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**STUDY TO DEVELOP A STRATEGY FOR THE DEVELOPMENT OF A
VIABLE ESSENTIAL OILS INDUSTRY IN SOUTH AFRICA**

REPORT 2:

Strategy and Implementation Plan

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STUDY TO DEVELOP A STRATEGY FOR THE
DEVELOPMENT OF A VIABLE ESSENTIAL OILS
INDUSTRY IN SOUTH AFRICA:

Report 2:

Strategy and Implementation Plan

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LIST OF ACRONYMS

ARC	Agricultural Research Council
ASNAPP	Agribusiness in Sustainable Natural Plant Products
BEE /	Black Economic Empowerment / Broad Based Black Economic Empowerment
BBBEE	
CASP	Comprehensive Agricultural Support Programme
CDP	Cooperative Development Programme
CHEMIN	South African Chemical Technology Incubator
CIS	Cooperative Incentive Scheme
CSI	Corporate Social Investment
CSIR	Council for Scientific and Industrial Research
CTFA	Cosmetic, Fragrance and Toiletries Association
DAEARD	Department of Agriculture, Environment and Rural Development (KwaZulu-Natal)
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of South Africa
DEA	Department of Environmental Affairs
DFI	Development Finance Institution
DST	Department of Science and Technology
DTI	Department of Trade and Industry
DWAF	Department of Water Affairs and Forestry (now known as the Department of Water and Environmental Affairs)
ECDED	Eastern Cape Development Corporation
EMIA	Export Marketing and Investment Assistance
EU	European Union
FAO	Food and Agriculture Organisation
FMCG	Fast Moving Consumer Goods
FRIDGE	Fund for Research into Industrial Development Growth and Equity
HDPE	High Density Polyethylene
HS	Harmonised System – refers the coding system for identifying products that are traded worldwide
IDC	Industrial Development Corporation
IKS	Indigenous Knowledge Systems
INR	Institute of Natural Resources
JAG	Joint Action Group (a type of sector association)
LRAD	Land Redistribution for Agricultural Development Programme
MAFISA	Micro Agriculture and Rural Financing Scheme
NAFTA	North American Free Trade Agreement
NDA	National Development Agency
NEDLAC	National Economic Development and Labour Council
NGOs	Non-Government Organisations
NQF	National Qualification Framework
NRF	National Research Foundation
PPECB	Perishable Products Export Control Board
SA	South Africa
SAAFFI	South African Association of Flavour and Fragrance Industry
SABS	South African Bureau of Standards
SADC	Southern African Development Community
SAEOPA	South African Essential Oil Producers Association

SANAS	South African National Accreditation System
SANBI	South African National Biodiversity Institute
SARS	South African Revenue Services
SEDA	Small Enterprise Development Association
SEOBI	SEDA Essential Oils Business Incubator
SMEs	Small and Medium Enterprises
SMMEs	Small Medium and Micro Enterprises
SSAS	Sector Specific Assistance Schemes
STP	SEDA Technology Programme
SWOT	Strengths, Weaknesses, Opportunities and Threats
TTSI	Technology Transfer for Social Impact
TUT	Tshwane University of Technology
UP	University of Pretoria
USA	United States of America
USAID	United States Agency for International Development
USD/US\$	United States of America Dollars (currency)

1 INTRODUCTION

This report identifies strategies for the development of the essential oil sector in South Africa. The methodology used in developing the strategy was to first identify a set of strategic issues that needed to be addressed in order to grow the essential oil sector in South Africa. This information was gathered from the situation analysis (Report 1) and is based on desktop research and stakeholder contributions (see Appendix 1 for stakeholders consulted).

The strategic issues were compiled into a strategic plan discussion document and this was presented at a multi-stakeholder workshop in February 2011 (see Appendix 5). Feedback from multi-stakeholder workshop was incorporated in the strategy, which was circulated for comment, after which the final strategy document was compiled.

The strategy document summarises the key issues identified and provides a context for the strategy (Sections 2 and 3). The strategic framework, clusters and thrusts are provided in Section 4, 5 and 6 of the report. Section 7 details the proposed implementation plan for the strategy and section 8 details the proposed institutional arrangements for delivery of the strategy.

2 KEY ISSUES IDENTIFIED

2.1 Key Issues Identified from the situation analysis and stakeholder input

The SWOT analysis developed from the information gathered during the situation analysis provides a starting point from which to understand the key constraints to the essential oils sector in South Africa and to develop strategies to address these. The key points of the SWOT analysis are provided below.

2.2 SWOT Analysis

Strengths:

- Local institutions, government agencies and producer organisations show willingness to support the local essential oils industry.
- There is well developed knowledge of the essential oil industry with good market linkages established by certain companies and individuals.
- Market demand for quality essential oils exists.

Weaknesses

- Production volumes of essential oil biomass in South Africa are generally low. This has been identified as one of the factors that most constrains the growth and development of the industry.
- Lack of trust between local role-players in the value chain, particularly growers and intermediaries, resulting in lack of cooperation.
- Individual producers have limited power to negotiate prices for their oil and receive low prices for their oils.
- Lack of local quality standards for South African essential oils. African Essential Oils are generally perceived by international markets to not be fully capable and reliable in production, nor do they conform to international standards of quality (NDA, 2008).

- A lack of knowledge and information on species selection, cultivation practices and extension services to essential oil producers. This is compounded by a lack of locally relevant research (agronomics, processing, markets) and relevant, up to date information (full value chain).
- Poor understanding of quality requirements and quality control systems.
- Limited skills and technology to perform primary and secondary processing activities.
- There is a shortage of information for potential producers relating to market potential and market values of essential oils. This is compounded by a lack of marketing support and trade links for essential oils.
- It is difficult for small producers to access foreign markets directly and market their products locally.
- Lack of large volumes of oil of a good quality limits access to markets.
- High capital cost of distillation and associated equipment limits enterprise viability.
- Lack of adequate extension, training and mentorship support to emerging growers resulting in low levels of production and distillation.
- Production is inconsistent due to farmers who have not been very successful with the essential oil they produce are reverting to tried and tested crops.
- The successes and ability of emerging community growers to enter the market is disappointing. The market and information risks highlighted in the bullets above, coupled with the inexperience of emerging farmers and lack of effective support, limit the success of emerging farmer projects.
- Distillation.
 - Poor quality and low volume of biomass material entering the distilling process affects the cost and efficiency levels of the distillation processes adversely.
 - There has been a general lack of understanding by the distillers about the importance of producing quality oil with all contaminants removed before distillation. Knowledge about the required technical standards is lacking including an understanding of some of the fundamentals such as the importance of the special container for storage of the distilled oil.
 - Access to knowledge of best equipment and advisory services with respect to distillation equipment and processes.
 - The cost of energy to drive the distillation process is an important consideration in the overall production cost process.
 - The high cost of transporting plant materials to distilleries constraints the scale of the distillation plants. This relates to the high level of decentralisation of distillation plants leading to inconsistencies in the quality of the outputs.
- The production, financial and market risks that the farmers face are high. Production risks are generally high due to a shortage of appropriate information; financial risks are high due to the general unavailability of finance for the relatively unknown essential oil markets; and market risks are high due to unsecured / unpredictable market prices.

Opportunities

- Diverse climatic conditions and a wealth of untapped indigenous biodiversity.
- Opportunities to support research for optimisation of production, new crops and development of the value chain (markets in particular).

- Labour intensive production, particularly for organic production means job creation opportunities.
- Sector currently at a low level of development; opportunities for growth.

Threats

- Lowered demand for essential oils as a result of a slower global economy.
- Current strong rand hampers profitability in international markets.
- Fluctuations in exchange rates make planning difficult.

2.3 Priorities to be addressed by the strategy

The information gathered during the situation analysis phase highlights that the following are key issues that need to be addressed to develop the essential oil sector in South Africa:

- Coordinated support to the growth of the sector, along with cooperation and transparency between sector stakeholders (Government, private sector and NGOs).
- The need for research into (1) optimising production (Agronomic practices, cultivar selection, irrigation, etc.), (2) quality control along the value chain and (3) identifying and developing market opportunities.
- The sector is in its infancy – strategy should focus on a process towards developing the value chains.
- The need to significantly upscale primary production to develop a “market presence” for South African Essential Oils.

It is important to point out that the situation analysis and stakeholder input primarily identified crosscutting sector issues that required strategies and few species specific strategies were identified. It was agreed by stakeholders at the workshop that it was important to address the cross cutting issues as a priority for facilitating sector development. . Where possible, strategies for specific essential oils have been identified in the strategy. These have been drawn out of the strategy and are summarised in section 8.1.

3 CONTEXT FOR STRATEGY

3.1 Current reality

The current reality of the sector is that it is a small, emerging sector, which is fragmented and has poorly developed value chains. This means that the sector requires significant research and development training and infrastructure development.

Broadly, there are three tiers of producers, illustrated graphically in Figure 1 below.

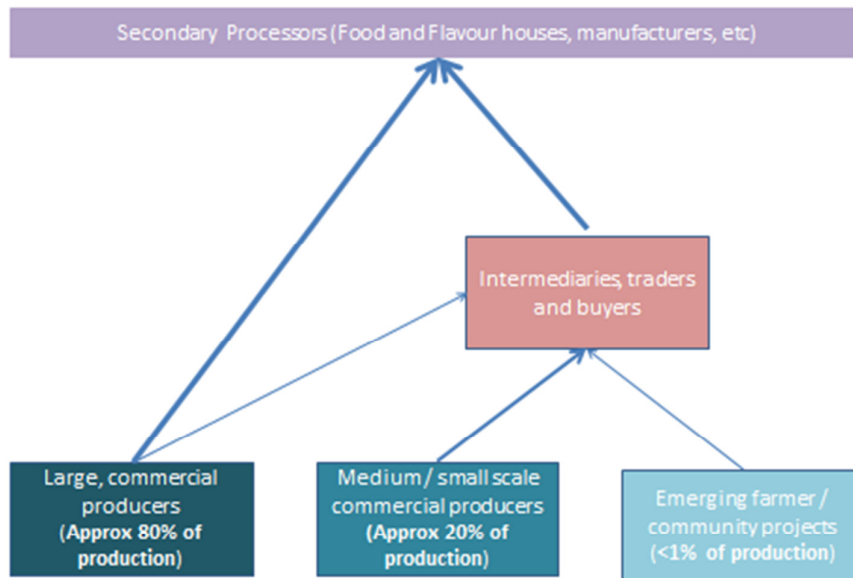


Figure 1: Current production and marketing arrangements of essential oil producers in South Africa (excluding local value addition).

The large well-established commercial producers have defined markets for their produce, usually directly to the secondary processors, such as food and flavour houses and manufacturers.

Medium and smaller producers, due to lower volumes and possibly inconsistency in production sell raw oil through intermediaries and may also do some of their own value added products at a small scale.

Emerging farmer and community funded projects represent a tiny fraction of production and supply what oil they produce to intermediaries, with little or no value addition.

The key constraints at a general level to the essential oil sector in South Africa are:

- There is a lack of biomass production and volume of oil production. This constrains the development of the whole value chain.
- Producers and traders are price takers, subject to global market forces which are out of their control. Therefore increased volumes (economies of scale) and quality (market security and

penetration) are the two main avenues through which competitiveness can be enhanced to facilitate sector growth.

- There are few local buyers and distributors. This results in perceptions that traders are behaving in a monopolistic manner and paying below market prices. This is a reality associated with an emerging sector. The current traders are competing for small volumes of locally produced oil and consequently there is little room for new players and healthy competition, until production of oil has been scaled up, resulting in perceptions of monopolistic behaviour which may or may not be true.

Reasons cited by commercial farmers that affect their decision to choose essential oils as a crop are as follows

- Labour and management costs, particularly in the context of competition from some producing countries with subsidies and low labour costs. In a volatile and uncertain market, as is the case with essential oil production in South Africa at the moment, farmers will limit risk by growing crops that they are familiar with and where markets are fairly certain.
- Land claims caused farmers to cease production and further planning.
- Fluctuation in quality and yields.
- Organic requirement of buyers.
- Fluctuation of currency makes long term planning difficult.

Challenges associated with Government led projects / community growers can be summarised as follows:

- Lack of clear leadership and accountability within group structures.
- Age profile of participants.
- Inadequate extension / mentorship support (private or public).
- Lack of internal capacity (technical, financial, institutional).
- Unfamiliar crop.
- Many seeking wage-based employment.

A major constraint to the sector is that primary producers are exposed to high risk in an uncertain market. Markets do exist for essential oil and large commercial producers have successfully accessed these markets directly. Smaller producers, however, generally have to make use of buyers and distributors and have limited power to negotiate prices. If a producer is bearing a lot of risk *and* getting low return, they are likely to revert to 'safer' crops. This compounded by a lack of information and research and limits the expansion of primary production and consequently the growth of the sector.

Strengthening the role of producers requires cooperative bargaining. To achieve this, cooperative entities should be established to allow for collective bargaining in terms of price and markets. The cooperative entity should be a mechanism rather than an institution. In other words, it should be driven from the bottom up to achieve producer objectives such as higher negotiated prices, provide basic quality control and disseminate information, as illustrated in Figure 2.

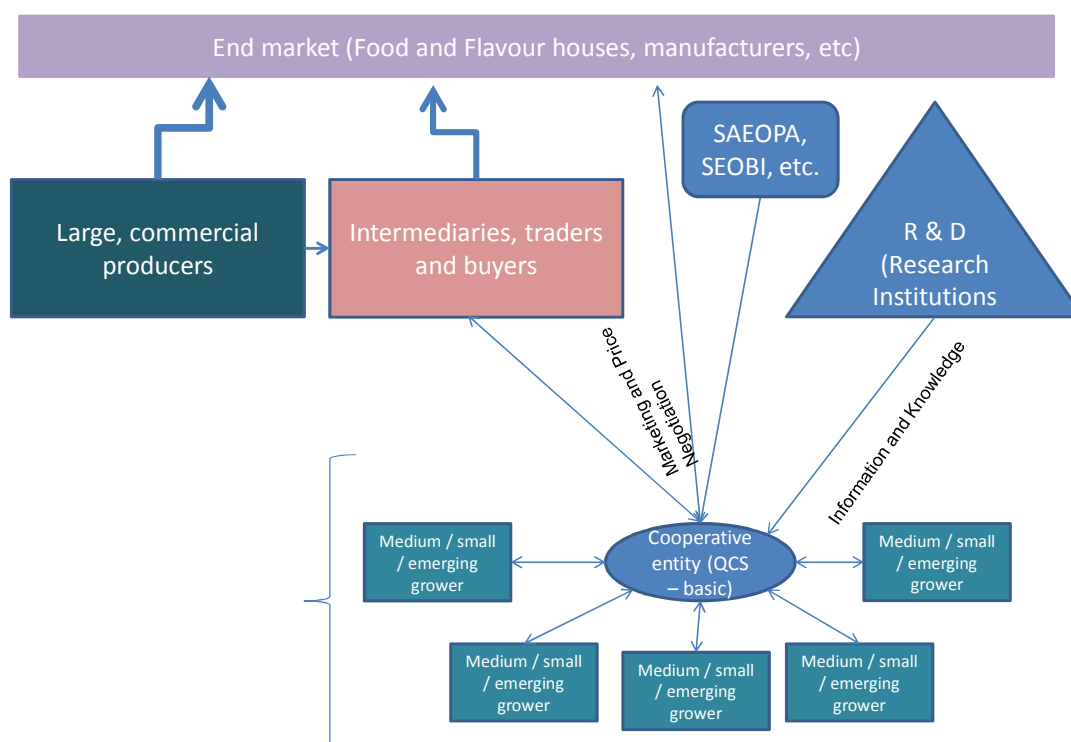


Figure 2: Proposed structure for medium and small scale producers

Producers should be encouraged to form these entities with support from producer organisations and state extension services, rather than imposing this mechanism on producers. This approach will enhance ownership of the cooperative entity and producers will also be in a position to determine the structure and purpose of the cooperative entity.

3.2 Possible growth paths for the essential oils sector in South Africa

Three possible growth paths have been identified for the essential oils sector in South Africa, which would require different approaches to, and investment to develop the sector:

1. Large and rapid growth path – this requires huge investment in infrastructure, skills and technology to fast track the development of the sector.
2. Slow, long-term expansion – this requires smaller investment which will need to be sustained over a long period of time.
3. Two-tier approach – here, limited interventions in market forces are made and input suppliers, producers, processors, intermediaries continue their commercial operations. However, these roleplayers should be involved in providing advice and market access to essential oil projects. In other words, the private sector determines the growth path and speed of their roles in the value chain, with minimal state intervention. However it is important that the state provides the enabling space in which the sector can develop through indirect support. The key role of government in terms of direct support is to the emerging sector. However, it is recognised that

many value chain functions, market access and quality control in particular, are highly specialised functions. Consequently, it is necessary that the state and the private sector work together in developing these components of the sector.

Option 3, the two-tiered approach is the recommended growth path for development of the essential oil sector for the following reasons:

- The business of business is business: Essential oil production, processing and marketing is highly specialised. Private sector role-players have invested in time and capital in developing their production and processing capabilities and developing markets for their produce. They have the knowledge and know how to determine how their individual enterprises grow, and in so doing, developed the sector. Many of these challenges of the industry lie beyond the scope of government to address due to the specialised nature of the sector. However, the emerging sector will face the same challenges and require support from the private sector to overcome these challenges.
- The role of government is to create the enabling environment the growth of the sector. To this end, the role of government is to allow economic forces to dictate the growth path with minimal direct intervention, but playing a facilitatory role.
- Various spheres of government have invested in essential oil projects. On-going direct support to emerging farmers is required through infrastructure provision, skills development, capacity building and management and mentorship support. Direct support to emerging producers is aligned with policy objectives of social spending and job creation and the new growth path policy. However, this support should aim at developing meaningful long term job creation through establishing financially sustainable enterprises rather than short term job creation through public work programme approaches to essential oil project development.

The goal of government, and this strategy, is to grow the total industry which can be achieved by providing two modes of support to the sector, which are described below.

3.3 Modes for the support of the essential oil sector in South Africa.

Two fundamental modes of government support for the sector are recognised:

1. “Soft” support – this relates to the creation of the enabling environment for the growth and development of the sector and relates to the provision of services such as research, information sharing, technical know-how, export promotion and value chain development and alignment. Soft support should seek to enhance the growth of the sector as a whole.
2. “Hard” Support relates to the implementation of production and processing projects. These are discrete project-based interventions where direct support to primary production and primary processing is provided through the provision of inputs, infrastructure, training, extension and management support for the production of essential oils. Hard support will be focussed on emerging black farmers.

3.4 The potential for income generation / employment creation by the essential oil sector in South Africa

As detailed in the situation analysis, the essential oil value chain consists of primary production, primary processing (distillation), secondary processing (rectification, fractionation, bulking and blending) and tertiary processing (manufacturing of products containing essential oils). Because the amount of essential oils used in tertiary processing is so small (usually between 0.1 and 0.5% of final product)-this has not been included in the employment creation analysis.

Furthermore, secondary processing is a highly specialised technical process with a few practitioners in South Africa (the study found that there were three companies / people who provided this service). The potential to leverage job creation in secondary processing is limited, but with significant expansion in primary production, income generation opportunities could be provided for 50 people in secondary processing. This includes technical specialists and support staff.

Primary production is the main area in which job creation can be leveraged, as essential oil crop production is labour intensive. In addition, the market preference for organically produced essential oils means that certain management practices that would have used chemicals (e.g. weed control) would instead hand weeding and as a result, makes the crop even more labour intensive. The direct labour requirements for essential oil production in-field range between one person per hectare and one person per two hectares, depending on the crop. This includes seasonal labour requirements during harvesting. In addition to this, it is estimated that an additional three people are required for distillation, assuming that there is one distillation unit per thirty hectares under production and for every 30ha, one supervisor / manager and two general workers are also required¹. Thus, for every 30ha under production, there will be:

- 15 Labourers.
- 2 individuals involved in distillation.
- 2 general workers.
- 1 manager / supervisor.

This gives a total of 20 employed per 30hectares per annum. Using this ratio and based on current estimates that there are 1 970ha under production, it is estimated that the sector currently employs 1 313 individuals in primary production and primary processing. The demand for essential oil exists both locally and internationally. Expansion in production up to 20 000 hectares should not present any challenges in terms of market absorption of bulk essential oil. However, in the medium term (ten year horizon), logistical and technical limitation mean that an expansion from the existing 2 000ha to 20,000 under production will be difficult to achieve. A realistic expansion of 8 000ha (i.e. up to 10 000 ha in total) over ten years can be achieved. Should this be achieved, employment opportunities for 5 300 individuals would be possible. It is important to point out that these are estimates of job creation potential. To achieve an expansion in production of this magnitude requires significant investment and support, particularly in the provision of information, extension, mentorship and training as well as research into optimum production practices.

¹ This information is based on estimates from a number of sources: Horak, pers comm; DST, Undated; Kukhufi, pers comm and DAFF, 2009

4 STRATEGIC FRAMEWORK

The strategic framework has been developed using information from the situational analysis which considered various approaches to supporting the essential oils sector, opportunities and constraints to the development of the sector as well as inputs from stakeholders. This information was used to develop a vision for the sector, a set of strategic principles. From this, a number of strategic thrusts and actions to be implemented to facilitate the further development of the essential oil sector in South Africa are identified. These are detailed in the sections below.

4.1 Vision

“The growth and development of a robust, competitive essential oils sector producing and processing quality products for local and international markets”

The vision represents the desired growth path for the essential oils sector in South Africa

4.2 Strategic Principles

The principles provide guidance to stakeholders (government in particular) on how the strategy will operate.

To encourage the production of essential oils as part of a broader mix of on-farm enterprises. The seasonal nature of income from essential oils can cause cash-flow problems. Diversification of enterprises reduces on-farm risks and can smooth cash flow.

To create employment and income generating opportunities through encouraging farmers to grow essential oils and entrepreneurs to develop value added products: This is aligned with prevailing policies of employment creation and value addition and seeks to develop the value chain.

Production and processing should be supported based on clearly identified market opportunities: Sector stakeholders should work collaboratively to identify and access markets for essential oils.

Support for primary production is the starting point for value chain development and should be clustered geographically: Value added products require raw materials (i.e. primary production). The key area where job creation can be leveraged is under primary production. Furthermore, volumes of bulk essential oil production in South Africa need to be increased dramatically to attract buyers and compete in international markets. Geographic clustering provides targeted support and efficient allocation of resources.

Cooperation and partnerships between the emerging sector and the commercial sector, with support from government is necessary for the growth of the essential oils sector. Partnerships between Government, producers and intermediaries should be established to enhance sector growth.

Value chain development requires the identification and support of entrepreneurs: Entrepreneurs should be identified and supported, regardless of whether they are operating individually, through a cooperative or other form of legal entity.

Value chain development requires focussed research articulated by role-players in the essential oil sector: Relevant research will enhance sector growth and development and should be focussed on increasing productivity within the essential oil sector.

To work with economic market forces. This recognises that interference in market forces will be counterproductive and implies that the sector is responsible for addressing the constraints to the sector, with Government playing a supporting role (i.e. increasing volumes and quality).

4.3 Goals

There are three overarching goals for the development of the essential oils sector

1. To facilitate **growth** by increasing the output of essential oils from South Africa
2. To **develop** the sector through gaining international and domestic market share
3. To **enhance enabling processes** that facilitates equity and transparency between role-players in the value chain

4.4 Objectives of the Strategy

The objectives provide the means through which the impact of the strategy can be measured.

- To strengthen the performance of producers of essential oils through coordination and alignment.
- To increase biomass production (i.e. expand areas of cultivation / harvesting) and to increase the volumes of oils produced (efficiency in processing).
- To enhance the quality of essential oils being produced (through interventions along the value chain).
- To achieve geographical clustering of support.
- To improve the image of the South African essential oils industry in order to gain market share.

5 STRATEGIC CLUSTERS AND THRUSTS

There are four strategic thrust areas designed to achieve the objectives of the strategy. These are key areas where strategic intervention is required. Broad actions for each strategic cluster area are provided under the relevant headings in section 5.1 to 5.4 below.

The strategies are generally cross-cutting and address challenges related to the three key components of the value chain (primary production, processing, and marketing). Species specific strategies, where relevant, are provided in the relevant strategic cluster and are detailed further in section 7.1.

1. **COORDINATION AND ALIGNMENT:** Establish systems and processes which facilitate dialogue, information sharing, cooperation, partnerships and transparency to enhance sector growth.
2. **CAPACITY DEVELOPMENT FOR SECTOR GROWTH:** Training, technical support and information provision are interlinked. The establishment of systems which ensure appropriate and committed training, extension and mentorship support is provided. The focus should be on developing and disseminating information that will enhance productivity, improve quality and facilitate access to markets through extension and mentorship.
3. **MARKET SUPPORT AND DEVELOPMENT:** Producers must be able to make informed choices regarding the potential markets for the crops they grow. Marketing is a specialised activity and producers should be assisted to access markets for their oils. Market support should also increase access to markets by profiling and branding South African essential oils.
4. **KNOWLEDGE GENERATION THROUGH TARGETED RESEARCH:** The focus here is (1) to conduct research that will enhance volumes and quality of oils being produced through conducting agronomic and post-harvest research and (2) research new essential oil products (indigenous and exotic) that have potential as well as value added products that can be brought to the market. Research should be guided by sector stakeholders and the outcomes of research should inform capacity development programmes.

Funding and institutional arrangements for delivery are discussed in section 8. This section proposes institutional arrangements for implementing the strategy and aims to also ensure that limited resources are allocated efficiently to achieve growth and development in the sector.

5.1 Strategic Cluster 1: Coordination and alignment

Industry fragmentation should be addressed through coordination and alignment of activities by sector role-players. Three strategic thrusts which will improve coordination and alignment have been identified:

1. Establish a representative coalition of stakeholders to support the development of the sector.
2. Facilitate partnerships between sector stakeholders
3. Provide coordinated support to grow the sector

Thrust 1.1: Establish a representative coalition of stakeholders to support sector development

Value chain participants in the essential oil value chain can be divided broadly into four groups:

- Input suppliers.
- Producers / primary processors.
- Processors and manufacturers.
- Exporters / marketers.

It is acknowledged that there is overlap between these broad groupings, with some value chain participants performing more than one of these functions.

Given the fragmentation and lack of relevant and reliable information for the sector, it is necessary to promote and develop structures and systems that enhance communication between these value chain roleplayers. It is important that the specific interests of each value chain grouping are catered for, but it is also necessary for the different role players to interact and share information and experiences to enhance sector growth. A model for the proposed arrangements for these are provided in Figure 3 and discussed below.

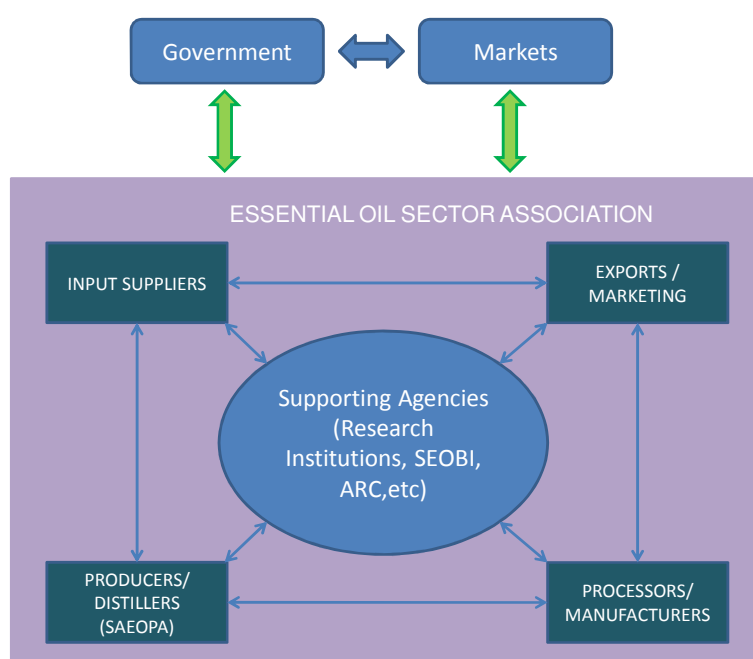


Figure 3: Proposed structure for sector association

The membership of the sector association consists of the four major value chain roleplayers and agencies involved in the support of essential oil production. Each group would represent the interests of their members (constituency) within the association.

It is necessary that the establishment of this association is driven by sector stakeholders who should take ownership of the organisation and develop the structures to represent their interests. It is not the responsibility of government to establish the organisation; however the state should play a role in facilitating the process.

The primary objectives of the association should be to:

- Articulate research and development needs.
- Ensure balance in terms of representation of growers, processors and intermediaries (government should play a role in ensuring representation of resource poor stakeholders).
- Facilitate access to and sharing of information.
- Ensure transparency in business dealings to address the on-going perception of distrust.
- Work closely with organs of state in guiding the development of the sector and in particular community / emerging farmer projects.
- Providing direct support to projects as service providers (support and outreach).

Important stakeholders who should be engaged / included in the development of the association include Government (DTI, DAFF, DST), Parastatals (SEOBI, ARC, CSIR, ECDC) Private sector producers and processors (e.g. Clive Tuebes CC, S&D Botanicals, Buzby Oils, African Rose) and organisations currently supporting essential oil projects (e.g. SAEOPA, Winrock Foundation, Chemin, Tswhabac, Chemicity).

Thrust 1.2: Facilitate partnerships between sector stakeholders

Skills and resources of commercial essential oil producers and processors must be shared with emerging essential oil farmers. Through the essential oil association, commercial growers should articulate what support can be provided to support the emerging essential oil farmers and how this support can be provided.

Commercial growers are generally willing to assist where they can, but are also aware of the risks of failure in partnering with emerging growers. The role of government in promoting these partnerships is to provide measures that will mitigate these risks. Building capacity through such partnerships can take place in a number of ways, including:

- Providing financial and technical support to emerging growers, conditional on partnerships being established.
- Appointing experts from the private sector to assist with resolving technical and institutional problems that require specialist input (e.g. agronomic, distillation, markets).
- To ensure that buyers of essential oils enter into supply agreements with growers to guarantee markets. This does represent a risk to buyers should crops fail and measures to mitigate these risks would need to be implemented.
- Secondment of extension services to producers in the identified geographic clusters to build capacity to support emerging growers.
- Mentorship programmes with commercial growers.

Thrust 1.3: Provide coordinated support to grow the sector

There are a range of stakeholders (government, NGO and private sector) that are supporting essential oil production and processing initiatives. To reduce duplication of efforts and sharing of information, systems that enhance coordination of support to essential oil production are necessary. The establishment of a working group to form a national reference centre for essential oils, as part of the sector association is recommended for coordinated support and knowledge sharing. Activities would include commissioning of research and commissioning of experts to support projects or resolve production, processing or marketing problems.

5.2 Cluster 2: Capacity development for sector growth

Capacity development for sector growth requires:

- Coursework development for short courses, field based training and tertiary training coursework development.
- Technology transfer, particularly in relation to varieties, production and distillation.
- Disseminating and sharing information (production, processing and markets).

Investment in capacity building and information dissemination programmes will enhance growth and productivity in the sector, particularly among emerging growers.

Thrust 2.1: Training

Training and extension support are necessary to build the necessary capacity to:

- Develop and support good agronomic practices for the production of produce higher biomass yields and oils of high quality.
- Ensure effective distillation of essential oils.
- Access markets and negotiate prices for oil.

Thrust 2.2: Extension and mentorship support

Extension and mentorship is necessary to ensure that producers of essential oils are supported in all aspects of production. Dedicated extension support by individuals who have the skills to support various aspects of essential oil production are necessary for this. Consequently, it is first necessary that government extension services who should be providing support to essential oil producers are provided with the correct information and training to deliver accurate technical advice to growers. To achieve this, it is recommended that a number of extension officers are provided with training on essential oil production. These extension officers should be located in regions where essential oils are being produced, and aligned with the geographic clusters that have been identified.

Secondly, NGOs and other agencies supporting essential oil projects (e.g. SEOBI, SAEOPA, ARC, CSIR, Tshwabac) should be provided with the necessary support, resources and capacity to continue supporting existing projects and rolling out new projects. It is critical that regular extension and / or mentorship support is provided. All funded projects should have explicit mentorship / extension programmes in place to ensure that the chances of project success are significantly improved. Expenditure on skills development, mentorship and extension is as important, if not more, than the provision of infrastructure, inputs and equipment.

To achieve effective state extension support to the essential oil sector, it is recommended that high level interactions between the Department of Agriculture, Forestry and Fisheries and thedti take place to agree on how support to the essential oil sector should be provided by national and provincial government departments. It is acknowledged that thedti is not mandated with supporting primary production however interdepartmental liaison is necessary to provide support to the sector and to facilitate the expansion of primary production in the short term.

Implementing these measures will enhance technical capacity and know how in the production and distillation of essential oils.

Thrust 2.3: Information Dissemination

The generation of information is important, however even more important is the dissemination and sharing of information. In line with the research focus areas, information dissemination should consider production, processing, markets and economics.

5.3 Cluster 3: Market Support and Development

Producers of essential oils need to be able to make informed decisions regarding their choices of essential oil crops to be grown. These elements include agronomic considerations, expected production volumes and, importantly, prices that can be expected for their oils. Market information is therefore critical for growers to make decisions. Market support and development should be providing the following information to essential oil producers:

- Quality requirements for markets.
- Expected volumes required.
- Approximate prices to be expected.

Producers of essential oils experience difficulty in marketing their oils. Marketing is a specialised activity and producers should be assisted to access existing and new markets for their oils.

Thrust 3.1: Develop market linkages to improve market access

This strategic thrust focuses on developing and enhancing market linkages to domestic and international markets. While it is important to increase volumes and quality of essential oils being produced in South Africa, it is equally important that South African essential oils are profiled to domestic and international buyers.

Markets for essential oils are fluid and fluctuate depending on supply and demand, exchange rates and oil quality. It is also important to note that marketing quality control of oils is a highly specialised field. Consequently, particularly for small growers, it is necessary to make use of intermediaries who have access to markets and market information. Producers of essential oils who do not have markets for their oils should work closely with the proposed association and intermediaries to better understand the market for essential oils.

It is also important that perceptions of unfair practices by intermediaries are addressed by promoting transparent and open dealings in the sales and marketing of essential oils and essential oil products. Producers and marketers should work together through the association to develop mutually beneficial relationships for the growth and development of the sector.

The state also has a role to play in encouraging local manufacturers to use locally produced essential oils, where available, in their formulations. Engagement with manufacturers are necessary to understand their requirements and to facilitate the development of supply agreements from local sources of essential oils

Niche market opportunities exist through fair trade and organic certification of essential oils. Consumers are increasing becoming aware and are concerned about how the products they buy are produced from a social and environmental perspective, particularly in the cosmetics sector.

Thrust 3.2: Meeting market requirements

International quality standards for essential oils are quite specific. To ensure that consistent quality standards are achieved, growers need to understand what the market requirements are and what needs to be done to meet these requirements. Currently, intermediaries are largely responsible for ensuring that quality standards are met by refining the oils that are supplied to them by growers. Through the association, intermediaries should be engaged to understand how growers can be capacitated to produce higher quality oils. Protocols for enhancing quality should be developed and disseminated to growers to enhance the quality of their distilled oils. Of particular importance is the development of cultivars that are suited to local conditions and produce high yielding, good quality oil crops. It is also necessary to establish standards for South African essential oils.

5.4 Cluster 4: Knowledge generation through targeted research

Research is critical to the development of the sector. Research should include the agronomic, processing and market aspects of essential oils. Research activities in support of essential oil production should be focussed in two key areas, namely:

- Agronomic and post-harvest research (i.e. production and primary processing).
- New essential oil crop and product research and development.

Thrust 4.1: Agronomic and post-harvest research

Production research on species should be conducted in areas where production is currently occurring (i.e. use geographic clustering for research on species) to enhance yield and oil quality up to point of harvest. In addition, post-harvest technologies to maintain yield and quality are also necessary.

Post graduate research into production, distillation, quality control and markets should be encouraged at tertiary institutions.

Proposed research activities:

- Optimisation of production (agronomic practices, cultivar selection, plant breeding, irrigation, etc.).
- Research post-harvest technologies that optimise production efficiencies and quality.
- Research quality control systems and processes along the value chain.
- Support essential oil research at tertiary institutions, at post graduate level.

Thrust 4.2: New essential oil crops and product research and development

There are existing commercial crops that have potential for commercialisation in South Africa, as well as opportunities for the commercialisation of indigenous plants for essential oils, which should be investigated.

The development of value added products represents opportunities for small and medium scale processors. Niche products in small quantities do represent opportunities for further processing of essential oil products, particularly in perfumery, cosmetics and personal care products. The approach here should be to focus on supporting entrepreneurs with skills, technology, processing equipment and market support to develop products and access target markets.

6 DETAILED DESCRIPTIONS OF STRATEGIC CLUSTERS AND THRUSTS

Cluster 1: Coordination and Alignment

Thrust 1.1: Establish a representative stakeholder coalition to support the development of the sector

Project 1.1.1: Facilitate establishment of sector association

Activity 1: Conduct a stakeholder workshop

A stakeholder workshop should be hosted by the Department of Trade and Industry to initiate the establishment of the sector body. Stakeholders should be invited to discuss the concept of establishing an essential oils association and obtain mandates from their constituents. The primary outputs of the workshop would be to:

- Solicit buy in from the stakeholder groups regarding the need and desirability for an association.
- Decide on which stakeholder groups should be represented and why.
- Discuss options for financing the association. This should include government grants / export promotion programmes as well as mechanisms for self-funding.

Based on the outcomes of this workshop, stakeholder groups should engage with their constituents to nominate representatives to attend future workshops. Representatives should be mandated by members to participate and negotiate on behalf of their members.

Activity 2: Make conditional grants available as an incentive to establish the sector association

Funding a sector association on subscriptions is difficult where the sector is small and fragmented, as is the case with the essential oils sector.

The concept of challenge funds and calls for proposals can facilitate the establishment of the sector association. The purpose of the sector association revolves on support to and development of the sector. Government should make funds available for the support of essential oil projects that can only be accessed through the sector association (i.e. membership is a prerequisite). Such projects would include extension and mentorship, research and market development initiatives detailed in the strategy. Making such funds available would encourage sector stakeholders to work together to establish the sector association in order to access these funding streams. This would also increase membership subscriptions for the funding of the association's secretariat work.

Activity 3: Formation of sector association

It is the responsibility of sector stakeholders to establish the association. Stakeholders should agree on the following to achieve the establishment of the sector association.

- Structure of organisation (Institutional – legal entity, office bearers, etc.).
- Purpose and function of the association.
- Relationship with government.
- Funding of the association.
- Logistics and offices.
- Communication and information sharing.

- Establish association.

It is important that resource poor stakeholders are represented at these meetings. Given that this group is unlikely to have resources to participate in such meetings, it rests on organs of state to ensure that meaningful participation is secured from this group. It is recommended that NGOs and parastatals, such as SEOBI, Winrock Foundation, CSIR and SAEOPA and others be commissioned to assist with this component of participation.

Activity 4: Formalise a Memorandum of Understanding (MoU) between government and the sector association.

An MoU between the association and government should be established that will clarify the roles of the partners and conditions for funding of projects that will support sector growth.

Thrust 1.2: Facilitate partnerships between sector stakeholders

Project 1.2.1: Develop partnerships between the private sector and government to grow the emerging essential oil sector

Establish partnerships between private sector stakeholders and government through the sector association. These partnerships should focus on extension and mentorship, research and market development. The establishment of partnerships should be linked to the compilation of an MoU.

Project 1.2.2: Facilitate partnerships between commercial and emerging farmers

Calls for proposals for partnership development with commercial farmers / sector association and entrant producers should be developed to facilitate partnerships between commercial and entrant producers and the allocation of resources to achieve partnerships

Thrust 1.3: Provide coordinated support to grow the sector

Project 1.3.1: Compile a database of projects and support being provided

It is apparent that there are many different initiatives seeking to establish community based essential oil production projects. This includes various spheres of government, including National (e.g. SEOBI, DST / CSIR), Provincial (Departments of Agriculture), Local (District and Local Municipalities) and other state institutions (e.g. ARC). In addition to this, there are a number of private sector and NGO initiatives being implemented.

It is necessary that the status and progress of these projects are monitored to ensure that timeous and relevant support is provided. Typically, such projects require the following types of support:

- Markets and market prices.
- Choice of crops.
- Agronomic and production information.
- Distillation infrastructure and technology.
- Training and capacity building.

A centralised database of projects which captures crops being grown, project status and other relevant information would facilitate effective support, the correct information being provided and allow linkages between production and markets to be harmonised. Having such information available

would reduce duplication of efforts and promote the efficient allocation of resources and coordinated support to essential oil projects.

It is recommended that the essential oil association play a key role in terms of managing the database and playing an advisory role, as they have access to the necessary expertise and information to enhance productivity in these projects. It is further recommended that a vetting process for projects be established to ensure that projects are potentially viable in terms of crops being chosen, markets and agronomic suitability.

Project 1.3.2: Achieve geographic clustering of production and support

Geographic clustering of essential production makes sense from a number of reasons:

- It makes sense to increase production where it is already taking place – growers have considered environmental and market factors in choosing the crops to be produced.
- Resources can be allocated efficiently to support production (i.e. focussed in specific areas)
- Sharing of knowledge in relation to common crops is enhanced and local study groups can be established.
- It provides a starting point for targeting support.

Geographic clustering does not exclude the possibility of crops being established outside of the areas identified, or new crops being introduced. In the long term, it is expected that the number and range of species being grown will increase. However in the short term it is necessary to focus support to achieve growth in existing crops being produced.

Table 1 provides an overview of crops being produced in each province and provides guidance on where geographic clustering of production by province.

Table 1: Species grown in each province, project areas under production and number of growers (After Swanepoel, 2009)

	Mpum.	Free State	N Cape	N West	E Cape	W. Cape	Limp.	Gauteng	KZN
Artemisia									
Buchu									
Citronella									
Eriocephalus									
Eucalyptus									
Geranium									
Lavender									
Lavandin									
Lemon tea tree									
Lemongrass									
Lippia									
Lippia									
Melissa (Lemon balm)									
Rosemary									
Spearmint									

Tagete									
Tea Tree									
Thyme									
Vetiver									
No of Species	7	3	3	4	3	5	5	3	11
Projected area – 2010	943	70	45	40	200	77	91	82	422
No of growers	10	5	6	5	12	18	6	7	94

Project 1.3.3: Support priority projects

Success of essential oil projects depends primarily on the commitment and capacity of the people who are growing and distilling the crops. It is therefore important that bona fide farmers who are actively farming and who are interested in growing essential oils be supported. Selection of project to be supported should consider the following factors:

- Active participation in agriculture demonstrated on the ground through field evaluations of existing crop production.
- Commitment by producers to grow essential oils.
- Clearly defined and functional leadership and management structures.
- Technical support (agronomic, distillation, markets) availability.
- Partnerships with private sector.

Individual farmers should not be excluded simply because they are not part of a cooperative or other group structure. Selection of participants should be based on merit and ability, not by association. Growers should prove themselves by successfully growing essential oil crops before infrastructure provision is considered.

Cluster 2: Capacity development for sector growth

Thrust 2.1: Training

Project 2.1.1: Develop training materials for essential oil production

Coursework development that develops skills and capacity along the essential oils value chain is necessary to facilitate knowledge generation. Training and education should be developed in the following formats:

- Short Courses: Tertiary education institutions provide short courses for agricultural production. Agricultural Colleges, Universities and Universities of Technology can provide these courses and should be encouraged to do so. Sector specialists (agronomic, processing, quality management) should be commissioned to assist with the development of these short courses.
- Field based training: Trainers who can visit production sites and provide both theoretical and practical training in essential oil production should be commissioned to provide support in the field to essential oil producers.
- Tertiary training: Institutions providing agronomic training should establish coursework programmes that allow students to specialise in essential oil production. Similarly, technical

training in engineering and chemistry fields should also provide coursework options for essential oil processing, manufacturing and quality control. This should also include dedicated institutions that offer the opportunity for specialised post graduate training and research on the various elements associated with the production of essential oils.

All coursework that is developed should comply with the National Qualification Framework (NQF) criteria and should be accredited training courses. Funded essential oil production projects should then be required to demonstrate what training courses are to be taken.

General training on agronomics is available through the AgriSETA, and existing training service providers. Training material development and activities specific to essential oils (general training on essential oil production and for specific species) should focus on the following areas:

- Agronomics.
- Economics.
- Marketing.
- Institutional.
- Quality control standards for markets (International and domestic).

Project 2.1.2: Implement training at identified project sites

Based on priority sites identified under Strategic Cluster 1, training should be implemented at priority project sites. Training should be provided by service providers appointed for this task or by suitably trained extension workers.

Project 2.1.3: Support coursework development at tertiary institutions

There are a number of tertiary institutions actively involved in essential oil research (e.g. University of Pretoria, Tshwane University of Technology, Cedara Agricultural College). Building on existing research, funding should be made available for the establishment of formal courses on essential oil production, distillation and marketing.

Thrust 2.2: Extension and mentorship support

Project 2.2.1: Develop extension support systems to community grow out models

Provide regular extension visits to community project sites by government extension services or service providers commissioned for this task

- Provision of training and mentorship to producers and extension services.
- Ensure effective participation and support to production by national and provincial departments of agriculture to increase the production base.
- Establish a database of service providers who can provide support and expert advice on essential production and distillation.

Project 2.2.2: Commission essential oil farmers / specialists to act as mentors to provide support to emerging farmers

Many farmers are prepared to share their knowledge with other farmers. This sharing of knowledge, along with many trials and errors have been the main way through which knowledge has been generated in the production of essential oils. Information portals should be developed where farmers

can share information and knowledge by asking and answering questions in relation to essential oil production.

Commissioning of specialists to provide extension and mentorship support, where such expertise cannot be provided by government extension services should also be considered. This kind of support can fulfil two functions. Firstly, project beneficiaries are provided with the necessary skills when it is required and secondly, local extension services can participate in these sessions so that their own capacity to support production can be developed.

Project 2.2.3: Provide support to large scale cultivation of Rosemary and Lemon Grass (Species specific project)

Rosemary and Lemon Grass are a high volume crops with a relatively stable demand for the oil. They are also relatively easy essential crops to grow. They can also be sold fresh or dried if oil prices are particularly low. While margins are low, these crops can generate income and cashflow. Large scale cultivation should be supported in suitable areas.

Project 2.2.4: Support expanded cultivation of Rose Geranium at sites currently producing rose geranium

Rose geranium is a high value crop that has good income generation potential expanded cultivation at existing sites should be supported and developed through extension, training and mentorship.

Thrust 2.3: Information dissemination

Project 2.3.1: Commission the compilation of guideline manuals and documents on essential oil production and markets

Information should be provided in the following themes and formats:

- Production and processing guidelines / manuals, which consider (1) general agronomic principles and practices and (2) the peculiarities of producing different crops.
- Market information, including:
 - Growth and development characteristics of local and international markets.
 - Export opportunities.
 - Consumer and retail trends.

As new information and research becomes available, these should be updated and disseminated to sector stakeholders. The use of websites, smartphones and other similar technologies should be made to ensure that information is timeous and reaches the target audience. It is necessary that NGOs and other agencies (e.g. SEOBI) play a role in providing this information to resource poor farmers.

Project 2.3.2: Compile a database of specialists who can provide information and support

A database of specialists in the fields of essential oil production, processing and marketing should be compiled. These specialists can then be approached for information and expertise as and when it is required. An initial database of essential oil stakeholders who can provide support is provided in Appendix 6.

Project 2.3.3: Establishment of information sharing platforms and portals

Centralised platforms for information sharing should be established. A dedicated website for essential oils in South Africa should be established, under the auspices of the essential oil association. This should include basic information on essential oil production in South Africa and market information for buyers and sellers. Discussion groups and blogs should also be established to provide a forum through which information can be shared between essential oil stakeholders.

Farmers' days and field days should be held for sharing of information and demonstration of better practices and technologies in essential oil production should be held on a regular basis.

Cluster 3: Market support and development

Thrust 3.1: Develop market linkages to improve market access

Project 3.1.1: Work with market intermediaries to facilitate market access and fair pricing

Market intermediaries have a good understanding of markets and quality requirements for oils. Intermediaries should be commissioned to assist with market access, advise on pricing structures and to identify key quality constraints related to local oils and to and measures to improve oil quality. Intermediaries should also be engaged to determine the feasibility of establishing supply agreements with growers. Mitigation of risks for non-delivery of oils would need to be considered, for example through providing management support to projects to ensure production.

Project 3.1.2: Register with the DTI as a sector association to take advantage of export promotion schemes

There are a number of existing support schemes provided by thedti that can assist with developing market linkages. These include:

- SA National Pavilion and Individual exhibition scheme programmes for export promotion should be accessed and utilised by essential oil producers. There are three tiers or levels of development that are recognised:
 - Export councils. These are usually well established sectors that regularly market their produce overseas (e.g. citrus). The establishment of an export council requires agreement on the part of producers and processors through a consultative process as a fee based on production value is charged for the marketing services provided by the council.
 - Sector associations are a less formal export promotion structure, but can still access export support programmes provided through thedti.
 - Joint Action Groups (JAG) generally consists of a small number of producers who wish to access specific foreign markets.

Considering the relative underdevelopment of the sector, an export council is not warranted at this stage. It is recommended that a sector association be the mechanism used to access support from thedti for export promotion.

Other investment promotion agencies, such as provincial agencies and Tradepoint services should also be included in developing markets and export promotion.

Project 3.1.3: Approach local manufacturers to obtain preferential supply agreements.

The DTI should work closely with the essential oil association in engaging with local markets (local and multinational processors) to understand what their requirements are for essential oils (e.g. quality, volumes and price, timing, etc.). This information would assist in increasing local supply (import substitution) to processors and develop local markets. However, before such agreements can be reached, it is important that consistency of supply and quality by local producers is enhanced.

Project 3.1.4: Support organic and fair trade certification at project sites.

Certification requirements for fair trade and organic are quite onerous, particularly for emerging farmers due to the costs and high record keeping requirements necessary for certification. While certification is difficult, emerging growers are ideally placed to obtain certification for both of these practices, considering traditional agricultural practices and that project owners are farm workers. This can result in significantly improved market access and price for oils. Organic and fair trade certification should be established with existing emerging farmers who are successfully growing essential oil crops.

It is important to draw on expertise / experience of existing initiatives that are accessing these markets through certification and a study should be commissioned to understand the requirements of certification and the challenges that need to be overcome to access these markets.

Quality standards of the markets should also be investigated so that production in South Africa can work towards meeting these quality standards.

Project 3.1.5: Investigate new markets for *Lippia javanica* value added products (species specific)

Species Specific Project: *Lippia javanica*:

- Commission marketing and formulations specialist to work with the CSIR to determine market entry points for *Lippia* value added products (Mosquito repellent, fungicide – citrus, insect repellent – fruit).
- Establish and implement marketing plan for viable value added products.
- Understand regulatory and permit requirements for expanded cultivation and processing of *Lippia javanica*.

Project 3.1.6: Production and marketing of Lemon Balm (species specific)

Species Specific Project: *Lemon Balm*

- Market demand currently exists for lemon balm (Jessica Tuebes, pers comm.), which is a high value essential oil crop.
- Provide potential growers with information on production protocols, expected yields and market prices to encourage production of lemon balm.
- Proposed sector association and CSIR should work together in developing this.

Project 3.1.7: Branding and marketing strategy for *Buchu* (species specific)

Species Specific Project: *Buchu*

- *Buchu* has until recently enjoyed a long and sustained demand, but recently, market prices have dropped significantly. A renewed marketing effort to profile and increase demand for *Buchu* is

required. This endemic crop has become the focus of research efforts in Australia and branding of South African Buchu should be developed to maintain market share. This should consider initiatives such as Proudly South African and Indigenous Knowledge Systems and Intellectual Property Rights.

Thrust 3.2: Meeting Market Requirements

Project 3.2.1: Commission local intermediaries to provide information on international market requirements for essential oils and facilitate market access

This will provide a benchmark to assist producers to understand and comply with international quality standards and should be conducted in conjunction with intermediaries and export promotion initiatives.

Cluster 4: Knowledge generation through targeted research

Thrust 4.1: Agronomic and post-harvest research

Project 4.1.1: Conduct research on optimising production related to key agronomic considerations

Cultivar selection and breeding - Research should focus on breeding of cultivars that are suited to the local climates and maximise biomass production and oil yields. Trials should be conducted at agricultural research institutions, such as the ARC, DAEARD (e.g. Cedara and other research stations) as well as field trials conducted in partnership with commercial essential oil producers.

Water - Research should be conducted on water applications in relation to yield (biomass production), oil yield and oil quality. Both dryland and irrigated production research should be conducted. Where irrigation is not available, production strategies in relation to water use efficiency should be investigated.

Weed management – this is a critical area of agronomic research and has been highlighted by a number of informants as a significant input cost and, if not done effectively, results in lowered oil yield (due to plant competition) and quality (due to contamination) and, in some cases, crop failure. Weed management should consider plant spacing and configuration, cultural practices (e.g. ploughing, discing, hand weeding, mulching) and, where conventional production is occurring, the use of herbicides.

Pest and disease management – certain pests and disease need to be identified early and controlled to maintain yield throughout the production cycle, particularly during the latter parts of the production cycle (bearing in mind that harvesting usually continues for 3 – 5 years).

Soil amendments – soil pH and available plant nutrients are the two key considerations and optimal nutrient management for both conventional and organic production soil management requires research.

Project 4.1.2: Research post-harvest technologies for yield and quality

There are a number of factors which affect oil yield that are directly related to harvesting and distillation practices. In terms of actual harvesting, timing of harvest (season, time of day), weather conditions and harvesting methods (e.g. hand harvesting or mechanical) and transport (distance,

time between harvesting and distillation) all have an effect on oil yield and quality. The second consideration is distillation methods and construction of distillation unit (including operating costs and energy requirements). Finally, the third consideration is packaging and storage of distilled oil.

Some research has been conducted on these factors, but more information is required. Research should initially focus on gathering information from existing producers who are willing to share information and knowledge in relation to the considerations outlined above. This will provide an initial overview of what the optimal practices and distillation configurations are to increase efficiency in processing. Based on this information, research themes should be developed that focus on key areas where information is not available.

Processing should consider the technical and infrastructural requirements to maximize oil yield and quality, while keeping distillation costs as low as possible. Areas where research is required include:

- Configuration of distillation units to optimize oil yield and quality.
- Energy efficiency – energy costs make up a large proportion of distillation costs and are particularly relevant in the context of increasing energy costs and reducing carbon footprint.
- Use of cheaper materials to reduce capital costs of distillation.
- Process management / engineering – conduct research into techniques that maximize oil yield and quality.

Project 4.1.3: Develop quality control systems along the value chain

Building on research outlined above, quality management systems, starting with the selection of the correct cultivars for planting, agronomic practices and through to distillation technologies should be compiled and disseminated. Systems should focus on minimising costs and maximising quality.

Project 4.1.4: Support post-graduate research at tertiary institutions

Funding should be made available to post graduate researchers to enhance research output for essential oils. There are a number of institutions currently conducting research (e.g. TUT, UP, Cedara) who should be supported to conduct further research on essential oil production.

In addition to tertiary education, agricultural research institutions (such as the Agricultural Research Council, NRF, etc.) should be engaging in research that supports essential oil production. Collaboration and research partnerships with other countries that have well developed essential programmes (e.g. Australia, India, Brazil) Australia has similar climatic conditions, diseases and pests to South Africa; India and Brazil governments have well developed systems for supporting small farmers; other African Countries are also supporting essential oil production. Lessons need to be learnt from these countries and applied in South Africa.

Tertiary institutions, such as agricultural colleges (this is where many extensionists are trained) and universities must develop research and training programmes on essential oil production. Such research can inform decision-making at a national level. Also, research farms of Agricultural Colleges and universities should be used for research and training purposes.

Project 4.1.5: Conduct research into sustaining biomass and oil yield of Rose Geranium over the production cycle (species specific)

Species Specific Project: *Rose Geranium*

- Significant opportunities exist for Rose Geranium markets, as China which is a major producer of Rose Geranium is scaling down production.
- Rose Geranium has a strong demand globally and is the most cultivated plant in South Africa for essential oil, but is a challenging crop in terms of sustaining biomass and oil yield over its five year production cycle. Agronomic research and information on Rose Geranium production is necessary to overcome these production challenges, such as:
 - Research into varieties that perform better over a five year cycle
 - Fertiliser and water applications to sustain production
 - Other agronomic factors (disease, harvest intervals, etc.) that affect long term biomass production.

Thrust 4.2: New essential oil crops and product research and development

Research and development should find ways to produce higher volumes of good quality oil and is divided into two broad thematic areas

Project 4.2.1: Investigate potential for new indigenous essential oil crops

South Africa has a wealth of indigenous biodiversity. Given the number of plant-based remedies that are used for traditional healing purposes in South Africa, it follows that there exist opportunities for the commercialisation of new crops from essential oils can be extracted. Research institutions should be commissioned to investigate indigenous plants that have potential for essential oil production. It is recommended that following research process be followed:

- Review existing literature and knowledge to identify plant compounds that have potential medicinal, cosmetic or similar benefits.
- Compile a list of plants that have potential for oil extraction.
- Conduct trial extractions, isolate compounds and determine effectiveness for proposed use.
- Conduct safety and toxicity tests.
- Determine market potential for identified plant extracts.
- Engage with processors to commercialise products.

This research should be conducted in close collaboration with the commercial sector as they will ultimately be responsible for commercialising the identified oils. The CSIR and DST are involved in investigating new essential oil crops through their Social Spending programmes and the DST's Indigenous Knowledge Systems (IKS) programme can assist with these investigations. It is important that the knowledge generated is firstly protected for all South Africans by using Access and Benefit Sharing and Indigenous Intellectual Property Rights Legislation. Secondly, it is important that this information is made available in the Public Domain for use by South African entrepreneurs. Key stakeholders include the ARC, Universities, the NRF, Agricultural Colleges and Sector Specialists.

This project should seek to identify and commercialise five new indigenous crops.

Project 4.2.2: Investigate existing essential oil crops which have potential for commercialisation in South Africa

Species Specific Project: *Rose Damascene*

- This is a new crop, which has yet to be produced at a commercial scale in South Africa.
- The DST and CSIR are investigating the potential of this crop and should be supported to conduct cultivation trials in suitable areas to determine feasibility of production in terms of biomass production, oil yield and markets through their agronomic demonstration projects.

Project 4.2.3: Research and development of value added products

Programmes that provide support to small enterprises for the development of value added products should be established. Natural perfumery, cosmetics, personal care products and toiletries represent opportunities, given the growth of these sectors locally and internationally. Programmes should focus on identifying and supporting entrepreneurs in the following areas:

- Skills and training.
- Processing equipment and technology.
- Access to markets.

It is proposed that a competitive grant fund be made available for entrepreneurs who are seeking to establish new product lines or access new markets for their produce, particularly export markets. The grant funding providers should work to establish research partnerships with institutions that are currently investigating or supporting the development of new formulations for entrepreneurs, such as Chemcity (SASOL), Brunel, Tshwane University of Technology, CSIR and the Innovation and Technology Network.

7 IMPLEMENTATION PLAN

7.1 Overview

An overview of the implementation framework is provided in Table 2 below. Table 3 provides the detailed implementation plan. There is a time progression, focussing initially on primary production, moving on to primary processing and marketing as represented in Figure 4 below.

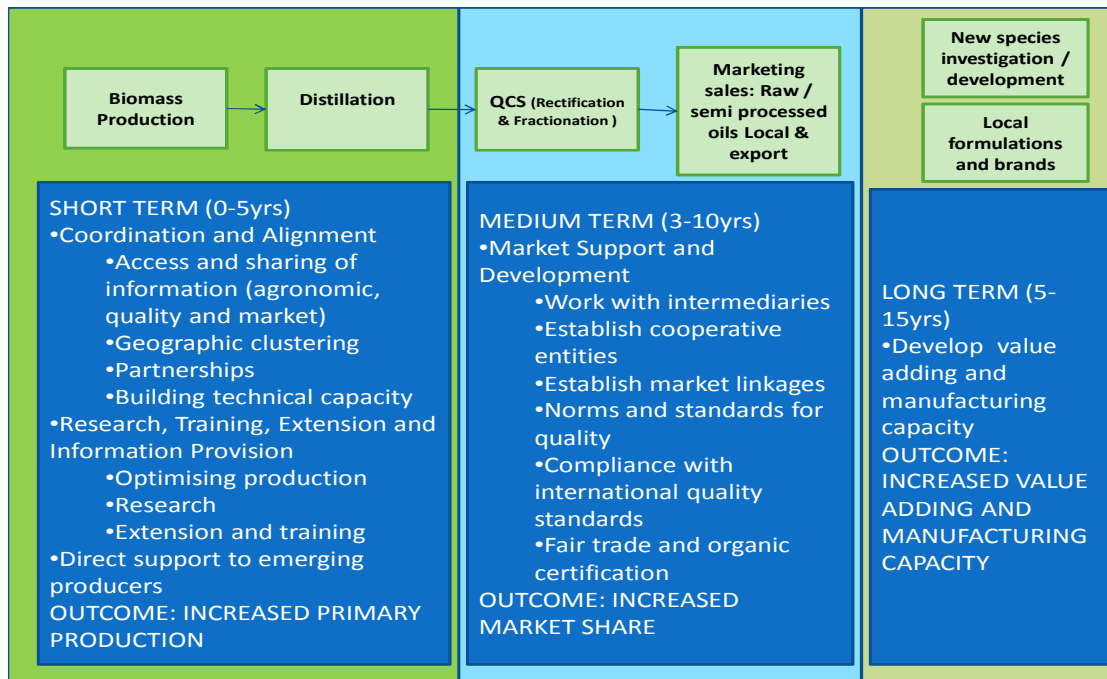


Figure 4: Proposed timeframes and activities for the development of the essential oil value chain.

Table 2: Overview of implementation framework

STRATEGIC CLUSTER	STRATEGIC THRUSTS	PROJECTS / ACTIVITIES	TIMEFRAME
CLUSTER 1: COORDINATION AND ALIGNMENT	THRUST 1.1: ESTABLISH A REPRESENTATIVE STAKEHOLDER COALITION TO SUPPORT THE DEVELOPMENT OF THE SECTOR	1.1.1: Facilitate establishment of sector association	S/T
	THRUST 1.2: FACILITATE PARTNERSHIPS BETWEEN SECTOR STAKEHOLDERS	1.2.1: Facilitate partnerships between sector stakeholders.	S/T
		1.2.2: Facilitate partnerships between commercial and emerging farmers	S/T
	THRUST 1.3: PROVIDE COORDINATED SUPPORT TO GROW THE SECTOR	1.3.1: Compile a database of projects and support being provided	S/T
		1.3.2: Achieve geographic clustering of production and support	S/T
		1.3.3 Support priority projects	
CLUSTER 2: CAPACITY DEVELOPMENT FOR SECTOR GROWTH	THRUST 2.1: TRAINING	2.1.1: Develop training materials for essential oil production	S/T
		2.1.2: Implement training at identified project sites	S/T
		2.1.3: Support coursework development at tertiary institutions	S/T
	THRUST 2.2: EXTENSION AND MENTORSHIP SUPPORT	2.2.1: Develop extension support systems to community grow out models	S/T
		2.2.2: Commission essential oil farmers / specialists to act as mentors to emerging farmers	S/T
		2.2.3: Provide support to large scale cultivation of Rosemary and Lemon Grass (<i>Species specific project</i>)	M/T
		2.2.4 Support expanded cultivation of Rose Geranium at sites currently producing Rose Geranium (<i>Species specific project</i>)	S/T
	THRUST 2.3: INFORMATION DISSEMINATION	2.3.1: Commission the compilation of guideline manuals and documents on essential oil production and markets	M/T
		2.3.2: Compile a database of specialists who can provide information and support and commission to provide support where necessary	S/T
2.3.3: Establishment of information sharing platforms and portals		M/T	

STRATEGIC CLUSTER	STRATEGIC THRUSTS	PROJECTS / ACTIVITIES	TIMEFRAME
CLUSTER 3: MARKET SUPPORT AND DEVELOPMENT	THRUST 3.1: DEVELOP MARKET LINKAGES TO IMPROVE MARKET ACCESS	3.1.1: Work with market intermediaries to facilitate market access and fair pricing	M/T
		3.1.2: Register with the DTI as a sector association to take advantage of export promotion schemes	M/T
		3.1.3: Conduct an investigation of potential to supply oils to local manufacturers	M/T
		3.1.4: Support organic and fair trade certification at selected project sites	M/T
		3.1.5: Investigate new markets for <i>Lippia javanica</i> value added products (<i>Species specific project</i>)	M/T
		3.1.6: Production and marketing of Lemon Balm (<i>Species specific project</i>)	M/T
		3.1.7: Branding and marketing strategy for Buchu (<i>Species specific project</i>)	M/T
	THRUST 3.2: MEETING MARKET REQUIREMENTS	3.2.1: Commission research into international market requirements (particularly quality) for essential oils	M/T
		4.1.1 Conduct research on optimising production related to key agronomic considerations	M/T
CLUSTER 4: KNOWLEDGE GENERATION THROUGH TARGETED RESEARCH	THRUST 4.1: AGRONOMIC AND POST-HARVEST RESEARCH	4.1.2: Research post-harvest technologies for yield and quality	S/T
		4.1.3: Develop quality control systems along the value chain	M/T
		4.1.4: Support post-graduate research at tertiary institutions	M/T
		4.1.5: Conduct research into sustaining biomass and oil yield of Rose Geranium over the production cycle (<i>Species specific project</i>)	M/T
		4.2.1: Investigate potential for new indigenous essential oil crops	L/T
	THRUST 4.2: NEW ESSENTIAL OIL CROPS AND PRODUCT RESEARCH AND DEVELOPMENT	4.2.2: Investigate existing essential oil crops which have potential for commercialisation in South Africa	L/T
		4.2.3: Research and development of value added products	L/T

7.2 Implementation Framework

The proposed implementation framework is provided in Table 3 below.

Table 3: Detailed implementation plan

Key Actions	Expected Outcomes	Roleplayers	Resources	Assumptions	Timeframes
<i>Strategic Cluster 1: Coordination and Alignment</i>					
<i>Improve coordination and cooperation between public and private stakeholders in the essential oils sector to facilitate growth and development of the sector</i>					
Thrust 1.1 Establish a representative stakeholder coalition					
<i>Establish an essential oils association to:</i> <ul style="list-style-type: none"> • <i>Foster cooperation between value chain roleplayers.</i> • <i>Articulate stakeholder needs.</i> • <i>Support the development of the sector.</i> 					

Key Actions	Expected Outcomes	Roleplayers	Resources	Assumptions	Timeframes
<p>1.1.1 Facilitate establishment of sector association</p> <p>Appoint a facilitator to facilitate the establishment of the association and a mandate for representatives of different value chain participants.</p> <p>Conduct an initial workshop with stakeholders to obtain buy in from stakeholders and mandates for value chain representatives</p> <p>Establish terms of reference / mandate for to establish the association</p> <p>Make conditional grants available as an incentive to establish the sector association</p> <p>Conduct follow-up workshops to reach agreement on structure and purpose of association</p> <p>Formalise and MOU between government and the sector association.</p>	<p>Effective and sustained coordination and cooperation between essential oil stakeholders</p> <p>Reduced duplication</p> <p>Improved integration of value chain development</p> <p>Information sharing and dissemination</p>	<p>DAFF, DTI, Essential Oil Stakeholders</p> <p>DRIVER: DTI</p>	<p>Office with equipment and staff</p> <p>R200,000 (facilitator)</p> <p>R20,000 (venues and catering)</p>	<p>People empowered to make decisions participate in the workshops</p> <p>A willingness to cooperate exists</p> <p>Consistent and committed attendance at workshops</p>	S/T
Thrust 1.2 Facilitate partnerships between sector stakeholders					
<p>1.2.1 Develop partnerships between the private sector and government to grow the emerging essential oil sector</p>	<p>Partnerships between government, private</p>	<p>DAFF, DTI, SEOBI, DST, CSIR, SAEOPA, private sector</p>	<p>Provision of inputs and infrastructure to emerging</p>	<p>Common vision and objectives</p>	S/T

Key Actions	Expected Outcomes	Roleplayers	Resources	Assumptions	Timeframes
1.2.2 Facilitate partnerships between commercial and emerging farmers	sector and communities to grow the sector.	stakeholders. DRIVER: DAFF	farmers in partnership with commercial farmers R10,000,000	between private sector and government	
Thrust 1.3 Provide coordinated support to grow the sector					
<ul style="list-style-type: none"> • <i>Comprehensive database compiled of projects being supported.</i> • <i>Database facilitates identification of support required (agronomic, processing, markets, institutional).</i> • <i>Provide support to projects using internal capacity and service providers.</i> 					
1.3.1 Compile a database of projects and support being provided	Effective and coordinated support to projects	DTI, Essential Oil Association, DAFF and provincial agriculture departments, Local and District Municipalities, DRIVER: DAFF	Internal capacity to be utilised. Commissioning of specialists to provide support to projects R3,000,000 (qualified mentors / researchers) R6,000,000 (project support)	Roleplayers provide information timeously Assumption that identified actions to assist producers can be resourced and implemented	S/T
1.3.2 Achieve geographic clustering of production and support	Focussed support in geographic regions				
1.3.3 Support priority projects	A verifiable dataset of projects An action plan for support to be provided to projects				

Strategic Cluster 2: Capacity Development for Sector Growth

Provide training, extension support and disseminate information to essential oil producers to achieve increased production.

Thrust 2.1 Training

- The development of training courses that will build capacity of producers and processors to increase output of high quality essential oils.*

<p>2.1.1 Develop training materials for essential oil production</p> <ul style="list-style-type: none"> Short courses. Coursework development at tertiary institutions. Field-based coursework. <p>Implement training at identified project sites Support coursework development at tertiary institutions</p>	<p>Practical and relevant training in for essential oil production and processing</p> <p>Training builds capacity of producers to produce oils more efficiently.</p>	<p>Research institutions DAFF, DTI Specialists in essential oils</p>	<p>Researchers, coursework development specialists R500,000 Implementation of training by trainers R5,000,000</p>	<p>Training capacity exists Training can be implemented on site</p>	<p>S/T</p>
<p>2.1.2 Implement training at identified project sites.</p> <p>Provision of training at priority project sites</p>					
<p>2.1.3 Support coursework development at tertiary institutions</p>					

Thrust 2.2 Extension and mentorship support					
<ul style="list-style-type: none"> • <i>Provide extension officers training in essential oil production and processing.</i> • <i>Develop mentorship programmes with stakeholders who are providing support to essential oil production.</i> 					
<p>2.2.1 Develop extension support systems to community grow out models</p> <p>DTI to engage with DAFF to understand if and how extension support to essential production can be enhanced</p> <p>Identify agricultural extension offices in the geographic clusters who are interested in supporting essential oil production (preferably volunteers) and provide training.</p> <p>Engage with specialists and NGOs providing support to assist with building capacity of extension services.</p>	<p>State extension support to essential oil production is enhanced</p> <p>NGOs providing support to extension officers and to projects.</p>	<p>DTI, DAFF, Provincial Agricultural Departments</p> <p>NGOs,</p> <p>Sector association</p>	<p>Training and mentorship capacity</p> <p>Training to extension services</p> <p>R800,000 (Training of trainers)</p> <p>R5,000,000 (on-going extension and mentorship support)</p>	<p>DAFF and DTI work together in developing and implementing training and mentorship</p>	<p>S/T</p>
2.2.2 Commission specialists, NGOs and producers to provide extension support where this cannot be provided through the state					
2.2.3 Support large scale cultivation of rosemary, chamomile and lemon grass for local and international markets.					
2.2.4 Support expanded cultivation of Rose Geranium at sites currently producing Rose Geranium					
Thrust 2.3 Information dissemination					
<ul style="list-style-type: none"> • <i>Develop mechanisms and processes for the effective sharing and dissemination of information.</i> 					

<p>2.3.1 Compile production and processing guideline manuals for commercially produced crops</p> <p>Compile marketing and market information guidelines and documents</p> <p>Compile marketing and market information guidelines and documents</p>	<p>Information is readily available for identified essential oil species</p> <p>Queries related to essential oil production can be answered</p> <p>New techniques and technologies are shared with growers</p>	<p>DTI, DAFF, Provincial Agricultural Departments</p> <p>NGOs,</p> <p>Sector association</p>	<p>Development of manuals</p> <p>Website development (hosted by association)</p> <p>R350,000</p>	<p>Funding secured for information dissemination</p>	<p>S/T</p>
<p>2.3.2 Establish a database of specialists in essential oil production, processing and marketing who can provide information and expertise on selected subjects.</p>					
<p>2.3.3 Develop centralised information sharing platforms / hubs, through a dedicated website</p> <p>Host farmers days and workshops to share information on new techniques and technologies</p>					
<p>Strategic Cluster 3: Market Support and Development</p>					
<p><i>The objective is to enhance availability of market information and access to markets by essential oil producers</i></p>					
<p>Thrust 3.1 Work with intermediaries to facilitate improved market access at a fair price</p>					
<ul style="list-style-type: none"> • <i>Develop relationships with intermediaries to enhance market access and consistent price structuring</i> 					

<p>3.1.1 Work with market intermediaries to facilitate market access and fair pricing</p> <p>State and sector association to engage with intermediaries to better understand market opportunities and expected prices. Facilitate agreement on structures and processes for marketing and improved market information to producers.</p>	<p>New markets identified</p> <p>Perceptions of unfair pricing addressed</p>	<p>DAFF, DTI</p> <p>Sector Association</p> <p>Intermediaries</p>	<p>Internal resources)</p>	<p>Intermediaries are willing to engage and share information</p> <p>Good markets exists with strong market linkages</p>	<p>S/T</p>
<p>3.1.2 Establish market linkages through existing trade promotion schemes</p> <p>Make us of existing trade promotion programmes to enhance access to markets by producers</p> <p>Use the sector association as a formal structure through which to access export support programmes</p>	<p>Improved market access and information</p>	<p>Sector Association</p> <p>DTI</p> <p>DRIVER: SECTOR ASSOCIATION</p>	<p>Internal Resource</p>	<p>Sector association recognised by export promotion schemes</p>	<p>M/T</p>
<p>3.1.3 Approach local manufacturers to obtain preferential supply agreements</p> <p>Government and private sector stakeholders to engage substitute local oils for imported oils used in manufacturing in South Africa.</p>	<p>Enhance access to markets by local producers, particularly for local processing</p>	<p>DTI</p> <p>Processors</p> <p>Sector Association</p> <p>DRIVER: DTI</p>	<p>Internal resources</p>	<p>Manufacturers will consider purchasing locally produced essential oils</p>	<p>M/T</p>

<p>3.1.4 Support organic and fair trade certification at project sites</p> <p>Facilitate certification to producers to achieve improved market access</p> <p>Engage with organic and fair trade certifiers and specialists to understand certification requirements</p> <p>Appoint specialists to evaluate projects for compliance and develop certification where feasible</p>	<p>Enhance market access and better price to producers</p>	<p>Certifiers, sector association</p> <p>DTI, DAFF</p> <p>DRIVER: DTI</p>	<p>Evaluation of projects and provision of support and capacity to be certified</p> <p>R2,500,000</p>	<p>Producers can meet certification requirements</p>	<p>M/T</p>
<p>3.1.5 Investigate new markets for Lippia javanica value added products</p> <ul style="list-style-type: none"> • Commission marketing and formulations specialist to work with the CSIR to determine market entry points for Lippia value added products (Mosquito repellent, fungicide – citrus, insect repellent – fruit). • Establish and implement marketing plan for viable value added products. • Determine regulatory and permit requirements for expanded cultivation and processing of <i>Lippia javanica</i>. 	<p>Achieve increased market share for Lippia products</p> <p>Lippia branded and selling well as an insect repellent and fungicide.</p>	<p>DTI, DAFF, CSIR, DST</p> <p>DRIVER: DTI</p>	<p>Marketing and branding specialist to develop products/formulations, promote brand and enter market</p> <p>(R450,000)</p>	<p>Sufficient oil can be produced to meet market demand</p>	<p>M/T</p>

<p>3.1.6 Production and marketing of Lemon Balm</p> <ul style="list-style-type: none"> Market demand currently exists for lemon balm (Jessica Tuebes, pers comm.), which is a high value essential oil crop. Provide potential growers with information on production protocols, expected yields and market prices to encourage production of lemon balm. Proposed sector association and CSIR should work together in developing this. 	<p>10ha of lemon balm producing essential oils</p>	<p>Sector association, DAFF, DTI, Sector Body, Tuebes CC</p> <p>DRIVER: DAFF</p>	<p>Infrastructure and technical support for 5 years</p> <p>R2,500,000</p>	<p>Market remains good</p>	<p>M/T</p>
<p>3.1.7 Brand and marketing strategy for Buchu</p> <ul style="list-style-type: none"> This endemic crop has become the focus of research efforts in Australia and branding of South African Buchu should be developed to maintain market share. This should consider initiatives such as Proudly South African and Indigenous Knowledge Systems and Intellectual Property Rights. 	<p>Enhance market share achieved through branding and labelling</p>	<p>Sector association, DTI, SABS, SANAS, Buchu producers</p> <p>DRIVER: DTI</p>	<p>Marketing and branding specialist</p> <p>(R500,000)</p>	<p>Quality standards can be developed</p>	<p>M/T</p>
<p>Thrust 3.2 Meeting market requirements</p>					
<ul style="list-style-type: none"> <i>Establish minimum quality standards for South African essential oils to brand and profile SA essential oils.</i> 					

<p>3.2.1 Commission local intermediaries to provide information on international market requirements for essential oils and facilitate market access</p> <p>State to engage with SANAS, SABS and sector association to develop standards for SA essential oils</p>	<p>Enhance market access through establishing quality standards</p>	<p>Sector association, DTI, SABS, SANAS</p>	<p>Research to develop quality standards</p> <p>R450,000</p>	<p>Quality standards can be developed</p>	<p>M/T</p>
<p>Strategic cluster 4: Knowledge generation through targeted research</p>					
<p><i>Research efforts focussed on increasing production, to develop new oils and identify new value added products to secure increased market share</i></p>					
<p>Thrust 4.1 Agronomic and post-harvest research</p>					
<p>Conduct research on three key areas, namely</p> <ul style="list-style-type: none"> • <i>Production.</i> • <i>Primary processing.</i> • <i>Markets.</i> 					
<p>4.1.1 Conduct research on optimising production related to key agronomic considerations</p> <p>Engage with value chain roleplayers through the association to determine specific research required in the following thematic areas:</p> <ul style="list-style-type: none"> • Cultivar selection and breeding. • Water. • Weed management. • Pest and disease management • Soil management. 	<p>Enhance research output to increase volume and quality of oils being produced</p>	<p>Sector association, Research institutions (ARC, Universities, Universities of Technology, CSIR, NRF, etc.)</p> <p>DRIVER: DST</p>	<p>Funding for research</p> <p>R5,000,000 (over three years)</p>	<p>Research institutions see value in conducting essential oil research</p>	<p>M/T</p>

<p>4.1.2 Research post-harvest technologies for yield and quality</p> <p>Post-harvest technologies (harvesting methods, transport, distillation, packaging and storage)</p> <p>Need to consider energy efficiency, process management, engineering and configuration of distillation units.</p>	<p>Enhanced quality of essential oil distilled in South Africa</p>	<p>Sector association, Research institutions, processors (ARC, Universities, Universities of Technology, CSIR, NRF, etc.)</p> <p>DRIVER: DST</p>	<p>Funding for research and dissemination of information</p> <p><i>R3,000,000 over three years</i></p>	<p>Sufficient primary production is achieved to justify post-harvest research</p>	<p>M/T</p>
<p>4.1.3 Develop quality control systems along the value chain</p>	<p>Quality management systems and protocols for the value chain are developed</p>	<p>Sector association, Research institutions, processors (ARC, Universities, Universities of Technology, CSIR, NRF, etc.)</p> <p>DRIVER: DTI</p>	<p>Funding for research and dissemination of information</p> <p><i>R1,000,000 over three years</i></p>	<p>Cooperation and information sharing between value chain role players.</p>	<p>M/T</p>
<p>4.1.4 Support post graduate research at tertiary institutions</p> <p>Support to research at tertiary institutions; research guided from needs identified by the sector.</p>	<p>Research partnerships to optimise essential oil production</p>	<p>Sector association, Research institutions, processors (ARC, Universities, Universities of Technology, CSIR, NRF, etc.)</p> <p>DRIVER: DST</p>	<p>Funding for research</p> <p><i>R3,000,000 over three years</i></p>	<p>Post graduate students are interested in researching essential oils</p>	<p>M/T</p>

<p>4.1.5 Conduct research into sustaining biomass and oil yield of Rose Geranium over the production cycle (species specific)</p> <ul style="list-style-type: none"> Rose Geranium has a strong demand globally and is the most cultivated plant in South Africa for essential oil, but is a challenging crop in terms of sustaining biomass and oil yield over its five year production cycle. Agronomic research and information on Rose Geranium production is necessary to overcome these production challenges. Significant opportunities exist for Rose Geranium markets, as China which is a major producer of Rose Geranium is scaling down production. 	<p>Increased production of Rose geranium</p>	<p>ARC, DST, CSIR, DAFF. DRIVER: DAFF</p>	<p>Sites for controlled experimental trials (ARC) (R1,500,000)</p>	<p>Research capacity exists to conduct the research</p>	<p>M/T</p>
<p>Thrust 4.2 New essential oil crops research and development</p>					
<ul style="list-style-type: none"> <i>Make use of South Africa's indigenous knowledge and biodiversity to create economic opportunities.</i> 					
<p>4.2.1 Investigate potential for new indigenous essential oil crops</p> <p>Conduct research into plant based remedies that can be commercialised; identify those with potential and commercialise</p>	<p>The development of new essential oil products</p>	<p>DEA, DAFF, DTI, DST CSIR</p>	<p>Funding for research R15,000,000 (over 10 years)</p>	<p>Commercial products that are acceptable to the market can be developed</p>	<p>L/T</p>

<p>4.2.2 Investigate commercial planting of Rose Damascene</p> <ul style="list-style-type: none"> • This is a new crop, which has yet to be produced at a commercial scale in South Africa. • The DST and CSIR are investigating the potential of this crop and should be supported to conduct cultivation trials in suitable areas to determine feasibility of production in terms of biomass production, oil yield and markets through their agronomic demonstration projects. 	<p>Commercial production protocols for Rose Damascene developed</p>	<p>DST, CSIR, DAFF DRIVER: DST</p>	<p>Production Trials (R3,000,000)</p>	<p>South African climate suitable for production</p>	<p>M/T</p>
<p>4.2.3 Research and development of value added products</p> <p>Provide entrepreneurs with</p> <ul style="list-style-type: none"> • Skills and training • Processing equipment and technology • Access to markets <p>Make competitive grant funding available and establish partnerships with organisations involved in value addition</p>	<p>Increase in small and medium business producing value added essential oil products</p>	<p>DTI, Chemicity, TUT, CSIR, Innovation and Technology Network DRIVER: DTI</p>	<p>Funding to support manufacturing R10,000,000</p>	<p>Entrepreneurs are looking to expand into value added essential oil products</p>	<p>L/T</p>

7.3 Species specific strategies

Species specific strategies for each of the essential oil plants listed in the project terms of reference have been identified and are included in the strategy chapters above. For clarity, these strategies have been summarised in this section. A number of general principles are provided that should apply to any essential oil cultivation project are provided below. The sections thereafter provide an overview of the species specific strategies.

- There should be a clear and verifiable business plan for production.
- Markets for the crop must be identified.
- Organic and fair trade production is preferred.
- Funding support for extension and mentorship for a minimum period of three years is necessary (weekly visits in year 1; bi-monthly in year 2; monthly in year three).
- Motivated and committed project participants.

7.3.1 Rosemary: Support large scale production

Rosemary is an essential oil plant that is versatile and has a great number of end uses. The oils are used primarily in the Food and Flavouring and Cosmetics sector, but are also used in Pharmaceuticals and Aromatherapy. In addition to this, the fresh and dried form of the herb can also be marketed. Support large scale cultivation. Rosemary is not a high value crop when compared with other oils such as Buchu or Lemon Balm. However, the local and international demand for Rosemary oils is stable and steady as a result of its versatility.

Large scale expansion of production should be supported to establish a critical mass of Rosemary essential oil production. This would allow sufficient volumes to enter into formal agreements in relation to the supply of this oil to local and international manufacturers.

7.3.2 Lemon Grass: Support large scale production

Lemon grass is similar to Rosemary in that it has a number of different end uses and the fresh plant parts can also be used. There is a sustained and steady demand for lemon grass oil locally and internationally. Lemon grass is a, fast growing, high yielding essential oil plant, with few weed problems due to its vigorous growth. The plant does have high water requirements and should be planted in warmer, high rainfall climates (E. Cape, KZN, Mpumalanga).

Large scale expansion of production should be supported to establish a critical mass of Rosemary essential oil production. This would allow sufficient volumes to enter into formal agreements in relation to the supply of this oil to local and international manufacturers.

7.3.3 Chamomile: Expand on a trial basis

Chamomile is a relatively slow growing plant that is susceptible to weed infestations due to its low growth habit. This means that it does have relatively high labour requirements both for weed control and for the harvesting as it is a low growing plant. Another advantage of chamomile is that it has low fertiliser requirements, can grow in clay soils and is effective at extracting nutrients from the soil. Chamomile is considered a profitable crop as a result of the challenges associated with its cultivation. Chamomile is often grown in countries with low labour costs, which make it difficult for many countries to compete.

Production of chamomile should be expanded on a trial basis at selected sites being developed by SEOBI and other organisations that have identified essential oil production as an economic development opportunity.

7.3.1 Rose Geranium: Research and expand production at existing sites

Geranium is a high value crop that has a strong demand globally, with the potential to make good profit. In addition, markets opportunities currently exist as China, a major producer of Rose Geranium has recently been affected by drought and has been scaling down production of Rose Geranium. However, it is a difficult crop to grow as it is susceptible to pests and disease and requires frequent weeding, which makes it a labour intensive crop. It is also difficult to sustain production throughout the recommended five year ratoon cycle. In light of this, two actions have been identified for Rose Geranium.

Expand current production

Expansion of production at sites where Rose Geranium is currently grown is the recommended strategy for this essential oil. This expanded cultivation should be aided by close mentorship and extension support for production.

Another strategy identified for Rose Geranium is that of researching how to best sustain biomass production over the course of the production cycle of five years.

Conduct research into sustaining biomass and oil yield over the production cycle

It is necessary to conduct additional research into sustaining biomass and oil yield of Rose Geranium over the five year production cycle. This research should be undertaken as action research with existing producers of Rose Geranium.

7.3.2 Lippa javanica: Develop and market value added products

Research conducted by the CSIR on *Lippia javanica* has found it be an effective mosquito repellent. There are also indications that the essential oil of Lippia is also an effective insect repellent for use in fruit crops and also has potential application as a fungicide in the storage of organic citrus crops. The proven efficacy of Lippia in repelling mosquitos should be taken into a marketable product. Currently candles are produces for this purpose. This range should be expanded to other products, such as sprays and topical compounds. This requires the services of a marketing and branding specialist to brand and package these products and take them to the market.

The marketing and formulations specialist should build on existing research conducted by the CSIR to identify market entry points for Lippia value added products and take these products to market.

There are also regulatory and permit requirements associated with cultivation of Lippia. The CSIR can make this information available to prospective producers.

7.3.3 Lemon Balm: Expand cultivation

Lemon balm is a highly sought after and valuable essential oil. It is a potentially profitable crop that is labour intensive due to the relatively slow growth and low growth habit. The low oil yield of the crop also means that management levels must be high to ensure optimal yields of Biomass and Oil. Potential growers of lemon balm oil should be provided with the relevant information on the

production of Lemon Balm. This should include production protocols, expected yields and market prices and guarantees for prices to encourage the production of Lemon Balm.

It is recommended that the sector association, intermediaries, CSIR and essential oils projects should work together in developing this.

7.3.4 Buchu: Rebranding and marketing

Buchu essential oil has, until recently, enjoyed high demand worldwide. It is a highly sought after and valuable oil. South Africa is big exporter of Buchu. The plants from which Buchu oil is extracted are endemic to South Africa, in particular, the Western Cape.

Recent research efforts in Australia investigating the cultivation of Buchu indicate that South Africa will be facing competition for one of its' long standing mainstay essential oil crops. Consequently, it is necessary to engage in branding and labelling exercises to profile South African Buchu Oil.

Use of other instruments to protect South African Buchu, such as Indigenous Knowledge, Intellectual Property and the International Convention on Biodiversity should also be considered to maintain the South African Buchu Brand.

7.3.5 Rose Damascena: Production trials

Rose Damascena is a versatile plant with a number of end uses, which sustain demand for the crop. Rose Damascena is a highly sought after and valuable oil. However, little is known about the cultivation of Rose Damascena in South Africa and there is currently no commercial scale cultivation.

The DST and CSIR are investigating the potential of this essential oil crop. Support to research efforts to investigate the potential of this crop in South Africa should be provided. Specifically, cultivation trials in suitable areas should be conducted to determine the feasibility of production in terms of biomass production (soils, pests, yields, etc.), oil yield and quality, and markets through their agronomic demonstration projects.

7.4 Existing projects to be considered for support

Table 4 below provides a list of current projects, identified during the situational analysis that would benefit from support to expand cultivation. Where possible, specific species being cultivated have been listed in the table.

Table 4: Essential Oil Projects

Project Name	Location	Species Grown	Organisation (s) involved	Status
Genadenberg	Piketberg, Western Cape	Agathosma betulina (Buchu)	DST / CSIR	Established
Onseepkans	Pofadder, Northern Cape	Rose Geranium	DST / CSIR	Established
Pella	Pofadder, Northern Cape	Rose Geranium	DST / CSIR	Established
Hi Hanyile	Giyani, Limpopo	<i>Lippia javanica</i> , Lemon grass	DST / CSIR	Established
Kwanobuhle	Uitenhage, Eastern Cape	Rose Geranium, <i>Lippia javanica</i>	DST / CSIR	In development
Manjolo	Mpumalanga	Rose Geranium	DST / CSIR	Established
Cacadu	Eastern Cape	Rose Geranium, Melissa, Lavender Chamomile, Buchu	ECDC, SAEOPA	Pilot
Elandskraal	Mpumalanga	Rose Geranium	DST / CSIR	In expansion phase
KwaNgwanase	Manguze, KwaZulu-Natal	Rose Geranium	DST / CSIR	Early development
Letsemeng	Petrusburg, Free State	Roman Chamomile, German Chamomile Rose Damascene, Peppermint	DST / CSIR	Pilot phase
Mount Frere	Mount Frere, Eastern Cape	Roman Chamomile, German Chamomile, Rose Damascene, Peppermint	DST / CSIR	Pilot phase
Stemora	Limpopo	Geranium	SEOBI and Goldex	Collapsed due to infighting
Sekhukune	Limpopo	Geranium, Moringa, lemon grass	SAEOPA	Pilot phase
Dyseldorp United Trust	Western Cape	Liquorice	DST / CSIR	Collapsed
Ya Rona	Limpopo	Geranium (organic)	SEOBI	Not stated
Vukuzenzele	Eastern Cape	Not stated	SEOBI	Not stated
Mayibuye Works		Not stated	SEOBI	Not stated
Rinono Green Garden I Trust	Limpopo	Not stated	SEOBI	Not stated

Project Name	Location	Species Grown	Organisation (s)	Status
Fanyakazi Dira tiro agricultural cooperative	North West	Not stated	SEOBI	Not stated
Thlolwe	North West	Chamomile, Geranium	African Rose	Stalled due to problems with establishment
African Rose Rustenburg	North West	Geranium	African Rose	Operational
Babane	North West	Geranium	SEOBI	Unsure
Maluba	Limpopo	Geranium	SEOBI	Unsure
Vaalwater	Limpopo	Geranium	SEOBI/ CSIR	Operational
Rooiwal	Gauteng	Geranium, rosemary, lemon grass, lavender, tea tree, Moringa, mint, chamomile	TSHWABAC, SAEOPA, Agric Farm Development (AFD)	Planning
Moretele	Gauteng	Geranium, rosemary, lemon grass, lavender, tea tree, Moringa, mint, chamomile	TSHWABAC, SAEOPA, Agric Farm Development (AFD)	Planning
Melmoth Zululand area	KZN	Geranium	WINROCK, SAEOPA	Training and Fully operational
Vogelstruisnek	North West	Rosemary, Geranium, tea tree, lippia,	TSHWABAC, SAEOPA, Agric Farm Development (AFD)	Planning
Molatedi,	North West	Geranium, rosemary, basil	TSHWABAC, SAEOPA, Agric	Planning

Project Name	Location	Species Grown	Organisation (s)	Status
			Farm Development (AFD)	
Bulungula	Eastern Cape	Lemon Grass	SAEOPA, ARC, SEOBI	Operational
Nqila	Eastern Cape	Lemon Grass, Geranium, rosemary	ARC	Operational
Ncora	Eastern Cape	Geranium, rosemary	ARC	Operational
Vukuzenzele	Melmoth, KZN	Rose Geranium	KZN DEDT	Dormant
Goldex projects	Polokwane	Geranium, Moringa, rosemary, lavender, basil, parsley	SAEOPA	Operational and Trials
Moringa Project	Polokwane	Rose Geranium, Moringa	EU / Private	Scaling up
Amatole essential oils project in Eastern Cape	Eastern Cape	Lavender ,Rose, Geranium, mint, Melissa, rosemary, tea tree	ECDC / Commercial Farmers / SAEOPA	Operational
Ugu Essential oil project	KZN	Tea tree	SAEOPA	Operational
Nkandla	KZN	Geranium	OXFAM/ CSIR/ SAEOPA	Partly operational
Welkom essential oil project	Free State	Not sure yet	SAEOPA	Planning and training phase 1
Elgin Essential Oil Project	Western Cape	Geranium, Erioccephalus, Lavender, rosemary	SAEOPA	Operational
Carolina essential oil project	Mpumalanga	Lavender, rosemary. Sage, chamomile, thyme,	SAEOPA	Pilot
Badplaas essential oil project	Mpumalanga	Geranium	SAEOPA	Operational
Nelspruit essential oil project	Mpumalanga	Geranium	SAEOPA	Operational

Project Name	Location	Species Grown	Organisation (s)	Status
Tonga castor oil project in Mpumalanga	Mpumalanga	Castor oil	SAEOPA	Scaling up
Northern Cape essential oil project	Northern Cape	Geranium	SAEOPA	In planning phase
Bela Bela essential oil project	Limpopo	Geranium	SAEOPA	In planning phase

8 FUNDING AND INSTITUTIONAL ARRANGEMENTS FOR DELIVERY

8.1 Funding

It is recognised that limited funding resources are available to support the growth of the sector. Soft funding is defined as funding which generates knowledge and skills. In other words, does not directly result in the establishment of physical products, but is necessary for generating the capacity to develop products. The focus of these research areas is on research, extension and market development to increase the production, quality and sale of essential oils.

Funding resources should be allocated to areas which will leverage sector growth. These are the strategic thrust areas and are categorized as soft and hard funding.

Soft funding – this focuses on research, extension and market development to increase production and sales of essential oils.

- Research and development.
 - Production — this should focus on increasing areas under production, enhancing biomass and oil yield and build the competitiveness of the sector.
 - Processing – this should focus on improving distillation technology and knowledge to improve the quality of oil distilled by producers.
- Capacity building.
 - Industry training, technology transfer, communication – training, capacity building and information dissemination is the foundation on which increased production is based.
- Market development.
 - The profiling of South African essential oils and the development of increased market share (e.g. through National Pavilions, Trade Missions, Tradepoint Linkages, etc.).

Hard funding – the provision of infrastructure and direct support to emerging producers. Infrastructure and inputs should be provided to small growers who are successfully producing economically viable areas under essential oils. The establishment of fixed infrastructure up front is not supported. Projects should be provided access to mobile distillation units during start-up until a critical mass of production is reached that will justify the establishment of a permanent distillery and associated infrastructure.

8.1.1 Market development

It is necessary that consistency of production and quality is achieved before investment in profiling and marketing South African Essential Oils is made.

8.1.2 Hard funding

The provision of direct support (i.e. infrastructure and inputs in addition to training and capacity building) to emerging producers who are successfully growing essential oils is important. Projects should be provided with access to mobile distillation units during start-up until a critical mass of production is reached that will justify the establishment of a permanent distillery and associated infrastructure. It is recommended that the SEOBI approach be utilised for direct support to production projects. This does not mean that SEOBI should be exclusively mandated to roll out

essential oil production projects. Certainly SEOBI plays an important role, however there are other organisations (private and public) that are supporting essential oil production projects and should be supported to continue to do so (see Table 4). In this regard, the database of projects will assist with identifying the type of support that needs to be provided to different projects.

Ultimately, it is not the model that makes a difference to the success of the project, but it relates to the support being provided and the presence of leadership and accountability within the project structure that will determine the success of the project.

8.1.3 Funding support for essential oil projects

There are a range of different essential oil initiatives being supported by a range of organisations. These can be summarised as follows:

- DST / CSIR – these projects focus on development and testing of grow out models for essential oils. The mandate of these organisations in the context of essential oils is to develop the protocols so that they may be rolled out by government departments (e.g. DAFF and its provincial counterparts, provincial economic development departments and municipalities), parastatals (e.g. ARC, SEOBI) and the private sector. The role of the DST / CSIR is therefore primarily in the research domain.
- SEOBI – this organisation has developed a thorough approach for implementing essential oil projects and is currently rolling out a number of essential oil projects. SEOBI is following a sound process, but success in production would be enhanced if there was greater capacity to provide regular mentorship and extension support to projects.
- Provincial and Local Government – provincial departments of Agriculture, Social Development and Economic Development (e.g. KZNDEDT and ECDC) and a number of Municipalities are also supporting essential oil production projects.
- NGOs – a number of NGOs are also supporting essential oil production (e.g. Winrock Foundation, Bulungula Trust).
- Private Sector – commercial farmers and other business organisations are also supporting essential oil production projects.
- Manufacturers and value adding support – these organisations provide support for the development of formulations and value added products. For example, Chemicity is funded by SASOL to develop value added cosmetic and pharmaceutical products, among other things. Other private sector stakeholders include Tuebes CC, Biomox, Afriplex, African Rose Oil, Innovation and Technology Network (a full list of stakeholders in different parts of the value chain are provided in Appendix 6).
- Representative stakeholder coalition – the sector association recommended in the strategy will require funding support to provide services to its constituents.

Considering the different sectors that are supporting essential oil production, a range of incentives and funding schemes identified in the situation analysis (Chapter 6) are suggested for supporting different organisations, based on their mandates (See Table 5)

Table 5: Funding opportunities for different essential oil programmes

Fund, programmes and incentives that can fund essential oil development.	DST / CSIR	SEOBI	Prov & Local Government	NGOs	Private Sector	Manufacturers and value adders	Representative Stakeholder Coalition
DTI: Sector Specific Assistance Schemes							
DTI: Export Marketing and Investment Assistance							
Small Enterprise Development Agency							
DTI: Cooperative Development Schemes							
DAFF / PDAs: Comprehensive Agricultural Support Programme							
DST: Research, Development and Innovation							
DST: Socio-economic partnerships							
Provincial Department of Agriculture Programmes							
Provincial Investment Promotion Agencies							
Provincial Economic Development Departments							
National Development Agency							
Development Bank of South Africa (DBSA)							
Industrial Development Corporation (IDC)							

8.2 Institutional arrangements for delivery

It is widely acknowledged that community based essential oil projects have to date not been very successful. As detailed in the strategy, lack of effective group structures, lack of good leadership and the age profile of participants in these projects are on-site challenges affecting the success of these projects. From a broader perspective, limited coordination and cooperation between agencies (government, parastatals and private sector) supporting essential oil projects is a major concern, compounded by a lack of resources and capacity to provide effective mentorship and extension support to growers to scale up primary production. In addition to this, marketing remains a challenge, with a high degree of distrust between producers and intermediaries who buy and sell essential oils.

To address these concerns, a conceptual framework for institutional arrangements that highlights key organisations and their roles in supporting essential oil production is provided below. This section simply lists the major stakeholders in the sector. A full list of the agencies, organisations and departments involved in essential oils is provided in Appendix 6. The conceptual framework is represented pictorially in Figure 5.

8.2.1 Role of Government

Within the National Sphere of Government, there are three important Departments in facilitating the development of the Sector, whose roles are as follows:

- **Department of Trade and Industry.** The DTI should lead the strategy and be responsible for overall implementation. This does not necessarily mean that the DTI should be involved in funding research or primary production, but it should be providing oversight for the overall implementation of the strategy and ensure that the activities of the different departments are aligned and coordinated. In addition to this, the DTI funds SEOBI who are responsible for projects being implemented on the ground. SEOBI should be provided with the necessary human resources and funding to deliver on production projects based on realistic goals that are focussed on delivering economically and socially sustainable enterprises.
- **Department of Agriculture, Forestry and Fisheries.** DAFF and its provincial counterparts in particular, are mainly responsible for supporting primary production through the provision of inputs, extension support for primary production and to a lesser extent, some processing and marketing. The national and provincial agriculture Departments should train extension officers to provide support to projects and work closely with other organisations supporting such projects (e.g. Municipalities, other provincial Departments and NGOs). Provincial Departments of Agriculture should maintain databases of projects which can be used to inform a national database of essential oil projects and support, which should be maintained by the DAFF.
- **Department of Science and Technology:** The focus of the DST is on research and technology development. Research needs articulated through the sector association, private sector and government should be channelled through the Department and research institutions should be commissioned to conduct the research.

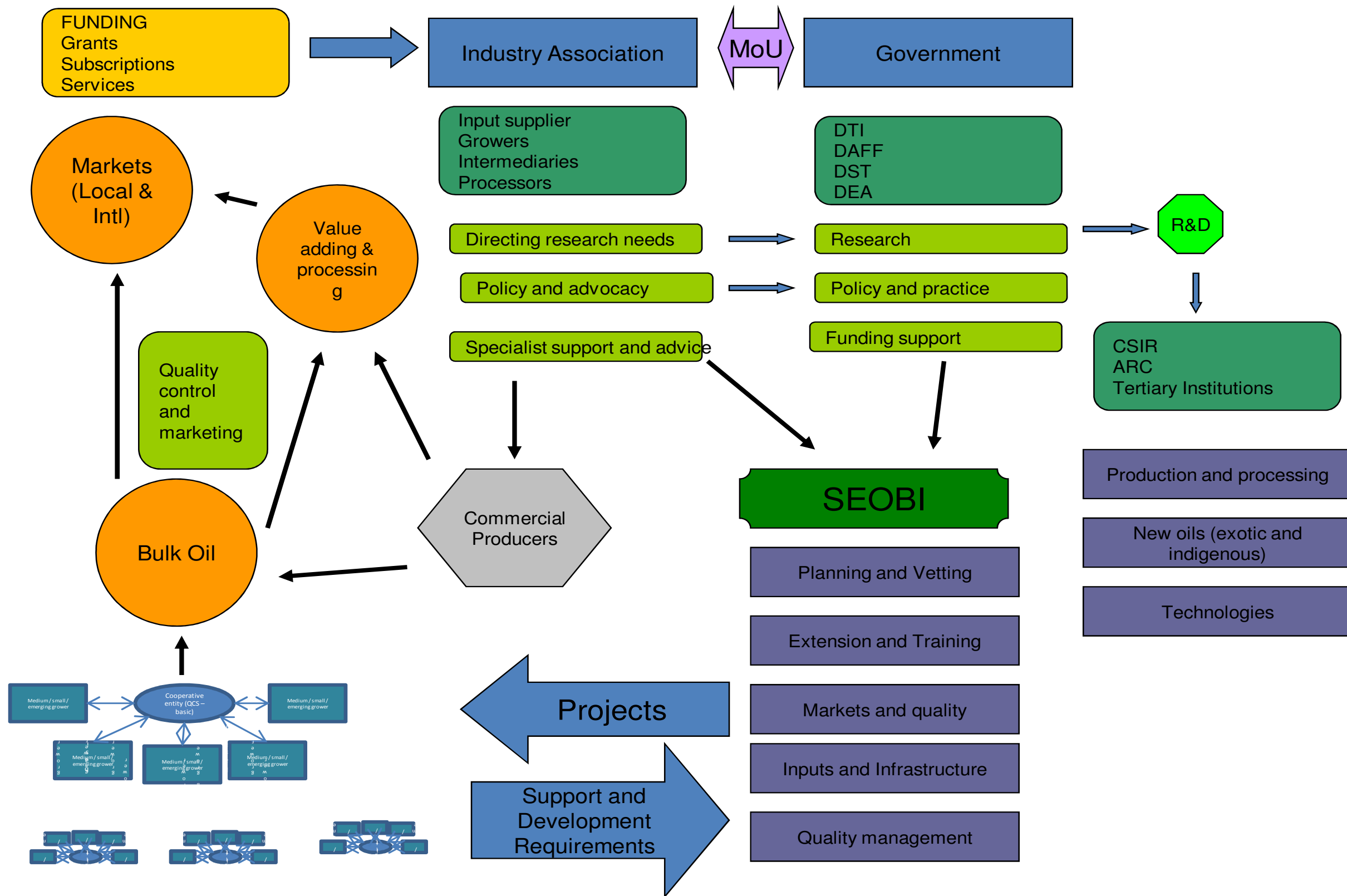


Figure 5: Conceptual framework for institutional arrangements and funding

While these three departments are the main roleplayers, there are other departments who will also play a key role, such as:

- The Economic Development Department and its provincial Economic Development Departments.
- Trade and Investment Organisations.
- Development Finance Institutions.

8.2.2 Role of parastatals and related organisations

Two important organisations at a national level who have been involved for some time in supporting essential oil production are the CSIR (in partnership with the DST) and the Seda Essential Oils Business Incubator (SEOBI). Other organisations who have been working on essential oils include the Agricultural Research Council and the Eastern Cape Development Corporation (ECDC),

The primary role of the CSIR is research and development and their role in developing the essential oil sector should remain as such; the CSIR research in essential oils should continue and research outputs should be shared with all relevant stakeholders to allow them to make informed decisions.

SEOBI is mandated to roll out the implementation of essential oil projects on the ground. This is a role SEOBI should continue to do with the support of various national and provincial government agencies as well as from the private sector.

Other project sites being supported by parastatal organisations include the Agricultural Research Council and the Eastern Cape Development Corporation, among others.

8.2.3 Role of the private sector and sector association

Clearly private sector stakeholders have an important role to play in supporting and developing the essential oil sector. There is a wealth of knowledge that has been developed in relation to the production, distillation and marketing of essential oils. In addition, there are specialists with expertise developed from years of involvement in the sector. These stakeholders should be encouraged to participate in advising and supporting essential oil projects.

As indicated in Section 5.1.1 and Figure 3, the sector association will be made of various constituents and be driven by sector stakeholders in partnership with government Departments and parastatals. The sector association should in the long term be able to fund itself through subscriptions, but in the short term would need to be supported with grant funding and be paid for the provision of services and advice to essential oils stakeholders to ensure economic viability in the short term.

9 DISCUSSION

The development of the essential oils industry depends on a number of factors, and a key factor is improved co-operation and trust among stakeholders. There is a need to introduce measures aimed at fostering co-operation among stakeholders, especially between farmers/producers and intermediaries and between government, producers and emerging farmers. These measures should take cognizance of the fact that the level of trust between these groups is currently low. The following measures need to be viewed and fostered:

- Development of a coalition of stakeholder organisations.
- Regular information sharing among stakeholders is critical to the improvement of co-operation among essential oils industry stakeholders. The stakeholders, under the leadership of the government, need to consider using various information sharing tools such as a newsletter. In addition, information-sharing platforms such as a dedicated internet website to facilitate information exchange may be introduced. The newsletter may even be posted on the internet site.
- Organising conferences, meetings and workshops on the development of this industry on a regular basis.

Information from the situation analysis indicates that there are approximate 2000ha of land on which essential oils are currently grown. This is made up of 1900ha of commercial production and 100ha of small / emerging growers. This area should be increased significantly to facilitate effective market penetration. Support and incentives should be provided to expand the cultivation and processing of oil to 10 000ha by 2018, equating to a 2 000ha increase per annum. This will not be achieved without good and mutually beneficial partnerships with existing commercial producers and significant resources will need to be allocated to this.

Specialisation is critical to the development of the essential oils industry. Since it is difficult for owners of emerging farming businesses (and other related SMMEs) to farm and to identify and secure markets, there is a need to encourage essential oils industry stakeholders to focus on their main activities. For example, emerging rural community farmers should not be encouraged to spend time trying to find or establish markets because the processes involved in establishing contact with established industry players can be cumbersome and extremely difficult to achieve.

Re-establishing and/or strengthening the link between producers/growers and intermediaries (i.e. traders, buyers or exporters), and introducing measures to protect the former from possible exploitation by the latter should be implemented. These measures include encouraging intermediaries to make price structures more transparent. Such measures will lead to the reduction in attempts by small producers to export their essential oils directly to international buyers. As already pointed out, small producers generally do not have sufficient production capacity to guarantee a stable supply of good quality essential oils to international markets, such as established international fragrance houses.

There is a need to improve the bargaining power of farmers to enable them to negotiate prices with intermediaries.

Research is critical to the development of the South African essential oils industry. The Improvement of primary production is among the research topics that require the urgent attention of the relevant stakeholders. The topics that need to be researched include the increase in production and production volumes, and improving cultivars and the general quality of plants.

The step-wise implementation of the strategies contained in this document will lead to the strengthening of the sector from an institutional and technical perspective. From an institutional perspective it can be expected that a more coordinated and integrated approach to projects will be achieved, resulting in increased success of projects. From a technical perspective an improvement in biomass production and oil yield will result from the recommended research initiatives. Improved institutional and technical developments will result in the expansion of production, better support to the sector, improved market access and facilitate the growth and development of the sector.