PART 4 – AROMA CHEMICALS DERIVED FROM ESSENTIAL OILS

5 CURRENT STATE OF SOUTH AFRICAN ESSENTIAL OIL INDUSTRY

5.1 Agricultural Stakeholders

Once again one needs to distinguish the South African bulk essential oils (e.g. citrus and eucalyptus) from the smaller essential oils e.g. (geranium, lavender and chamomile). The former is largely self-sufficient and established. For example, the eucalyptus oil industry in South Africa is about 70 years old and commands some 5% of the world market. The latter is relatively new in South Africa. Historically, it was the CSIR that pioneered the growth of the industry in the smaller essential oils. The CSIR's stated aim was to promote higher value industrial crops that would have rural development potential.

The growth of the South African essential oils industry has been largely haphazard. The industry is very fragmented. It is being driven by two main factors. Firstly, commercial farmers are seeking alternative high value crops to diversify risk and increase profitability. Secondly, rural communities, Government and NGO's are seeking high value crops that can be produced on a co-operative basis thereby creating jobs in economically depressed rural areas.

The South African essential oils industry comprises over 100 small producers of which only a dozen, or so, of the commercial farmers and a couple of community projects are regular producers. Most oil production is in the Limpopo and Mpumalanga regions, Kwazulu-Natal and the Cape.

A key indicator of the current size of the South African industry is the number of operational distillation facilities. According to the South African Essential Oil Producers Association (SAEOPA) there are approximately 33 commercial stills in operation in South Africa, most of which are in the range from 250kg to 500kg units. Most of these stills would be considered to be of sub- economic size.

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Table 23: Estimated Number of Commercially Operational Stills[57]

Province	No. Stills
Eastern and Western Cape	8
Kwa-Zulu Natal	7
Mpumalanga	8
Free State	2
Gauteng	5
Northern Province	3
TOTAL	**33**

Historically, the CSIR has had the most experience with the South African essential oils industry. The Agricultural Research Council (ARC), on the other hand, has had little focused involvement, only getting involved in isolated instances when individual researchers have had the inclination and the budget. The CSIR has met with mixed success in the promotion of the industry. One of the difficulties that the CSIR has faced is balancing its role as a publicly funded research institution and its responsibility to be partially self-funded. On the one hand CSIR is a publicly funded institution from which research should be made available to the public. On the other hand, the CSIR is expected to generate supplementary funding from other sources (mostly of a private nature). This latter position requires that they adopt a proprietary stance with regards to information and research outputs in order to have a basis for transacting with the private sector. This ambiguity has affected the industry negatively (causing mistrust and lack of exchange of information). Many farmers and other stakeholders have resented having to pay consulting fees to the CSIR to access information on the essential oil industry. The South African Essential Oils Producer Association (SAEOPA) was formed in 2000 as an alternative to the CSIR as a source of know-how for current and potential producers.

SAEOPA began in Mpumalanga, but since 2003 has a branch in each of Kwazulu-Natal and the Western Cape. SAEOPA is a voluntary association, with a board, and administered on a part-time basis using small annual subscriptions (currently, R250.00 per member). SAEOPA was established as an alternative to the CSIR and Biosys Plant Extracts, which were the original promoters of the industry in South Africa. It appears that some producers resented the fact that the CSIR, as a public research institution, was charging farmers commercial consulting rates for the disclosure of basic industry information. SAEOPA's stated objective is to support its members, who primarily comprise producers of essential oils. By pooling their information and experiences, the members hope to promote the industry and the

[57] Information from SAEOPA

interest of their members. SAEOPA supports its members throughout the value chain, beginning with the dissemination of information on agricultural issues and ending with marketing matters. With regards to the latter, representatives of SAEOPA have attended various trade missions sponsored by Department of Trade and Industry (DTI). These trade missions are largely considered to have been successful with the prospect of orders being placed. However, in the process, SAEOPA has identified several issues that need to be addressed in order to secure market access:

- The need to consolidate production in order to supply sufficient quantities with consistency. The volumes are required in order to get serious international attention.
- The need to have basic testing facilities (e.g. Gas Chromatograph) in order to test oils and to be able to give assurances with regards to quality and characteristics.

As a general observation, the study has revealed that there have been many disparate projects and studies conducted by various institutions at various levels (e.g. CSIR nationally and the Provincial Departments of Agricultural regionally). Furthermore, the National Botanical Institute (NBI) has information regarding South African flora and biomes and the National Department of Agriculture has the details of soil profiles and climatic conditions. There are also centres of knowledge developing, such as at Cedara Agricultural College in Kwazulu Natal, where local commercial producers are interacting with researchers. On the whole, information is considered to be available but not readily accessible. There is a need to catalogue and consolidate the information gathered by public institutions over the years.

The largest immediate player in the South African essential oil market is Biosys Plant Extracts (Pty) Limited. Biosys began as a collaborative effort between CSIR and a British company, Biosys Limited in 1998. It was the recognition of the constraints of entering the international market that caused the CSIR to form an alliance with the British company Biosys Limited. Out of this alliance Biosys Plant Extracts (Pty) Limited (a foreign owned South African company) was formed. Biosys Plant Extracts still works closely with CSIR, but is now wholly independent of the CSIR. Biosys acts as a technical and marketing agent for essential oil producers, thereby meeting the issues identified by SAEOPA (mentioned above). Given the difficulties of “breaking into” the international market, Biosys has strategically focused on established essential oil markets and has steered clear of experimenting with “new” oils. Biosys’ focus is predominantly on the agricultural component of the value chain as it has identified this as a critical component for meeting the requirements of international buyers. In particular, Biosys assists producers with obtaining Organic Certification. As an intermediary, Biosys endeavors to match successful producers to pre-identified buyers, thus ensuring consistent and reliable markets for its clients (both the buyers and producers). This relational approach places inflexibility on the market but benefits those who have made the investment and have secured the market. Biosys currently has some 50 commercial farmers as clients, of which less than half are producing commercial quantities.[58] Biosys also works very closely with Teubes (Pty) Limited. Although operating independently, the CSIR continues to be interested in essential oil production where this involves rural development projects (e.g. Giyani in the Limpopo Province, growing Lippia and Geranium), generally this oil is sold to Biosys.

Other players include Bio Africa, which is predominantly a national agricultural consultancy to farmers and communities in Southern Africa. Bio Africa also has its own distillation facilities in Gauteng and a network of international buyers.

On the whole, most essential oil producers sell their oils to Biosys or to Teubes (Pty) Limited for export or sell directly into the local market, mostly for aromatherapy applications.

5.2 Indigenous Essential oils

There is a distinct industry in indigenous essential oils. However, besides Buchu, this segment is very small and predominantly focused in the Cape. The Buchu industry is fragmented with both cultivated and wild harvested plant material being used. There is also a lot of illegal harvesting taking place. The Buchu industry is considered to be facing a crisis in that demand is high and is pressing prices so high that substitute products may well be sought. There are quite a number of small indigenous essential oil producing companies, the most prominent of which is Grassroots Natural Products (Pty) Limited. The indigenous essential oils market is also tied in with the broader industry for plant extracts, for example Afriplex (Pty) Limited is predominantly involved in teas (Rooibos and Honeybush) and tinctures, but also deals with essential oils derived from the Cape fynbos. Most indigenous essential oils are either sold in small quantities directly to select buyers in Europe and the US or to Teubes (Pty) Limited. The indigenous essential oil industry in South Africa is primarily a cottage industry.

The exploitation of indigenous plant material holds some interest for rural development. Those indigenous plants that are wild harvested are often harvested by rural communities, either on their own land or that of a commercial farmer (who then shares in the revenue). There are a number of projects being undertaken, for example Buchu cultivation under the auspices of Cape Nature Conservation, to take these rural communities into the new cultivation projects as a means of rural development and upliftment. This process of moving towards cultivation will ensure the long term sustainability of these industries and enable rural communities to create wealth from indigenous knowledge. The CSIR has continued its involvement with essential oils (separate from Biosys) to the extent that this involves the

[58] Information from website (www.biosys.co.za) and Dr Learmonth.

cultivation of indigenous plant material (eg. Lippia javonica is being grown by a community at Giyani for use as an insect repellant).

5.3 Secondary Beneficiation and Marketing

South Africa generally has a strong competence in chemical production. This is evidenced by the availability of "toll" or "contract" manufacturing facilities, used in generic drug and cosmetics manufacture. However, there are a limited number of persons who process essential oils.

It is estimated that Teubes (Pty) Limited, of Gauteng, processes some 90% of the South African essential oils. Oils are bought from producers across South Africa at prices determined in accordance with the quantity and quality. Clive Teubes is a chemist (ex-AECI) with over twenty years in the aroma chemical, flavour and fragrance industry. Clive Teubes acknowledges that it took him over ten years to gain the market knowledge and access he now has. The main market of essential oils is the export market. The difficulty is getting access to the international flavour and fragrance houses. The international companies are looking for producers who will "stay the distance". Therefore relationships take a long time to develop. However, the experience of Teubes is that it is possible to access the large flavour and fragrance houses in Japan, Europe and the USA. In order to do this Teubes has had to develop the capacity (perhaps the best developed in South Africa) to analyse and categorise oils (using analytical chemistry and a panel of organoleptic specialists) and to rectify oils. Great care is taken to meet the technical and organoleptic requirements of the international buyer. With regards to the local market (which is limited), Teubes complements its export business in essential oils with the production of basic synthetic aroma chemicals products (primarily flavours) which Teubes supplies to local manufacturers as import substitutes. Teubes' approach is essentially market driven, responding to market needs making use of Southern African natural resources. Teubes brands itself as an "out of Africa" company and leverages natural resources from other essential oil producing countries (e.g. Madagascar, Kenya, Zambia and Rwanda) in order to broaden its suite of products. The Teubes' plant and equipment are multipurpose and operations are flexible. This allows Teubes to respond to market demands and survive fluctuations.

Afriplex (Pty) Limited, of the Western Cape, is predominantly concerned with producing plant extracts, teas and tinctures. However, it does process some essential oils but these are limited to those coming from the Cape fynbos, in particular Buchu oil. Afriplex is in partnership with Cape Nature Conservation in respect of the Elandskloof community Buchu project. Although Afriplex has focused more on teas and tinctures it does have the commercial capacity to make supercritical extractions (the only commercial scale facility in

South Africa). Afriplex is also considered to be a strong and dynamic company on the basis that it has a wide range of products to offer arising from its niche in the Cape Floral Kingdom.

5.4 Fragrance and Flavour houses - Local

South Africa does have some local formulators. They are predominantly in the food and flavours industries. According to industry estimates there are approximately a dozen such companies, which contribute some 20% of the local production of flavour compounds (approximately R120 million turnover per annum). These include such companies as Cranbrook Flavours, Flavourcraft and Janderee. South Africa produces a negligible amount of fragrance compounds. South Africa has an association, the South African Association of the Flavour and Fragrance Industry (SAAFFI), which represents the interests of the industry. The 27 members represent local and international players, producers and customers.

The majority of flavour and fragrance compounds are imported and used directly by manufacturers. There is a limited amount of formulation in South Africa. In most cases, formualtion processes are performed with the assistance of an olfactory expert. There are only a handful of such people working in South Africa.

Some small local flavour formulators, supplying the snack market in particular, are of the view that the use of “nature identical chemicals” that meet local taste are the future growth areas in the South African food industry, as these chemicals are not subject to the vagaries of agricultural production.

5.5 Fragrance and Flavour houses- International

The local flavour and fragrance market is dominated by the international players. They account for almost all of the fragrance compounds and formulations and at least 80% of the flavour compounds and formulations. The local subsidiaries of the large flavour and fragrance houses such as IFF, Symrise, Quest and Firmenich are part of their group’s global buying strategy. They purchase the best and the cheapest internationally. In this way they are able to give the best prices to local customers even for relatively small quantities. To the extent that they have to formulate for end-users this is done in United States, Europe or Japan. Little to no development is done in South Africa or any other peripheral market. Generally speaking, the local companies do not have any production facilities. They act as sales and marketing centers in the local markets. The local companies may act as a conduit for new flavours or fragrances but all assessments are done overseas. Generally, local producers find that dealing directly with the offshore head office is more effective than interacting with the local offices.

There is one noticeable exception to the foregoing. This is Robertet, a French company with a local subsidiary. Robertet is ranked about number 12 in the world as a flavour and fragrance house with about 1,4% share of the world market. It forms one of the second tier companies with turnover in the range US$200 million to US$500 million per annum. Robertet has over a dozen subsidiaries across the globe (on five continents). It is a fourth generation family business (founded in 1850), headquartered in France and now listed on the Paris bourse. It began predominantly focused on producing natural products but has now diversified into the full range of products relating to fragrances and flavours. Its stated objective is to grow by 10% per annum in order to retain its independence in the market place. Through its subsidiaries it has access to a wide range of natural plant materials and aroma chemicals. Through its diversification strategy it is able to hedge against the risks associated with crop failures and to benefit from access to novel flavours and fragrances. However, all formulations and intellectual property are housed in France. It is understood that Robertet in South Africa is investigating novel flavours from South African flora. If successful, this will form part of Robertet's competitive advantage in the international market. It is reasonable to assume that Robertet has a similar strategy in each geographical area it operates in. South Africa has no companies to compare with Robertet, none having its international reach, product diversity or turnover.

5.6 Governmental Stakeholders

The National Department of Agriculture (NDA) has recently established a department to give consideration to new industrial crops, including essential oils. The post was recently created and an appointment made in July 2004. The direction to be taken by the NDA has not yet been determined. Agricultural Research Council (ARC) reports to the Minister of Agriculture and has as its primary focus research into food-crops. However, the ARC does have a unit in Rustenberg which focuses on industrial crops, particularly tobacco and cotton. On the whole, besides some work on Buchu, conducted in at the ARC unit in Elsenberg, Western Cape, the ARC has not paid much attention to essential oil crops. The ARC has advised that there is no map of the growing regions in South Africa. In order to get information one has to approach various different government departments. Dr Cobus Coetsee, formerly of the ARC, advised that most information is available but not really accessible to the public. For example, the National Botanical Institute (NBI) can provide information on the occurrence of indigenous species and some provincial Agricultural Departments can advise on commercial crops that are grown regionally (with a bias toward food crops). On the other hand, one would need to access the AGIS (the agricultural information system) to find soil and climate charts for the country. The consolidation of basic agricultural information has been recognized as a need by the NDA.

The government institution that has given the most attention to essential oil production is the CSIR. As mentioned above, it was the CSIR's realisation that market access for essential oils was difficult that it established Biosys Plant Extracts (Pty) Limited in conjunction with a British company. The CSIR has done work, together with commercial farmers and communal farmers, on a wide range of oils, including geranium, chamomile, lavender, peppermint and lemongrass. This work is now largely in the hands of Biosys, but CSIR retains an interest where essential oil production is undertaken by rural communities, where CSIR provides consulting services to the project.

The Department of Science and Technology (DST) has also identified essential oil production as an important priority. Its interest in the industry is largely channeled through three initiatives. The first is the work of the CSIR (in particularly community projects, such as Giyani, Driekoppes, Badplaas and Pacaltsdorp). Secondly is the work of the Institute for Natural Resources (At the University of Kwa-Zulu Natal University) in Kwa-Zulu Natal. Thirdly, is through the new chemical sector incubator (Chemin) situated in Port Elizabeth. Chemin has successfully piloted an essential oil project in the Oliver Tambo Municipal area in conjunction with the local authority. The DST has plans to roll-out further community based essential oil programs in the coming year.

The CSIR (Bioprospecting Division), the Institute for Natural Resources (INR) (in KwaZulu Natal) and the ARC and others have various programs in place that are focussed on promoting the commercial exploitation of South Africa's natural resources. Using indigenous knowledge systems as the basis for plant selection, it is possible for scientific and commercial players to identify new entrants into the international flavour and fragrance market. This however is a long term process as the market is conservative. The focus of most of the research is on medicinal uses of indigenous plants and not flavours and fragrances. Funding for such research is inhibited by the current size and profile of the industry.

The DTI, in particular Trade and Investment South Africa (TISA), has a chemical sector desk that has identified essential oil exports as a potential growth area. DTI has been working together with SAEOPA in order to improve the international profile of the South African industry. SAEOPA has sent representatives on trade missions to various trade fairs, with varying degrees of success. SAEOPA has however been unable to leverage its membership subscriptions to form an Export Council. Exports Councils are funded by the Sector Specific Assistance Scheme (SSAS) of the EMIA programme and makes *inter-alia* provision for the operational funding of the Councils. A decision has been made to place a moratorium on the creation of additional Export Councils until such time as more funding is made available for this purpose. Industries that wish to benefit from the other forms of assistance within SSAS may do so by creating a joint action group.

5.7 Grounds of Competitive Advantage

There are no particular inimitable grounds upon which South Africa can claim competitive advantage in the global essential oils industry. However, whenever South African industry representatives are overseas they regularly receive queries about the South African essential oils industry. There appear to be a combination of factors that are in South Africa's favour as a player in the global market. These include:

- Being in the Southern Hemisphere – many of the world's growing regions are in the Northern Hemisphere and the effects of the seasons makes Southern Hemisphere suppliers attractive.
- Having traditionally strong trade links with Europe - as a major importer of flavour and fragrance materials.
- Already being established as a world class agricultural producer in a wide range of products.
- Having a diverse climate with a range of biomes - thus allowing for a good selection of essential oil crops to be grown.
- Having good quality soils – being largely uncontaminated by centuries of exploitation as is the case in the developed world.

The only other grounds of competitive advantage, in the long term, may be access to unique plant materials which could provide a platform for the creation of new markets in which South Africa could dominate. Such domination would need to be based on good science, established trade links and reputation, all of which may be established in advance. Competitive advantage is something that may be created by properly organising the industry and creating the necessary factors for success.