different criteria from commercial farming. For example, the labour co-efficient used to estimate potential employment is not equivalent to commercial farming. They employ people to do the work that farmers use tractors and irrigation systems to do. Funding developmental projects against the same criteria as commercial farming will result in undermining the developmental agenda.

DEA, the Council for Scientific and Industrial Research and other key players should engage projects such as Essential Amathole in developing an appropriate set of criteria and processes for planning, funding, managing and monitoring/evaluating/reporting such interventions.

7.7 Articulate the wider regulatory framework to include a more developmental agenda

The state has imposed a minimum threshold of seven people to constitute a cooperative. The preference for larger numbers is understandable; however, none of the cooperatives in the Essential Amathole currently meet this criterion; and community respondents have argued that where co-ops include more than 5 – 6 "owners" they become less effective: smaller groups are more effective and lasting. Similar findings are found in the international research on effective teams. Conversely, research on large cooperative ventures show their ineffectiveness and fragility.

DEA should engage role-players in the sector in understanding the constraints and collaborating with other organs of state to articulate policy regimes in support of the strategy.

7.8 Industrial strategy (and communities) should engage the historical, strategic and tactical issues within the landscape

Historically, bio-piracy of Southern African genetic resources has been a springboard for the growth of multinational corporations who have never been held accountable. For example:

> *"The healing properties of the plant that came to be known as devil's claw have been recognised by the Khoisan people of the Kalahari long before they were primarily divulged to a German colonial soldier in the late 19th century. However, the originators of the medicine were neither addressed through patent negotiations nor did they benefit from the large commercial success of the drug in Germany where it turned into the third most frequently used natural drug of all. Currently, corporations like Ratiopharm or Hexal offer a 50mg extract of devils claw in tablet for roughly 25 euros [roughly R500] whereas San plant gatherers in Namibia are paid at best 30-40 cents per kilogram of dried tubers, while others are hired for no more payment than food and drink" (Reihling 2008: 18).*

This pattern remains today. The product of two years of work by Mrs Fihla's co-op will result in a fraction of its value. For 90% of the work, she will receive 10% of the rewards. Litigation is one avenue open to her to address her concerns. This is probably a lose-lose scenario, even assuming she had the resources to litigate against multi-national corporations. Engaging the strategic and tactical possibilities is another option. The feel-good factor is key in the cosmetics and food/beverages sectors; there are existing legislative instruments such ABS regulations and Broad-Based Black Economic Empowerment (BBBEE)scorecard funding for enterprise development and supplier development to enable private sector participation; and there are potential win-win scenarios in the private sector partnering community initiatives.

The essential oils being produced by Essential Amathole are too low-volume to provide direct market access. For example, Essential Amathole is likely to produce about 20 litres of peppermint oil this year, while a corporate buyer such as Nestlé is only interested in volumes of the order of 2 000 litres.

Consequently, there are two traders nationally who buy from small producers and retail to domestic and international markets. In the process of doing so, they often negotiate sellers down, and in any event appear to earn most of the money for least of the work. Providing direct market access can be done through the supplier-development and enterprise-development BBBEE scorecards from corporates, bypassing the biotraders, and would substantially improve the viability of developmental initiatives.

DEA and the the dti should facilitate win-win partnerships between the global and domestic corporate sector and South African community and commercial producers of essential oils, using ABS and BBBEE scorecard funding as the mechanism.

7.9 Pay careful attention to the possible end-game in considering the opening gambit

The ABS regulations are currently being implemented by some elements of the private sector in ways that potentially reify apartheid-era social constructions of ethnicity. As noted by Morris:

> *The translation of international biogenetic resource rights to a former apartheid homeland is fostering business partnerships between South African traditional leaders and multinational pharmaceutical companies. In the case of one contentious resource, these partnerships are entrenching, and in some instances expanding, apartheid-associated boundaries and configurations of power. The state and corporate task of producing communities amenable to biodiversity commercialization and conservation is entangled with segregationist laws and spatial planning. Rather than exclusion and the closure of ethnic boundaries, resource rights in this context foreground forced enrolment and the expansion of indigenous group-membership as modes of capitalist accumulation in an extractive economy* (Morris 2016: 2).

This represents an emerging juridical issue:

> *The definition of community in the South African context is complex and evolving and has been the subject of a number of legal cases which have emphasised the importance of looking at customary and living law and practices that define community membership, including shared rules that determine access to, use of, or benefits from a resource or property right held in common by the group. The definition in the BABS Regulations must be understood broadly in line with this developing jurisprudence* (Myburgh 2011: 855).

DEA should clarify the ABS requirements and regulate these more specifically, in the evolving juridical context.

7.10 Facilitate market access through export development schemes

The domestic market for essential oils is very small. While using the BBBEE scorecard funding for enterprise development and supplier development may be helpful for developmental projects, accessing international markets is, however, key to growing the industry as a whole. SA is highly quality-competitive and price-competitive in essential oils, and has unique species currently being sought by international traders. Yet SA is one of very few countries that fails to provide "pavilions" for domestic retailers at international trade fairs. Some local producers now access these markets under other expensive (about R200 000 for a small stall) schemes. The dti's support to open access to international markets is key to growing the demand side. lf the industry could double sales, employers project they could almost double employment in the sector.

The Centre for the Promotion of Imports (CBI) (an initiative led by England, Switzerland and Netherlands) ran a very helpful programme educating South African producers on accessing international markets. A strategically-led and ongoing follow-up programme spearheaded by the dti to build these skills/capabilities would support the industry to do this more independently, both individually and sectorally.

The dti should put in place an export development programme for the essential oils industry.

7.11 Invest in quality control and packaging

Packaging essential oil products for export purposes is fraught with legal and logistical challenges. Packaging absorbs as much as 5/6ths of the costs of exporting, unprecedented in bioprospecting internationally. Further investigation is required, but a partnership with SA's world-class packaging industry may assist in resolving the challenges.

Organic certification is required to access international markets. The dti has an incentive scheme in place for this, which should be rolled out more intensively in the essential oils sector.

7.12 Articulate the rollout of BES with the wider land reform and water management strategies

The "one family – one hectare" land reform strategy currently being piloted under Department of Rural Development and Land Reform may provide a useful point of policy coordination for the roll-out of the bioprospecting strategy: essential oils are one of the most profitable possible uses of such land.

However, the multiyear drought cycle currently occurring in South Africa is affecting production in some areas. Some commercial farmers report having moved operations to other countries as a result.

Water efficiency strategies and water stewardship need to be integrated into industrial planning for essential oils.

7.13 Review the role of technical and scientific agencies to enable a more developmental agenda

The fieldwork for this case study found very wide-spread criticism of the role of the technical and scientific agencies mandated to support the development of the bioprospecting industry in South Africa (in particular, the CSIR). Without necessarily conceding the validity of the concerns raised, the CSIR, in response, has evinced deep concern regarding the issues raised and a willingness to engage the sector. The issue is perhaps symptomatic of the critique that:

> *"under the label of empowerment and participation, which adds ethical value to state institutions and multinational corporations, still lurk historic power differentials between North and South, as well as between scientists, holders of local knowledge and resource providers" (Reihling 2008: 24).*

The CSIR should participate in the expansive learning strategies proposed, engaging the sector on their mandate and role.

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