



Local to Global; East or West, Home is Best



## 3<sup>rd</sup> South African Conference on Essential and Vegetable oils

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# 3<sup>rd</sup> South African Conference on Essential and Vegetable oils



BAL; EAST OR WEST, HOME IS BEST



# 1 INTRODUCTION

SAEOPA (Southern African Essential Oils Producers' Association) was established as a non-profit organisation in 2000 to promote essential oils and natural plant products' production, processing, and export.

With the support of the Global Quality and Standards Programme - South Africa (GQSP-SA) project, SAEOPA has grown from strength to strength in its mission to represent and promote the interests of its members and the industry, and to act as a unified and independent mouthpiece for the industry. The support has been wide ranging from assisting SAEOPA put governance structures in place to raising its visibility through the organisation of conferences, webinars and the production of guidance documents for the industry.

The GQSP-SA project is part of the large-scale GQSP programme, which is designed to encourage systematic trade development along specific value chains by strengthening quality infrastructure institutions and service providers, enhancing the compliance capacity of private industry actors, particularly SMEs, and creating a culture of quality among all stakeholders. The GQSP programme is funded by the Swiss Confederation, through the Swiss State Secretariat for Economic Affairs SECO and implemented by UNIDO.

In South Africa, the GQSP-SA project has been implemented in close collaboration with the Department of Trade, Industry and Competition (**the dtic**), to strengthen the quality and

standards compliance capacity to facilitate market access for SMEs in the essential and vegetable oils value chain destined for the cosmetic, food and health markets. With the successful completion of Phase I of the project, Phase II was initiated in June 2023 to unlock the export potential of essential and vegetable oils. Phase II aims to further strengthen the South(ern) African essential and vegetable oils value chain to enable sustainable and competitive market access for Small and Medium Size Enterprises (SMEs).

To date, three South African conferences on Essential and Vegetable Oils have been held successfully with the support of GQSP-SA in collaboration with **the dtic**. The first, titled *Industry milestones, sharing successes and demystifying market requirements*, was in itself a milestone, representing the first-time that industry, academics and government stakeholders came together and joined forces to mobilise the potential of the industry. The second South African Conference on Essential and Vegetable Oils: *New horizons and innovations for the essential and vegetable seed oil industry*, was held in 2022, with the 2024 conference, the third, themed "*Local to Global; East or West, Home is Best*". It brought together over 200 oil producers and stakeholders from across South Africa, Southern Africa and internationally.







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LOCAL TO GLOBAL; EAST OR WEST, HOME IS BEST • 3





## 2 LOCAL TO GLOBAL; EAST OR WEST, HOME IS BEST

The 3<sup>rd</sup> South African Conference on Essential and Vegetable Oils explored a wide range of topics, including navigating global standards and regulations, the crucial role of market access and quality assurance and the importance of agricultural innovation for a sustainable essential and vegetable oils industry. Future strategies for sustainable supply chains covered both wild harvesting and cultivation and featured contributions from representatives from Angola, Namibia and Zimbabwe reporting on production and challenges. The conference was rounded off with presentations and discussions on the importance of leveraging local and global partnerships for collaborative success.

As Ms Preshantie Naicker from the **Department of Environment, Forestry and Fisheries** (DFFE) quoted from SAEOPA's newsletter, the global essential oils market size is USD11 billion and it is planned to be doubled by 2032. South Africa's share is USD678 million, which is only a 0.45% share of world exports. Thus, the conference was an important platform not only for knowledge sharing and networking among key players from government, research and industry, but was also invaluable in equipping attendees with the knowledge to thrive and grow South Africa's share in the dynamic Essential and Vegetable Oils industry.

In welcoming the delegates to the conference, **Dr Tshenge Demana, Chief Director: Technical Infrastructure of the Department of Trade, Industry and Competition (the dtic)**, reiterated the well-known fact that South Africa is the third most biologically diverse country in the world, and that this presents economic opportunities for players in this industry to use natural ingredients in various applications.



He emphasised that developing a sustainable Essential and Vegetable Oils industry will result in rural economic development and increased industrialisation in the country, as has been demonstrated in countries such as Brazil, Indonesia and Morocco.

Dr Demana noted that South African industry stakeholders had recently identified various needs in order to grow this industry. These needs relate to production, procurement of raw materials and packaging, knowledge of regulatory requirements and internationally recognised testing facilities, in addition to understanding of potential markets, pricing, distribution and access to finance. It is in this context, he said, that the GQSP programme initiated a project that is species-based to address the challenges highlighted. The Rose Geranium Development Forum focuses on increased production of good quality Rose Geranium oil, with the aim of the forum to ensure that South Africa is a top player in the production of high quality and high volumes of Rose Geranium oil.

**Mr Daniel Lauchenauer, Head of Swiss State Secretariat for Economic Affairs SECO in South Africa** noted that South Africa is a priority country for SECO's economic cooperation and development programme. In the biotrade industry, he said, SECO supports four complementary projects focusing on various components of the value chain, from production and harvesting to processing and export. These are the Access and Benefit Sharing Project (ABioSA), which is implemented by GIZ to empower SMEs and local communities to benefit from their indigenous plant species; the Swiss Import Promotion Programme (SIPPO), to boost exports; the Swiss-South African Intellectual Property Project (SSAIP), to improve the intellectual property system to stimulate innovation, creativity, and the development of new goods and services; and the Global Quality and Standards Programme (GQSP), which focuses on strengthening the quality and standards compliance capacity, to facilitate growth and market access. Emphasising that promoting a culture of quality in South Africa is important, Mr Lauchenauer quoted W. Edwards Deming: "Quality is everyone's responsibility".





**Dr Diego Masera, UNIDO Representative for Southern Africa**, outlined how the GQSP programme plays a crucial role in leveraging the well-established technical quality infrastructure available in South Africa, to improve market access and promote the competitiveness of local industries on the global stage.

Quality and standards, he said, are critical not only for increasing global trade and commerce but also for boosting regional trade within the context of the African Continental Free Trade Area (AfCFTA). High-quality products that meet international standards can penetrate new markets and build consumer trust, while intra-African trade, supported by harmonised standards, can enhance regional integration, economic diversification, and resilience against global market fluctuations.

**Ms Nnana Makhubu, Chairperson, SAEOPA**, reflected that the 1<sup>st</sup> conference in July 2019, themed *"Industry Milestones, Sharing Successes and Demystifying Market Requirements"*, set the stage to understand and navigate the complex landscape of market demands. Building on this foundation, the 2<sup>nd</sup> conference,

which took place in 2022, focused on *"New Horizons and Innovations for the Essential and Vegetable Oils Industry"* and explored the cutting edge innovations and emerging trends in the industry. This 3<sup>rd</sup> conference, *"Local to Global, East to West, Home is Best"*, underscored valuing and adding value to our local resources, knowledge and expertise, while embracing the opportunities and addressing new challenges in today's global landscape. It was therefore a call to action to harness our unique strengths at home and position South Africa competitively in the global markets.



"Which unique South African essential oil is extracted from a plant known for its use by indigenous communities as a traditional remedy for digestive issues?"

**Answer: Buchu**

**Mr Bernard Bau, Project Manager GQSP - SA Phase II, UNIDO**, concluded by stressing the importance of the National Quality Infrastructure in ensuring technical competence and conformity assessment services in serving this niche market.



**CONFERENCE PROGRAMME DIRECTOR: Dr Elsie Meintjies, UNIDO GQSP-SA**

*Elsie Meintjies is passionate about the role of standards, quality assurance, accreditation and metrology in facilitating trade and building the economy. Since 2011 she has been facilitating technical assistance and support projects for diverse projects ranging from regional trade capacity building, sanitary and phytosanitary measures, to multi-party cooperation agreements. She has held senior and executive positions in South Africa, Botswana and the SADC Secretariat. She was the Chief Technical Advisor for UNIDO, implemented projects in SADC and ECOWAS and is currently working on unlocking the export potential of indigenous essential and vegetable oils.*



**Dr Tshengedzeni Demana, Department of Trade, Industry and Competition (the dtic)**

*Tshenge Demana is a Chief Director at the dtic where he leads the policy and strategic positioning of the Quality Infrastructure entities, namely, National Metrology Institute of South Africa (NMISA), South African Bureau of Standards (SABS), South African National Accreditation System (SANAS) and the National Regulator for Compulsory Specifications (NRCS). He is part of the Department of Trade, Industry and Competition's team supporting the essentials oils project with UNIDO on the back of financial support from SECO. Tshenge is currently a member of the SANAS board of directors and led the first nationwide Energy Efficiency Project that was funded jointly by UNIDO and the Government and implemented through the National Cleaner Production Centre.*



**Mr Daniel Lauchenauer, Swiss State Secretariat for Economic Affairs SECO, South Africa**

*Daniel Lauchenauer has worked in the private, developmental and government sectors, with previous roles including working for Swisscontact on international cooperation projects in Albania, acting as contact point for training in radiation protection for the Federal Office of Public Health, Project Manager International Cooperation at the Institute of Intellectual Property (IPI), and Deputy Head of Economic Development Cooperation in Accra, Ghana. Since August 2019, he has been working as a programme officer at SECO in the Trade Promotion Unit (WEHU) and was appointed Head of Economic Development Cooperation at the Swiss Embassy in Pretoria in January 2023.*



**Dr Diego Masera, United Nations Industrial Development Organization (UNIDO)**

*Diego Masera serves as the UNIDO Representative for Southern Africa. Earlier in his career, Diego was Chief of the Renewable Energy Division at UNIDO, managing a portfolio of renewable technology projects. His innovative contributions were pivotal in the conceptualisation and development of the Sustainable Energy for All (SE4ALL) Initiative, which laid the foundation for SDG 7 (affordable and clean energy). As the Regional Technical Advisor on Energy and Climate Change for Latin America and the Caribbean at UNDP, Diego played a key role in introducing renewable energy and energy efficiency policies in several countries. His career also includes significant work in SME development in Africa.*



**Ms Nnana Makhubu, Chairperson: Southern African Essential Oil Producers' Association (SAEOPA)**

*Nnana Makhubu worked at a nursery producing herbs for spices, medicinal and fragrance uses for 18 years and obtained her qualification in ornamental horticulture from Lifestyle garden college. Working at an essential oil incubator for seven years, she also trained as a facilitator and assessor for plant production and registered with Agriset. Her practical research on production of essential oils, increasing oil yields and good agricultural practices in plant production, resulted in an increase in the oil yield in Eastern Cape from 0.05 to 0.3 and from 0.05 to 0.23 in KwaZulu-Natal.*



**Mr Bernard Bau, Project Manager GQSP - SA Phase II, UNIDO**

*Bernard Bau is an Industrial Development Officer at UNIDO, and Head of the Competitiveness, Quality and Compliance Unit. With over 22 years of experience in international development, Bernard has managed technical assistance projects and programmes on quality infrastructure and value chain development, focusing on Africa and the Caribbean. At UNIDO, Bernard has held other significant roles such as Officer-in-charge of the Compliance Infrastructure Unit and serving as the 3 ADI focal point for Haiti, where he played a crucial role in developing the "Accelerated Agribusiness and Agro-industries Development Initiative".*



### 3 PRESENTATIONS

## DAY 1: KEYNOTE ADDRESS

The importance and relevance of aromatic and medicinal plant research – science of the future?

**Professor Ben-Erik Van Wyk, DST-NRF SARCHI National Research Chair in Indigenous Plant Use, University of Johannesburg, South Africa**

*Ben-Erik Van Wyk is a Professor at the University of Johannesburg in the Department of Botany and Plant Biotechnology. He is a plant taxonomist with a research interest in ethnobotany and economic botany. In 2013 he was awarded the NRF/SARCHI National Research Chair in Indigenous Plant Use. He is a recipient of the three highest national awards for botanists and scientists, from the South African Association of Botanists (SAAB Gold Medal, 2015), from the South African Academy of Science (M.T. Steyn Award for Natural Sciences and Technology Research and Excellence, 2020) and from the National Science and Technology Forum (NSTF Lifetime Award, 2024). He was also awarded a certificate of appreciation from SAEOPA for his continued dedication to the research of the uses of plants. He has been re-elected as chairman of the Indigenous Plant Use Forum every year since 1996.*

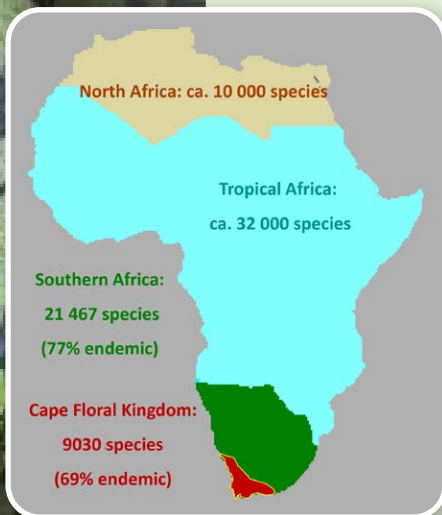


Africa boasts an exceptional diversity in terms of both cultural and botanical heritage, with the most ancient cultures and plant use practices on earth. The origins of medicinal and aromatic plant use by modern humans can be traced all the way back to the Cape Ixam (San hunter-gatherers; "bushmen") of the Karoo, who are the most ancient lineage of modern humans.

The San and Khoi healing system provides us with three new insights of global importance. Firstly, more than 50 aromatic plant species, which are unique to the southern African click-speaking people, have a history of use as Buchu. While Buchu is of profound medicinal, cosmetic, ritual and spiritual significance to the San and Khoi people, the chemistry and bioactivities of Buchu are poorly known and largely unstudied.

The second insight concerns mastication as the original oral dosage form for medicine. Hoodia is a misunderstood masticatory (functional food), of which small pieces of stems are eaten all day to suppress hunger and thirst. The fact that medicine was originally eaten, not drunk, has important implications for ethnopharmacological studies, including the effective breakdown of cellular material by prolonged chewing and reduced particle size and thus more efficient extraction of active chemical compounds. Mastication also provides prolonged exposure to saliva, prolonged buccal absorption and effective passing of the blood-brain barrier, and avoids acid hydrolysis in the stomach by bypassing the liver.

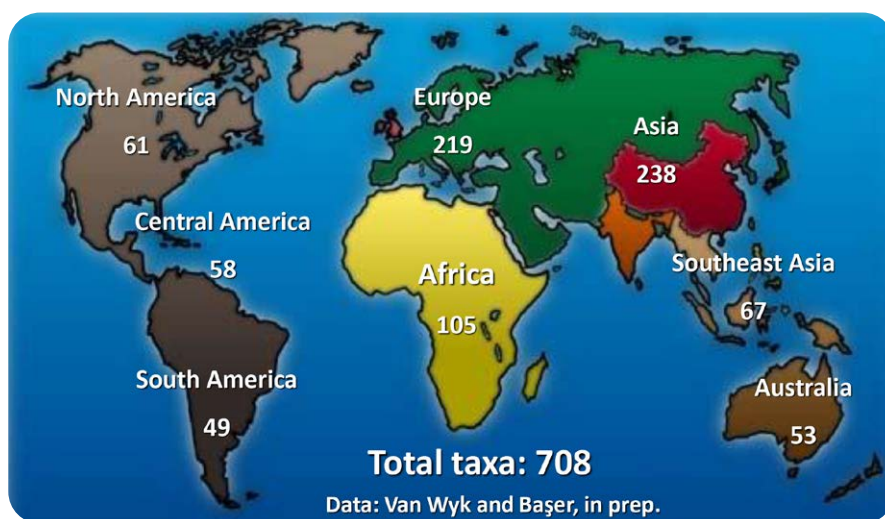




Thirdly, the medicinal ethnobotany of the IXam ("southern bushmen", "true bushmen"), although unrecorded, is not extinct. This was highlighted in quantitative, rigorous ethnobotanical studies in the Cape region, when an area of 120 000 ha, populated by indigenous people, was required to be evacuated for the SKA project. The IXam people who were interviewed when myths and legends were recorded in the 19<sup>th</sup> century came from southern Bushmanland, and the same myths and legends are still available in the contemporary folklore amongst Khoi people, so that the area is not only ground zero for radio-astronomy, but also ground zero for IXam (Bushman) ethnobotany.

The implications of these new insights is that a proper scientific understanding of the value of poorly known medicinal plants is needed to maximise the potential benefits of the precious San and Khoi medicinal plant heritage. Since Africa is ground zero for the concept of aromatherapy, we should lead the way in research and development of new crops and products.

This urgently requires inventories and reviews of essential oil plants to provide data for new innovations. A first global inventory shows 708 commercialised species, with only 43 from South Africa. For the industry, there are two options for success. The first is to compete with existing crops in existing markets, while the second option is to develop new crops and new products from indigenous species.



Global view: number of commercialised essential oil plants.





## SESSION 1:

# NAVIGATING GLOBAL STANDARDS AND HARMONISING NATIONAL REGULATIONS AND STANDARDS WITH NEW DEVELOPMENTS



### Session moderator: Ms Pri Elamthuruthil, UNIDO GQSP-SA

*Pri Elamthuruthil is a Project Administrator at UNIDO, based in Vienna, Austria. She supports technical assistance projects and programmes within the Competitiveness, Quality and Compliance Unit. Her responsibilities also include coordinating the various activities under the Global Quality and Standards Programme (GQSP) – South Africa Phase II with various project partners and fellow GQSP country teams. With over 10 years of experience in international development, Pri has focused specially on women’s empowerment and livelihood development.*

## Accessing markets through standards and quality assurance

### Dr Sadvir Bissoon, South African Bureau of Standards (SABS)

*Sadvir Bissoon is Head of Standards at the SABS, responsible for the development, promotion, maintenance and distribution of national standards. Sadvir has a wealth of experience in standardisation, having fulfilled various governance and leadership roles. Current roles include President of the South African National Committee (SANC) to the IEC, Council Member of the International Organisation for Standardisation (ISO), Member of the IEC Task Force on Long Term Sustainability, Executive Committee Member of Pacific Area Standards Community (PASC), Council Member of the African Organisation for Standardisation (ARSO), Council Member of the African Electro-technical Commission (AFSEC) and Member of the BRICS Standardisation forum.*

Established in 1945, the SABS is responsible for the development of South African National Standards (SANS). With more than 7,000 national standards being published per annum, they play a crucial role in South Africa’s achievement of the United Nations’ 17 Strategic Development Goals and the National Development Plan. In addition, they are vital to accessing global markets, and in particular the African Continental Free Trade Area, which comprises 13 % of global trade. With South Africa’s quality infrastructure relatively mature compared to other regions, transitioning its standards into the African continent for trade purposes will assist the essential oils industry penetrate this significant market.

Standards reflect the state-of-the-art and serve as a vehicle for the dissemination of new technologies and innovative practices, to facilitate trade and to support industrialisation



objectives. Standards support the technical aspects of societal, governance and environmental policies and contribute to sustainable development. They are used as the basis for national technical regulations without causing unnecessary technical barriers to trade and offer a range of tools for conformity assessment to enhance confidence in products, systems, processes and personnel. Importantly, they also assist consumers in making informed buying decisions.



## Did you know

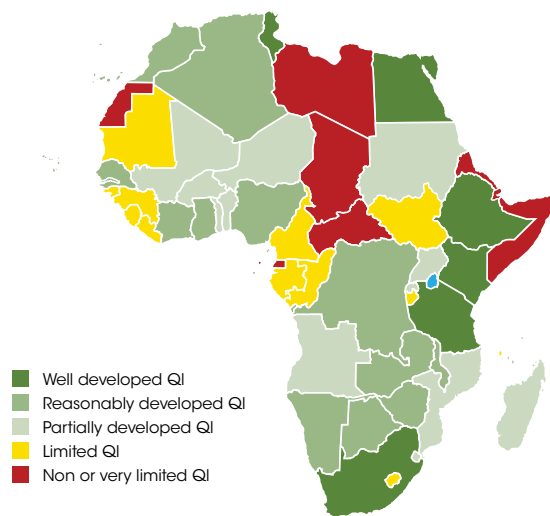
"Which indigenous South African oil, obtained from the nuts of a tree in the Kalahari Desert, is known for its high vitamin E content and ability to protect the skin from harsh environmental conditions?"

**Answer: Manketti (Mongongo) oil**



The conformity assessment regime for regulators allows them to consider which option best meets their needs by taking into account the following: the nature of the risks involved; the extent or complexity of the conformity assessment required; the ability to practically access the selected conformity assessment option at the domestic level; the anticipated costs of each conformity assessment option (in terms of administrative burden, price and time involved); the degree of independence the regulator expects in terms of providing conformity assessment results and statements of conformity; and the level of market and political acceptance of the proposed option.

*Stocktaking Map of Quality infrastructure in Africa*





**Mr Jaco Marneweck, National Regulator of Compulsory Specifications (NRCS)**

*Jaco Marneweck has a 35-year career in trade metrology/ legal metrology, and is currently Senior Manager: Inspections in the Legal Metrology unit of the NRCS. Jaco is also the acting General Manager Legal Metrology and therefore CIML member for South Africa, member country representative to SADC MEL (South African Development Community Cooperation in Legal Metrology) and member country representative to AFRIMETS (Intra-Africa Metrology System). Jaco represents South Africa on OIML (International Organization for Legal Metrology) as convenor for the Technical Committee on "Prepackaged Products" and is the Chairperson of the OIML CEEMS AG on matters concerning Countries and Economies with Emerging Metrology Systems.*



Legal Metrology is a unit within the NRCS responsible for implementing the Legal Metrology Act, 2014. Legal Metrology involves the legislated use of metrology (through technical regulations) to ensure that fair weights and measures are applied in both national, and import and export trade. Typical activities include approval of measuring instruments used in trade and their ongoing verification; inspection of measuring instruments and prepackages; and application of sanctions when noncompliant with legislation; as well as calibration of measurement standards used by the regulator and industry.

Model regulations for measuring instruments and prepackages used in Legal Metrology are developed by the International Organization of Legal Metrology (OIML) and adopted nationally, usually through the national standards body (SABS). Two regulations are applicable to the essential oils industry. These are SANS 289: 2022, which covers labelling requirements for prepackaged products and general requirements for the sale of goods subject to Legal Metrology control; and SANS 458: 2011, which covers tolerances permitted for the accuracy of measurements of products.

The act specifies that no person may import, manufacture, sell or supply a measuring instrument or product, or render a service, to which a legal metrology technical regulation applies, except in accordance with the regulation. In cases of nonconformance to the legal metrology technical regulation, the National Regulator directs that the measuring instrument, product or service must be brought into compliance with the regulation. Failing that, the measuring instrument, product or service will be confiscated, destroyed or returned to the country of origin.

A person convicted of non-compliance is liable to a fine or imprisonment and is disqualified from performing any duty or function provided for in the Legal Metrology Act.

There are also significant monetary implications associated with non-compliance. In the first quarter of 2024, 7% of 5,921 products sampled were found to be mislabelled. In addition, the monetary cost of the products withdrawn from the market due to non-compliance represented R47 million of the R411 million worth of products.



## Testing for quality as value adding and marketing tool

### **Dr Dennis Mkhize, National Metrology Institute of South Africa (NMISA)**

*Dennis Mkhize holds a PhD in Analytical Chemistry and is a Senior Scientist at NMISA, where he has been involved in numerous projects impacting the agricultural, environmental, pharmaceutical, public health, law enforcement and mining industries. One of the key projects he has been involved in was the GC profiling of essential oils, for which NMISA is now accredited. With special focus on gas chromatography, Dennis has also been involved in several other projects, including pesticides and POPs analysis in environmental matrices, fatty acid profiling in food matrices, dioxin analysis and the identification of food authenticity.*



The global essential oils market is a multi-billion dollar industry, with a constant and growing demand from various industries. South Africa is a key player in the production and trade of essential oils, which have the potential to be sold in significant quantities across the globe. However, an ISO 17025 accredited certificate of analysis is required for local producers to sell their produce internationally, for a range of reasons. Standards and specifications exist to safeguard the quality of oils, while pure oils with a good organoleptic quality demand a higher market price and hence more profit. The possibility of adulteration can also be detected.

Previously, different tests were conducted in different laboratories but now, as a result of a collaborative effort between NMISA, UNIDO and **the dtic**, ISO 17025 accredited services have been established for testing the quality of essential oils and ensuring they meet specific quality standards. As a result, South Africa now has a fully accredited laboratory for testing essential oils, thus removing this major barrier to trade.

Since essential oils are complex mixtures, their quality assessment requires multifarious analyses. Six ISO standards are used for the evaluation of the quality of essential oils, based on the following parameters: Relative

Density, Refractive Index, Optical Rotation, Acid Value, Miscibility and Chromatographic profiling. The latter is the most important technique as it allows for determination of the chemical composition of the oils. It can give the percentage composition of the oils and is both qualitative and quantitative in nature. It is useful in determining anomalies in known oils and for the full evaluation of new oils.

In order to ensure quality assurance of its testing services, prior to analysis, rigorous quality control testing is done and Quality Controls (QCs) are analysed. The laboratory participates in annual proficiency testing (PT) schemes, normally conducted through BIPEA (France), with recent PT results for the different tests proving satisfactory, showing excellent z-scores for the different tests.





## The adulteration of essential and vegetable oils - a global problem

**Dr Prabodh Satyal, Aromatic Plant Research Centre, USA**

Prabodh Satyal is the Chief Scientific Officer at the Aromatic Plant Research Center (APRC). Prabodh has analysed the chemical composition of over 100,000 essential oils worldwide and has nearly 15 years experience as a purity analyst in various capacities. He has created the only known mass spectral library of synthetic markers and has been instrumental in establishing several essential oil databases. He is developing the first fully automated adulteration analysis software for GC-MS, which will identify the purity, origin and mixed sources in essential oils.



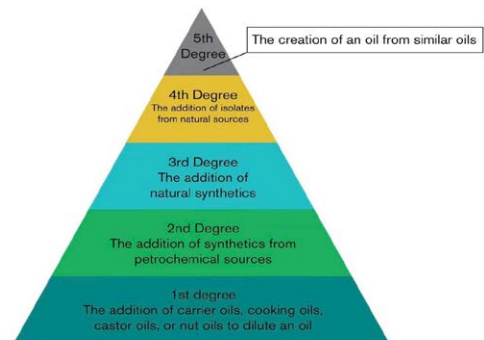
Adulteration of plant oils is rampant, with very few pure essential oils on the market. In a recent market survey of 500 oils on the US market, 80% were found to be adulterated. In the Indian (15 oils sampled) and Australian (nine oils sampled) markets, 100% were adulterated, while on the Taiwan market (five oils sampled), 80% were adulterated. On the Japanese market, with 45 oils tested, 71% were adulterated, and on the European market, 70% of the 190 oils tested were adulterated. Four samples were tested on the China market, with all, 100%, adulterated.

With regard to the oils themselves, of the 50 Lavender oil samples tested, 80% were adulterated. 100% of the 17 Birch essential oil samples were adulterated and 95% of the 20 Bergamot samples. 100% of 15 Clove Bud samples were adulterated.

It was also found that there is more chance of adulteration when there are multiple layers involved in getting the plant oils to the market, with the brokers most likely to adulterate the oil.

Mislabelling is another common problem: for example labelling cinnamon as cinnamon bark oil, as the bark oil is that much more expensive than that extracted from the leaf.

The widespread adulteration is motivated by profit and is largely due to instrumental limitations and lack of regulation. Biomarkers and synthetic markers, in addition to chemometric evaluations, are urgently required for authentication of essential oils.



*Degrees of adulteration:  
Sophistication of detection*







## Can Agro-ecosystems perspectives help in Vetiver oil production and livelihoods - a case study from southern India

**Dr E.V.S.Prakasa Rao, CSIR Paradigm Institute, India**



*Prakasa Rao is an Honorary Scientist with the CSIR-Fourth Paradigm Institute and former Head of the Central Institute of Medicinal and Aromatic Plants, Research Centre, Bangalore. He is a fellow of the National Academy of Agricultural Sciences, Indian Society of Agronomy, and Indian Society of Spices; and recipient of the Indian Society of Agronomy Gold Medal, Fertiliser Association of India Silver Jubilee Award of Excellence (1993), PPIC-FAI Award (2001), and IMPHOS-FAI Award (2012). He was awarded a PhD in Agronomy from the Indian Agricultural Research Institute, New Delhi.*

Vetiver (*Vetivaria zizanioides*) is an important tropical grass used widely for environmental and soil protection due to its perennial nature, strong root system and use in phytoremediation. It is also used in perfumery and flavours, in handicrafts, and for shelter, where it is used for thatching roofs and makeshift houses. Other uses include traditional drinks and fodder.

South India is traditionally known for the cultivated variety of *Vetivaria zizanioides*. More than 3,000 ha of Vetiver are cultivated in all the south Indian states.

In the case study, dolomite was applied in acidic soils to increase Vetiver oil yields. Results showed that after dolomite treatment, the oil yield increased to 0.48 g/plant as opposed to the 0.32 g/plant of the control area.

Efficient distillation methods are also important to improved productivity as they can bring down the long distillation durations (72 - 96 hours) of traditional distillation to nearly 18 hours. This reduces the cost of distillation and improves economics. Tests showed that 18 man days/batch of Vetiver was required for conventional distillation, reducing to three days (with a low carbon footprint) for the improved distillation. For conventional distillation, the oil recovery was 0.78% and the oil yield 17 kg/ha, while, for the improved method, the oil recovery was 1.0% and 25 kg/ha.

The community projects in India around Vetiver production have highlighted that the quality of essential oils depends on numerous factors, for example the importance of climate and soil, planting, harvesting and processing methods, moisture and storage conditions and adulteration.

The need for community projects to work closely with quality control laboratories to compete in the market and increase economic viability has also been highlighted. Tests should cover both the physical and chemical properties of the oil. Gas chromatography is of particular importance as its advantages over other methods include faster, more accurate and more reproducible results. In addition, a microgram quantity of sample is required, a qualitative and quantitative estimation of major and minor constituents in the oil can be done, adulteration in the sample and terpene hydrocarbons can be detected, and new compounds in the natural essential oils can be detected.





**SESSION 2:****MARKETS – Exploring new horizons: local to global trends in the essential and vegetable oils.**

**Session moderator: Ms Preshanthie Naicker, Department of Environment, Forestry and Fisheries (DFFE)**

*Preshanthie Naicker has 15 years experience within the environmental sustainability industry in developing and implementing environmental business best practice and strategies, environmental legislative and regulatory policies, advising and supporting operational sustainability, and leading national and international projects. She is currently employed at the DFFE as the Director for a UNDP/GEF 6 international project. Preshanthie's portfolios have supported the Government in widespread implementation of the Convention on Biological Diversity and Nagoya Protocol on Access and Benefit-Sharing and have contributed to the implementation of the Kunming-Montreal Global Biodiversity.*

**Essential oil combinations and antimicrobial activity**

**Professor Sandy van Vuuren, University of Witwatersrand**

*Sandy van Vuuren holds a personal professorship in the Department of Pharmacy and Pharmacology, University of Witwatersrand, where she has been employed for the past 39 years. Some of her most valuable research contributions have been towards the field of antimicrobial natural product studies. Furthermore, a strong emphasis of her research is in validating the anti-infective role of natural products in traditional healing in Africa. Another focus area, which brought both national and international recognition, is her scientific contribution towards combination studies where attention is given to interactions between African medicinal plants, essential oils and compounds, and conventional antimicrobials.*



While essential oils research has risen exponentially over the past 10 to 20 years, research into blends of different essential oils has remained at very low levels - less than half the research into essential oils.

Essential oils in combination offer considerable promise due to their potentially synergistic effects, however it is important to consider the pharmacological actions in blends to determine whether different oils combined together are in fact synergistic, additive, non-interactive or antagonistic.

Essential oils have been used traditionally for treatment of gangrenous wounds, but their effectiveness has not been scientifically proven. Studies on 119 combinations of 56 essential oils showed a combination of Sandalwood and Palmarosa to give the most promising synergistic results.

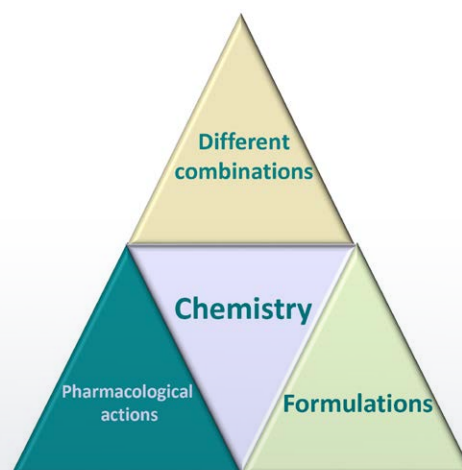


The next step was to establish the most effective hydrogel formulation, which showed that the antimicrobial properties of the hydrogel were in some cases even better than those of just the blends. Tests on carrier oils used in combination with essential oils were also carried out to determine whether they have a positive or negative effect on the blends. Five carrier oils were tested with 23 essential oils against 11 dermatological pathogens, giving 1,518 combinations. No antagonism was found, with mostly additive/non-interactive interactions and 34 synergistic interactions. The carrier oil showing the most synergy was *Persea americana* (Avocado).

Studies on respiratory anti-infectives, using 58 essential oils and 3,361 combinations, found 26% to be synergistic, 31% additive, 37% non-interactive and 6% antagonistic. In addition to the antimicrobial activity, other pharmacological activity can include an anti-inflammatory effect and toxicity. Five safe (in terms of toxicity) and effective essential oil combinations were identified, with increased

antimicrobial efficacy and anti-inflammatory activity, when used in combinations.

Given the critical role chemistry plays, compound analysis was carried out. Tests on two chemotypes of Sandalwood (*Santalum album* and *Santalum austrocaledonicum*), in combination with Frankincense (*Boswellia carterii*), showed the former to be non-interactive and the latter to be synergistic. Various combinations of enantiomers also produced different interactions.



Complexity of blends.





## The importance of essential oils in the flavour and fragrance industry

**Ms Sharon Bolel, SA Association of the Flavour & Fragrance Industry (SAAFFI)**

Sharon Bolel holds formal qualifications in Chemistry, Mathematics, Microbiology, Business Management and Marketing. She has worked as a food scientist, in medical research, as a technical editor, and in technical sales, marketing and general management. Currently, as Executive Director of SAAFFI, Sharon has the opportunity to nurture her abiding interest in all aspects of the flavour and fragrance industry. She has a particular interest in educating and informing the food, beverage and FMCG industry and consumer about the important role and significance of flavourings and fragrances.



The fragrance and flavour industry is a little known industry, despite being so large with fragrances and flavours to be found in everyday products from food to cosmetics and even crayons and paints.

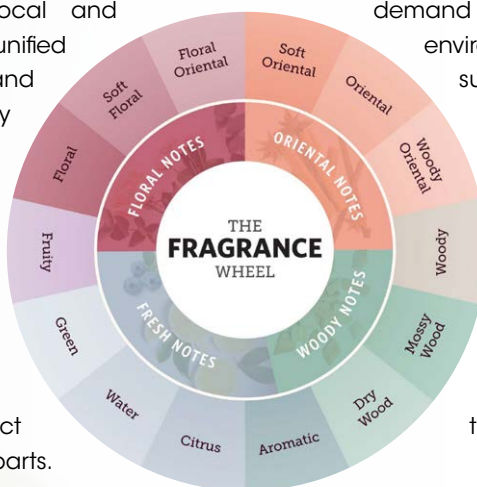
As a result, SAAFFI plays a vital role in raising the profile of the industry, in addition to providing members the opportunity to keep up-to-date on changing local and international regulations, providing a unified industry approach to risk management and raising and maintaining high industry standards. In addition, members have the opportunity to connect to relevant global organisations and to benefit from focused education and training.

Despite the traditional definition, essential oils are not essential as in 'being a necessary part of'. They are concentrated essences that are the product of the distillation or expression of plants' parts. They contain the plant's aroma molecules and are volatile oils that impart the characteristic aroma of plants. Importantly, they have therapeutic properties.

Essential oils are the cornerstone of the fragrance industry, with a trickle-down effect from fine fragrances to more economical products such as shampoo. Fragrance families are in fact defined in terms of the essential oils they contain.

In addition to their ubiquitous use in the fragrance industry, essential oils offer the potential for widespread application in flavourings due to their many advantages over raw spices and herbs. These include the fact that Food Grade Essential Oils are standardised, essential oils are more concentrated so smaller quantities are required, the sensory effects of essential oils involve nearly all our senses, and there is a growing demand for natural ingredients along with growing environmental awareness. The importance of sustainability has highlighted the benefits of using essential oils as flavourings, with the development of "A Sustainability Charter for the Entire Global Flavour and Fragrance Industry" firmly entrenching this industry as a leader in sustainability.

Such global influences will ensure that essential oils will remain at the forefront of the flavour and fragrance industry.



## Comments from delegates

“

“SAEOPA is the gateway to effective networking and enhancing the industry.”

“We are rich in indigenous plants and we need to utilise them to elevate poverty.”

”

## Selected indigenous plants with potential as sources of vegetable and essential oils for the cosmeceutical industries

**Professor Godfrey Elijah Zharare, University of Zululand**

Godfrey Zharare is a plant scientist and Professor in the Department of Agriculture at the University of Zululand, specialising in Agronomy and Plant Physiology. Godfrey is also recognised as a leading scientist in the areas of groundnut mineral nutrition and the management of the groundnut leaf miner pest. His current research focuses on the commercialisation and domestication of indigenous fruit, vegetable oil and essential oil plants. Professor Zharare is particularly focused on transforming oil plants, *Strychnos* species, *Lagdera crispata*, and *Trichilia emetica* (Natal Mahogany), into viable horticultural crops.



The University of Zululand's programme on the development and improvement of selected indigenous plants as horticultural crops of high value aims to establish new horticultural industries that support the food and beverage, cosmetic, pharmaceutical and nutraceutical industries, and to produce new products on the market for these industries. Current species of interest include *Strychnos madagascariensis*, *Strychnos innocua*, *Strychnos pungens*, *Lagdera crispata*, and *Inhambanella henriquesii*.

*Strychnos* seeds constitute 44% of the total fruit biomass, with seed coat oil content ranging from 42% to 52% and the overall oil content of the fruit between 8% and 13%. This indicates that approximately 400 tonnes per annum (tpa) of oil could be produced from 100,000 trees (Ligthelm et al., 1951).

To extract the oil, a centrifuge juicer or brush finisher is used to remove the *Strychnos* seed coats and create a seed coat puree. Solvent extraction from the wet puree, particularly with methanol, achieves the highest oil yield at 8%. Alternatively, oil can be mechanically pressed from the dried seed coats using a screw press, which is generally preferred over solvent extraction due to its higher efficiency.

The programme has also revealed differences in the physicochemical properties of *Strychnos* seed coat oil from trees with varying fruit sizes, such as differences in fatty acid composition and tocol profiles.

The fatty acid composition of *Strychnos pungens* and *Strychnos madagascariensis* seed coat oils shows a high proportion of oleic acid, along with moderate levels of linoleic acid and linolenic acid. This composition is similar to that of olive oil, which is predominantly oleic acid.

For other species in the programme, *Lagdera crispata* produces both fixed and essential oils. The oil, which is highly aromatic and suitable for perfumery, is found in trichomes similar to those in Cannabis and has various medicinal uses. *Inhambanella henriquesii*, belonging to the same family as the Shea Butter tree, provides a vegetable oil with a well-balanced fatty acid profile. Its seeds are up to 3 cm long, with the kernel containing up to 67% oil.







### **Ms Doryce Sher, Aroma Apothecary**

*Doryce Sher worked as a pharmacist for 10 years, during which time she came to believe that many medicines were overprescribed and overused. Doryce studied aromatherapy and began to understand how plant-based ingredients can alleviate many of the everyday ills. Her pharmaceutical background afforded her the confidence to experiment and formulate products in response to people's needs using plant-based ingredients. Doryce has created different products that have been used and sought after by people over the past 29 years. She is a registered Aromatherapist and Pharmacist.*

Aromatherapy is the art and science of using essential oils extracted from aromatic plants, to improve and maintain the health and wellbeing of the mind, body and soul. Essential oils improve physical, emotional, and spiritual well-being, by working through inhalation and /or absorption.

Each essential oil has specific properties and benefits. For example, Lavender is known for its calming effects, while Peppermint can be invigorating and help with concentration. Aromatherapy is often used to manage stress, improve sleep, alleviate pain, and enhance overall wellbeing.

There is much overlap and also multipurpose use of each individual oil. They are often versatile and mixes/

combinations result in the whole being more than the sum of its parts.

Citrus oils like Lemon, Orange, and Grapefruit are uplifting and can boost mood and energy levels. Geranium is one of the indigenous oils, of which Rose Geranium is a favourite. It is balancing, uplifting, calming and hormonally regulating. Lavender and Neroli (Orange Blossom) are popular for promoting better sleep and relaxation before bedtime. Essential oils like Lavender, Neroli and Geranium are commonly used to promote relaxation and reduce stress and anxiety. Other oils such as Bergamot, Helichrysum and Ylang are known for their stress-relieving properties, helping to calm the mind and body.

More uses include pain relief from oils like Peppermint, Rosemary, Ginger and Eucalyptus, which help alleviate muscle aches and pains. For skin care, Tea Tree oil is used for its antibacterial properties, while for respiratory support, Eucalyptus and Peppermint oils are beneficial for clearing the airways and easing congestion.

When using essential oils, "Less is better than more". "A little cures what a lot kills." Drops are sufficient and are diluted in carrier or base oils, creams and lotions. The recipe: HALF THE NUMBER OF DROPS per ml and no stronger than 3% vol/volume.

Never use oils near the eyes or internally. Oils may be contraindicated with homeopathic preparations and with chemotherapy. Do not massage babies under three months old and use very dilute oils for babies. Use half dilutions for children under three and for the elderly and frail.







**SAEOPA**

Southern African Essential Oil Producers' Association



3<sup>RD</sup> SOUTH AFRICAN CONFERENCE ON ESSENTIAL AND VEGETABLE OILS



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# DAY 2: KEYNOTE ADDRESS

## How to innovate from where you are

### Dr Shawn Cunningham, Mesopartner

Shawn Cunningham is a process consultant working in innovation and socioeconomic change. He is a partner in the international development consultancy Mesopartner (based in Germany) and a Professor of Practice with the DST/NRF/Newton Fund Trilateral Chair in Transformative Innovation, the Fourth Industrial Revolution and Sustainable Development, hosted by the College of Business and Economics at the University of Johannesburg. He is an international advisor to several think tanks, universities, development organisations and governments worldwide. From October 2020 to August 2022, he was a council member of the World Economic Forum's Global Future Council for Economic Growth and Recovery.

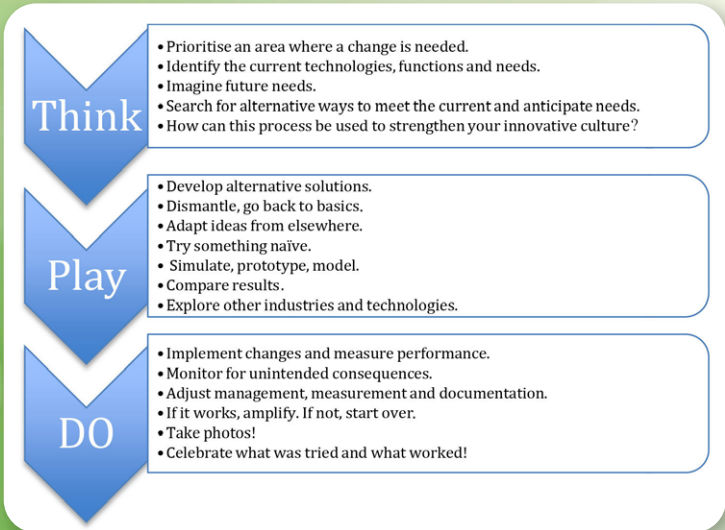


Research tells us that Innovation is not an invention; it is a process and not an event. Innovation is about learning and problem-solving. There is no "off the shelf" technology, it is path-dependent, it is driven by the prevailing and incentive structure, and it happens in a systemic context.

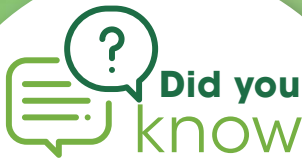
Innovation is, therefore, about change, about changing how you do things. It is a process of recombining what you have, filling in gaps, and integrating ideas from elsewhere. Adapting ideas from elsewhere is also innovative.

There are three main kinds of innovation. Product/Service innovation is the most common. Process innovation is difficult but critical as consumers often buy a product because of the business process. Business model innovation means a change to the way your business works, be it, for example, a new warehouse or a joint venture. It is also often difficult as you need to remove yourself from operations and think of the future.

The "Think, Play, Do" framework by Dodgson, Gann and Salter provides a solid framework for innovating from where you are.



To nurture your innovation culture, with each Think, Play, Do cycle, add an innovation resource: space, software, tools, books, magazines, and whiteboards. Encourage measurement before, during and after changes and focus on small innovations to encourage learning and risk-taking. Conduct experiments in the open – let everyone predict and see (verify) the results. Do a pre-mortem: Assume the innovation failed. Why did it fail? Promote the practice of building coherent arguments for change in your teams. Go and learn from others who are different from you.



**Did you know**

"Which South African vegetable oil is known for being rich in omega-6 and omega-9 fatty acids, making it a great addition to a healthy diet?"

**Answer: Marula oil**

Improved PC Board Washer, S. Cunningham





## SESSION 3:

# AGRICULTURE – Cultivating success: innovations in local agriculture for global impact



**Session moderator: Ms Rosemary du Preez, Director SAEOPA**

Rosemary du Preez was a researcher for 40 years at the Agricultural Research Council (ARC). She is currently a board member of SAEOPA and Is'Baya Development Trust and is involved in initiatives to develop small farmers in the Eastern Cape and to expand the initiative to other provinces. She received the ARC Award for Excellence for Outstanding Contribution by a Female in 2015, the Indigenous Product Award from the Indigenous Plant Use Forum in 2016, and a certificate of recognition for Outstanding Contribution to Women Empowerment in the Environment Industry in 2018.

### Essential oil crops cultivation innovation. Effect of planting density, harvesting frequency and shade/open field production on fresh yield of *Helichrysum*

#### **Professor Riana Kleynhans, Tshwane University of Technology (TUT)**

As a researcher at the Agricultural Research Council (ARC), Riana Kleynhans has been involved in research on flower bulbs for more than 20 years. Seven new cultivars were registered with Plant Breeder's Rights from this research. In 2011 Riana became involved in the medicinal plant research programme at the ARC, which entailed the management and execution of multi-disciplinary externally funded projects and involved various community-based initiatives. Professor Kleynhans joined the Department of Horticulture at the Tshwane University of Technology in 2013. At TUT Riana is involved in teaching horticulture related subjects and her research focus is on the development of propagation and cultivation techniques for various indigenous plant species.



While *Helichrysum odoratissimum*, also known as 'Imphepho', has various ethnobotanical uses, there is limited cultivation information available, especially linked to cost of production. The objectives of this research were therefore to investigate the effect of planting density and harvesting frequency on biomass yield, with the research being carried out under shade net (40%) and in open field conditions. Seasonal variation in essential oil composition is also being researched.

At the research site, rooted cuttings were transplanted to raised beds in the open field and under the shade conditions. Three different planting densities were used, as well as harvesting frequencies,

Results after Season 1 showed that, with open field planting, multiple harvests stimulated re-growth and harvesting thrice doubled total yield in comparison with one harvest. The

shade net planting showed a slower recovery, which was complicated by excessive rain and slower drainage, and lower yields than outside planting. Harvesting thrice still gave almost double the yield compared to once off harvesting.

Season 2 results showed generally lower yields than in the first season. With the open field planting, frost damage led to slow sprouting and growth and lower yields were experienced compared to the first season in all three harvest periods. With shade net, yields were higher than in the open field, with no frost damage. However, slow recovery of the thrice harvested material was still evident.

In general, multiple cuts promote rejuvenation and once off harvesting results in lots of woody growth. Based on the preliminary data, two plants/m<sup>2</sup> recovered better than the other densities, especially under shade net.



## Importance of medicinal, essential and vegetable oil plants as Industrial Crops

**Ms Johanna Mokobodi, Department of Agriculture, Land Reform and Rural Development (DALRRD)**

*Johanna Mokobodi is part of the Directorate of Plant Production with DALRRD. She has worked with various plant production industries such as grains and ornamentals and is currently working with the fruits and industrial crops industry. Her line of work includes development, implementation and promotion of programmes and projects that support sustainable crop production practices; and providing advisory and technical support on crop production related matters. Her goal is to promote sustainable crop production practices and for all agricultural commodities to contribute to the economy.*



The Directorate Plant Production (DPP) of DALRRD provides national leadership and support to South Africa’s plant production industry to assist in ensuring food security, economic development, and poverty alleviation, through the development, promotion and co-ordination of the appropriate regulatory frameworks and practices. The DPP has two Units dealing with indigenous plants. These are the Indigenous Food Crops Unit dealing with indigenous food crops such as cereals, pulses, tubers, leafy vegetables and fruits; and the Industrial Crops Unit, which deals with indigenous and commercial crops, including medicinal, fibre, beverage and essential oil crops.

While it is commonly known that the importance of industrial crops is in their commercial value, job creation is also a major benefit, as is the potential for income diversification for farmers.

DALRRD is involved in a number of research projects with important outcomes for crop development, such as production guidelines for African Leafy vegetables. Research on Baobab species has shown that it can be propagated vegetatively, while ongoing research on Marula product development is evaluating consumer acceptance of jams.

An essential oil crops production guideline has been developed with the Agricultural Research Council (ARC) and a survey on pests and diseases of essential oil crops is underway.

Some eight ongoing projects on medicinal crops revolve around cultivation trials/protocols, value addition, product development and characterisation of active ingredients.

Amongst the challenges facing the industry is lack of awareness of the nutritional, health and economic benefits of these plants. In addition, most of the indigenous crops are harvested in the wild and therefore not sustainable. There is also less investment in indigenous fruit research, and amongst the farmer support programmes, indigenous/industrial crops are not prioritised. This fragmented industry has high levels of secrecy and a lack of technology transfer.

Intervention measures by DALRRD range from awareness and research programmes through to information materials and training and capacity building. Support is also provided for commercialisation/market development for these crops in collaboration with relevant stakeholders.

Various DALRRD Farmer Support Programmes are available including the Comprehensive Agricultural Support Programme (CASAP) and Ilima Letsema, the Blended Finance Scheme and Agro-Energy Fund (AEF).

### “ Comments from delegates ”

*“Our country has a potential to have one of the most competitive essential & vegetable oils industries - Bravo! Home is best!”*

*“The exciting potential of the industry - especially new avenues such as agri-tourism.”*





**SESSION 4:**

**Securing the Future**

**Wild harvesting and cultivation practices by communities**

**Mr Tafara Shuro, Qobo Qobo (QQ)**

Tafara Shuro has been involved in community development and training for several years, having joined Siyakholwa in 2010 and being involved in projects aimed at alleviating poverty through different interventions, including agriculture and entrepreneurial development. He is currently involved in turning Qobo Qobo, a social enterprise in Keiskammahoek, Eastern Cape, into a profit-making enterprise. His experience covers market access, cultivation and wild harvesting. The QQ incubator has made inroads into the local and international market for herbs and essential oils, with his leadership propelling the incubator into one of the few successful community Agro incubators in South Africa.



In Keiskammahoek in South Africa's Eastern Cape, much of the population is totally dependent on government grants and subsistence farming. Rural development projects, although helpful in most cases for survival, have not succeeded in alleviating poverty in this rural town.

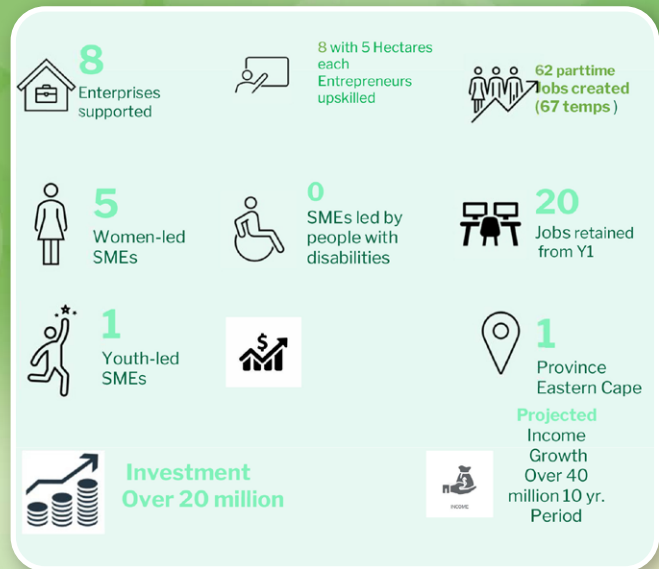
A new model of development work has been pioneered by Qobo Qobo to transition an essential oils project to a larger commercial social enterprise that enables emerging entrepreneurs in rural Keiskammahoek to use their land, develop a business, employ people and make a reasonable living. In the project, essential oils and herbs are obtained from both cultivation and wild harvesting from surrounding areas. For oil production and herb cultivation, plants are procured from an accredited nursery, while, with wild harvesting, one of the species that is readily available in the Eastern Cape is *Tagetes minuta* or Khakibos.

Insights to date include the fact that short term employment can be created through such a project; economic opportunities can be spread across the board from harvesters, to logistics and testing services; and wild harvesting complements cultivation. Doing both can increase the profitability of farmers.

In comparing wild harvesting to cultivation, the former offers easy access to plant material ready for processing and does not require infrastructure or machinery investment. However, there is an unpredictable supply of raw material and, where indigenous plants are involved, there may be delays associated with permits. Quality may also be difficult to manage and the oil profile may differ from one location

to another. In addition, distance may hinder the quantity of oil to be sourced, while processing may require additional skills or knowledge. Uncontrolled wild harvesting may also lead to extinction.

In terms of cultivation, it takes longer as processes such as land preparation and planting need to be considered. But it is more predictable and relatively easier to plan, harvest and process and it overcomes the challenges of wild harvesting such as managing quality. Therefore, for any commercially successfully wild harvested species, cultivation should be considered to manage complete depletion.



**QQ Essential Oils Incubator**

**Dr Ryan D. Rattray, University of Johannesburg**

Ryan Rattray is a postdoctoral researcher in the Department of Botany at the University of Johannesburg (UJ). His PhD research focused on the ethnobotanically significant Lamiaceae family in southern Africa. His contributions have been recognised with the Best Young Scientist Awards from the South African Association of Botanists and the Indigenous Plant Use Forum. Currently, he is the Project Manager for the DST-NRF SARChI: Indigenous Plant Use research group at UJ, coordinating research activities and the Indigenous Plant User's Forum. Ryan's main research activities focus on understanding and leveraging South Africa's botanical diversity.



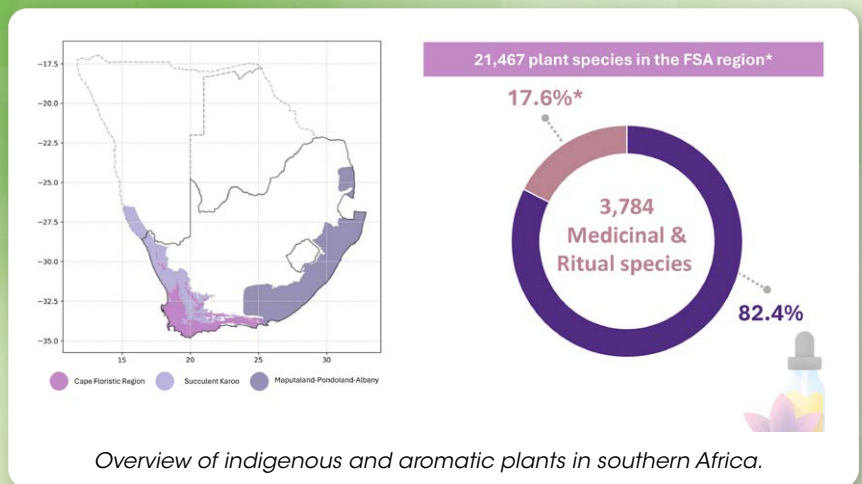
While South Africa does boast some success stories in the essential oils market, such as Rose Geranium, Buchu, African Wormwood and Fever Bush, there is considerable potential to enhance its presence in the global market through competing in existing markets, while exploring niche markets.

Current trends show a growing demand for natural and organic products, as evidenced in the South African fragrance market, meaning that there is high local demand but that it is import-dominated. As a result, there are opportunities to create niche markets for indigenous aromatic plants and the potential for local cultivation of popular oils, both based on sustainable practices and quality improvements.

To support the industry's efforts to gain market share, research and development are required to identify new indigenous species to expand the aromatic plant variety, increase the potential for unique essential oils and discover novel properties. Oil composition analyses of various new species will uncover commercial and medicinal value. At the same time, biological/pharmacological studies will support traditional medicinal applications and enable the development of new natural remedies and therapeutic products. Equally important is to optimise extraction methods for efficient and sustainable oil production, with the benefits of reduced environmental impact and enhanced oil purity and potency.

The global essential oils market is predicted to be \$15.8b by 2025, driven by consumer trends such as natural wellness, expanding applications, and advanced extraction and formulation technologies. There are also opportunities in new markets in Asia-Pacific and Latin America and in niche indigenous oils markets with a health focus. While this bodes well for South Africa with its rich biodiversity for unique oils, key challenges include the intense global competition and complex regulatory landscape.

With the vision to establish South Africa as a global leader in high-quality, sustainable indigenous oils, especially novel oils for niche products, the strategic focus should be research, innovation and partnerships to enhance research-industry collaboration. Sustainability is as important as the focus on eco-friendly practices and community engagement.





# SADC Partner Producers Reporting on Production and Challenges

The use of natural products and indigenous plants as a contributor to access health care and food supplement for rural communities

## Mr Rene Munya, Afya Health Products (Pty) Ltd, Angola

Rene Munya holds a MBA degree from De Montfort University, Leicester, England. He is the current President of the Moringa Development Association of South Africa (MDASA), and previously served as Vice-President of Africa Moringa Hub (AMH). Through his farm Afrinest Farm Projects (Pty) Ltd and his manufacturing company, Afya Health Products (Pty) Ltd, he has been involved in promoting the planting of the Moringa trees in the Limpopo and North West provinces of South Africa, and in Angola, Zambia, the DRC and Rwanda, amongst others. His farm in Limpopo works in collaboration with the University of Venda. He has presented to the Pan-African Parliament joint session on "The complementarity of Traditional Medicine using plants to contribute to access to health care for the populations and at lower cost".



Traditional plant medicine, used for centuries to treat ailments, has the potential to provide access to healthcare for rural communities at a fraction of the cost of Western medicine, while empowering communities, and fighting malnutrition and global warming.

The wide variety of plants and herbs used to treat physical, mental and spiritual ailments, include *Ruta graveolens*, (Rue), *Adansonia digitata* (Baobab), *Cannabis*, *Artemisia annua* (Sweet Wormwood) and *Moringa oleifera*, one of the few plant foods that contain chlorophyll together with other nutrients.

*Moringa oleifera's* medicinal benefits range from being anti-bacterial and anti-inflammatory, to anti-cancer, anti-ageing, anti-ulcer and anti-malarial. Some of its other uses, aside from "as food", are as an effective cattle fodder that increases cattle growth and milk production. Leaf extract is used as a natural plant growth enhancer, while the seeds produce oil, which is used as an illuminant, an ointment base, an ingredient for perfumery, cosmetics and skin and hair care products, a salad oil, and a biofuel/ biodiesel. Moringa seeds contain cationic polyelectrolyte, making them effective for water treatment and a natural flocculant substitute, while the bark is used to make mats, ropes or blue dye and for calico-printing and leather tanning.

With the required technology and operational funding available, Afya Health Products is aiming, by 2030, to have 40 ha high density planting under shade or green houses,

with 1,200 farmers trained to plant, 100 million trees planted and 18,000 tons of seeds producing 4,500 tons of oil. This will absorb 15 to 25 million tpa of CO<sub>2</sub>.

Going forward, actions are to establish a task team to promote collaboration between stakeholders involved in African medicinal plants, including state institutions and civil society, and to establish a research and development office to oversee the establishment of an African medicinal plants data base and local indigenous plant nurseries. In addition, member states will be encouraged to develop programmes and policies to support medicinal plant production and trade, and public awareness of the benefits of African traditional medicine should be raised. It is important to ensure that African traditional medicine complements and does not compete with Western medicine.



### **Ms Dagmar Honsbein, Cosmetic Producers of Namibia**

*Dagmar Honsbein is the owner of iDEALX integrated scientific services in Namibia. Dagmar is contracted under GeoMedia as senior technical advisor to the BioInnovation Africa (BIA) Project. She serves as lead consultant for various programmes and projects in Namibia. As part of the FSC standard development group, she has co-authored the Namibia National Forestry Standard. Under the BIA Project she was the lead author of the Namibian GACP Plus Standard for Devil's Claw (2019 - 2022), and works with the Union of Ethical BioTrade (UEBT) on sustainability verification.*



Namibia has a wealth of indigenous natural plant (INP) resources, but production is mainly artisanal, with significant traditional usage of the indigenous plants.

The main indigenous plants farmed for their commercial/ industrial value include Devil's Claw, of which approximately 600 tpa of dried, cut tubers are exported, and Marula, with approximately 15 tpa produced as 'raw' and cosmetics grade oil. Marula seed cake utilisation for human consumption, as well as fodder, is under investigation.

With Moringa, the leaves are mainly utilised, however the specific species is indigenous in India and the challenge is to prevent cross fertilisation with the indigenous plant. Baobab is used for fruit pulp, powder and cosmetics oil, though limited quantities are exported. Manketti (Mongongo) is used for cosmetics grade oil and food oil for mainly local consumption, with fruit pulp utilisation also under investigation. Mopane and Commiphora offer a lucrative market for essential oils for fragrances in cosmetics, while Jojoba is grown to produce cosmetics grade oil and Inara to produce cosmetics grade oil, mainly for export of final products, and food oil, mainly for local consumption. The leaves of the Silver Cluster Leaf (the botanical name is *Terminalia sericea*, which is not endemic but occurs in all sandveld areas of Southern Africa) are under research for cosmetics purposes. Silver Cluster Leaf is an indigenous tree species, which generally grows in sandy soils across southern Africa.

Current challenges include the international market pressure and dwindling offtake and the changing market and onerous import requirements. For example, the proposed changes by the European Medicines Agency (EMA) to the Good Agricultural and Collection Practices (GACP) guidelines:

will they allow for indoor cultivation? Also, the new EU Deforestation Regulation (EUDR) will affect all Namibia's value chains, irrespective of whether it is artisanal or commercial production. Other challenges include the lack of market research and the requirements of the newly implemented Access to Biological and Genetic Resources and Associated Traditional Knowledge (ABS) Act not being sufficiently understood. The lack of funding and financing instruments to commercialise INP potential for local beneficiation throughout the supply and value chain is also a challenge, particularly as the public awareness of indigenous plants is not at the level that market supply can support it.





### Ms Caroline Jacquet, Bio Innovation Zimbabwe (BIZ)

Caroline Jacquet studied Forestry and Natural Resources Management in Belgium and, since 2013, has been Projects Manager at Bio Innovation Zimbabwe (BIZ). In 2017, she started a company with BIZ colleagues. Hutano Foods makes breakfast and snack products from local ingredients, sourced from farmers and wild plant harvesters, increasing the value of traditional products they are familiar with. She's been involved in the organisation of the annual Good Seed and Food Festival in Harare since 2013, introducing more consumers to the benefits of traditional diets and promoting the consumption of locally produced, healthy ingredients.



Bio-Innovation Zimbabwe develops business opportunities for smallholders based on the sustainable harvesting and processing of indigenous plants. Its focus is in the dryland areas of Zimbabwe, where over-reliance on exotic (cash) crops has rendered farmers vulnerable to climate change. Its goal is to develop new market opportunities for indigenous plants that allow households to diversify their production base and strengthen their resilience and provide consumers in and outside Zimbabwe with high-quality products.

While there are a few large(r) producers of natural oils in Zimbabwe, there is a proliferation of small producers. Amongst the lessons learnt is that production of natural

oils does not equal a 'quick buck' and there are many producers without markets. Individual volumes are small and there is little collaboration. Given the many alternatives to SADC natural oils, a reliable, quality supply is key. Zimbabwean oils are expensive compared to oils from neighbouring countries, mainly due to poor infrastructure and manufacturing conditions and the fact that the country is landlocked.

Challenges include the fact that wild collection is unsustainable and there are no resource inventories. Indiscriminate access to source areas is given and no proper resource management is enforced by authorities. In addition, there is unreliable raw material supply and the seasonality means that the harvesting period is short and often coincides with busy times in the field. The weather impacts yields, and collection and processing are mostly manual with hygiene and contamination issues.

High production and exorbitant freight costs are compounded by the confusing regulatory landscape. Most of the producers are small, start-up businesses and there is little support from ZimTrade in terms of market development. Consumers are also unaware of the benefits of natural oils.

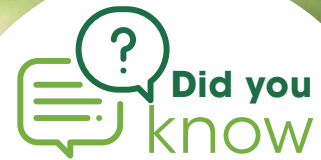
On the other hand, the biodiversity of Zimbabwe is a significant opportunity to produce a wide range of oils. Plants can be sourced in multiple areas. There are income opportunities for smallholders, especially in drought years, and there is a growing demand for natural products and the opportunity to make use of "local is lekker" and "return to roots".



"Which South African indigenous essential oil is often compared to Lavender for its calming properties?"

**Answer: Cape Chamomile**





“Which indigenous South African oil is traditionally used by the Khoisan people for its anti-inflammatory properties & moisturizing effects?”

**Answer: Kalahari  
Melon Seed oil**

## SESSION 5:

### COLLABORATIVE SUCCESS – Leveraging local and global partnerships



**Session moderator – Dr Jayne de Vos, Director, Applied Metrology, National Metrology Institute of South Africa (NMISA)**

*Jayne de Vos joined NMISA in 2002 and has since supported South Africa’s need for a sustainable quality infrastructure through the activities of the institute and the regional metrology organisation, AFRIMETS. Prior to joining NMISA, she developed methods for analysing persistent organic pollutants (POPs) while employed by the CSIR. Her current focus, although acting as CEO, includes the Africa Reference Institute, the NMISA Training Centre, elements of the portfolio for Regional, International Relations and Innovation (RIID), and how to ensure that NMISA products and services support measurement infrastructure and traceability for the South African economy.*





## Sheabutter and Moringa experiences

### Mr Joshua Harunah, AMH Global Traders, Ghana

While working as a remote sales director for West Africa, Joshua Harunah discovered the health benefits and economic potential of the Moringa tree. This resulted in Joshua specialising in Moringa marketing and sales and subsequently founding Africa Moringa Hub (AMH), a non-profit organisation, to instruct communities in growing Moringa, and producing and selling Moringa products. Joshua also established Moringa City in Ghana, a shopping centre dedicated to Moringa products, and instigated the registration of AMH Global Traders, an affiliate of AMH, to oversee all Moringa trading, sourcing buyers for its members and arranging international expos and summits.



Ghana grows many different oil crops for domestic, industrial and export purposes, ranging from Baobab to Coconut, Moringa and Shea.

There are a number of organisations involved in promoting indigenous oil crops, including the Widows and Orphans Movement (WOM), which has initiated and facilitated processes and programmes to empower widows and orphans through business enterprises such as Baobab oil production. Widows are often considered as cursed and have difficulty in reinstating themselves in communities.

Founded in 2013, Moringa Connect's supply chain serves over 2,500 small farming families throughout Ghana producing beauty products and food and who face many challenges. These include low soil fertility, hygiene in the making of powder, since almost immediate processing is needed and transport is difficult on the rural roads, and violent storms that damage trees grown for seeds and oil.

The northern Ghanaian city of Tamale derives its name from the traditional Dagombaname 'Tama-yile', the 'Home of Shea nuts'. Almost all rural households in northern Ghana depend heavily on Shea for their survival. The crop is mostly harvested, processed and sold by women and supplies more than half of their annual income. With global trade having increased significantly in the last decade, rural female incomes have improved in northern Ghana and contributed towards reducing the north-south development gap.

The Ghana Cocoa Board (COCOBOD) has instituted a floor price for Shea nut purchases to prevent exploitation of women and it is also instrumental in developing the area for the benefit of women producers.

Most of Ghana's Sheabutter is produced locally in rural cooperative groups. For example, the Dipaliya Sheabutter processing centre in Kumbungu produces 252 tpa of Sheabutter, employing 120 to 200 women processors. Ownership of the project belongs to the Dipaliya Women's Association and the community. The Jirapa Women's Cooperative produces 11 to 12 tpa of handcrafted Sheabutter. This network has approximately 1,800 women working in 38 groups. Each group has a farm for group activities, and each member in the group also does individual family farming.

## Comments from delegates

“

*"Quality will always be intertwined with branding, and therefore success of the industry."*

*"Essential oils are a complicated commodity and there is a detailed chemistry and scientific process that is important to understand."*

”

**Dr Bhavish Jugurnath, University of Mauritius**

*Bhavish Jugurnath is the President of the Africa Emerging Tech Hub, Vice Chairperson of the ACCA Mauritius Network Panel, and Executive Member of various international professional organisations. Bhavish also sits in various committees on emerging technologies in Mauritius, Namibia, Rwanda and Nigeria. Bhavish is currently working on projects in Fintech, Blockchain, Artificial Intelligence and Metaverse, mainly in Africa. He has been involved in projects for the Asian Pacific Economic Cooperation (APEC) in Australia, Singapore, Indonesia and Malaysia and in United Nations and European Union funded projects in Slovakia, Austria and Italy.*



The Medicinal and Aromatic Plants Academy for female entrepreneurs (MAPs ACE) project addresses the following: two entities from two EU countries (Slovak Republic and Hungary) will support development of vocational education and training in the region of Sub-Saharan Africa (Kenya, South Africa and Mauritius).

Project partners have long standing experience in international networking aimed at educating young people/ entrepreneurs engaged in MAP production and marketing under various geographic/environmental conditions (including Europe, South and Central America, Africa, Asia, etc.). In Sub-Saharan Africa, the aims are to support the development and implementation of sustainable reforms in education and training systems with a lifelong learning perspective, and the promotion of skills and skills development for the future. In particular, the aim is to improve the occupational prospects of young Africans through the development of innovative market-oriented skills.

The project is in harmony with the EU adopted goals "Towards a Comprehensive Strategy with Africa", Proposed Action 2 - Partner with Africa to boost the continent's digital transformation. This action is in line with the Sustainable Development Goals: quality education, gender equality, and industry, innovation and infrastructure. This requires focus on regulatory convergence, including strengthening personal data protection, investment in key enabling sustainable infrastructure, the digitalisation of public administrations for the provision of e-services, greater education and training opportunities and increasing secure data flows.

The EU should also pursue its cooperation with Africa on artificial intelligence, which should be responsibly developed and used. According to Action 3: Partners for sustainable growth and jobs, the close ties and geographic proximity between the EU and Africa make them natural allies in bringing about inclusive and sustainable economic growth on both continents.

Economic opportunities and decent job creation in Africa and the EU could be substantially enhanced through joint action on four priority fronts: (a) boosting trade and sustainable investments in Africa; (b) improving the investment climate and business environment; (c) increasing access to quality education, skills, research, innovation, health and social rights; and (d) advancing regional and continental economic integration. The European Green Deal is both the EU's new growth strategy and a plan to make Europe the world's first climate-neutral continent by 2050. With its huge renewable energy and biodiversity potential, Africa is extremely well placed to develop and implement sustainable solutions as its economy grows.



**Ms Karen Swanepoel, Executive Director, SAEOPA**

*Karen Swanepoel is a founder member and current Executive Director of SAEOPA. She has been actively involved in the research and development of natural products, specifically essential and vegetable oils, since 2000. She has been involved in many industry and feasibility studies on natural products and essential oils, and carried out research on indigenous plants for international fragrance and flavour companies. Karen has also done consultancy work on community involvement in natural products and has represented South Africa in several trade missions for natural products and essential oils.*



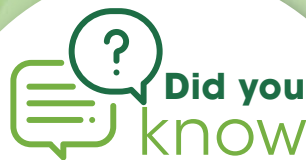
Formed by farmers for farmers, SAEOPA is a non-profit organisation established in 2000 to promote the production, processing and export of essential and vegetable oils from South Africa.

The Agricultural Business Chamber (Agbiz) has reiterated the agricultural industry's importance as a force for good in growing the South African economy and advancing the country's place on the global map. Essential and vegetable oils are an important component in this growth, which is why the GQSP-SA project is welcomed as, with quality standards in place, the industry can determine prices rather than accept what it is offered. It can be a price maker, rather than a price taker.

With the global trend towards combining international wellness and tourism, this presents a good opportunity for South Africa's essential oils industry to offer aroma tours, which are already popular in countries from Spain, France, Croatia and Italy, to Bali, Java and Zanzibar. South Africa, boasting 15 exporters of high quality oils, offers considerable potential for tours of the 'Big 5' in essential oils. Possible South African essential oil destinations include Lockenburgh in the Northern Cape, Babylonstoren in the Western Cape, Qobo-Qobo in the Eastern Cape, SOIL in KwaZulu-Natal, Highlands Essential Oil in the Free State, African Origin and Ruah in the North West Province, and Rosemary Hill and OBEDS in Gauteng, as well as producers in Limpopo and Mpumalanga. Most of the producers do have guest house facilities on site or in close proximity.

Tourists are increasingly looking for diversity and experiences. A Proudly South African Wellness Safari, offered in Mpumalanga, meets this need with game drives, cultural singing and dancing, art centre and workshops, wine tasting, gin mixing, boutique beers, an Amarula experience, seed oil pressing demonstrations and essential oil distilling on farms throughout the country.

Fortunately for the growth of the South African essential oils business, the country's strengths include research, technology, quality control and entrepreneurship, in addition to sunshine and smiles.



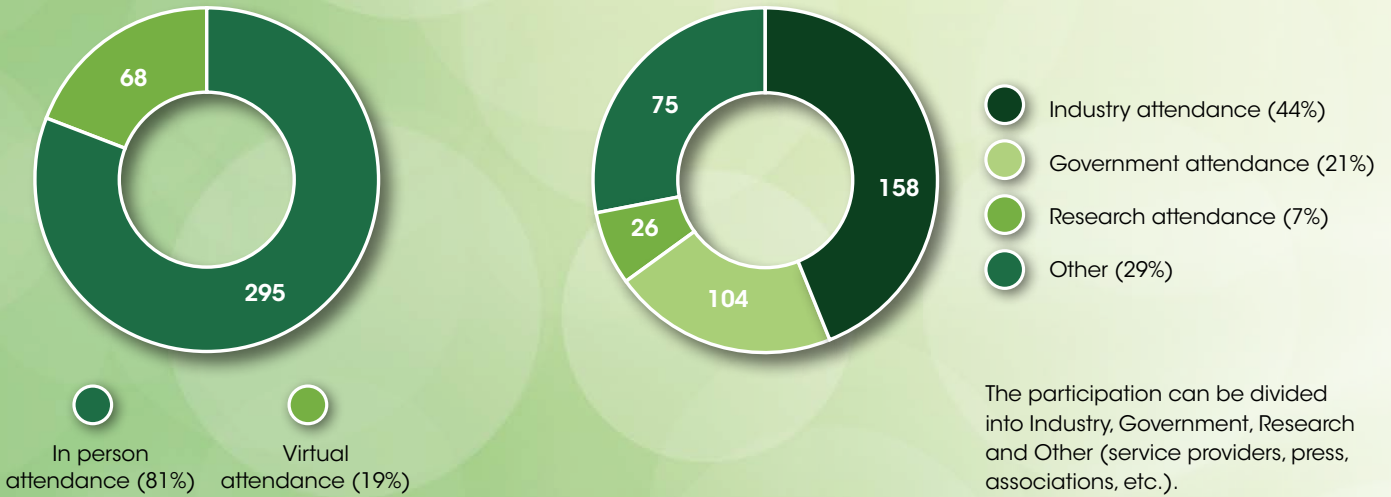
"Did you know South Africa is home to an essential oil that's often called 'nature's best insect repellent'? Can anyone guess which oil it is?"

**Answer: Lemon Bush  
(Lippia javanica)**



# 4 DELEGATES PROFILE AND EVALUATION OF THE CONFERENCE

Total attendance over the two-day conference was 363.  
The breakdown of attendance over the two-day conference was as follows:



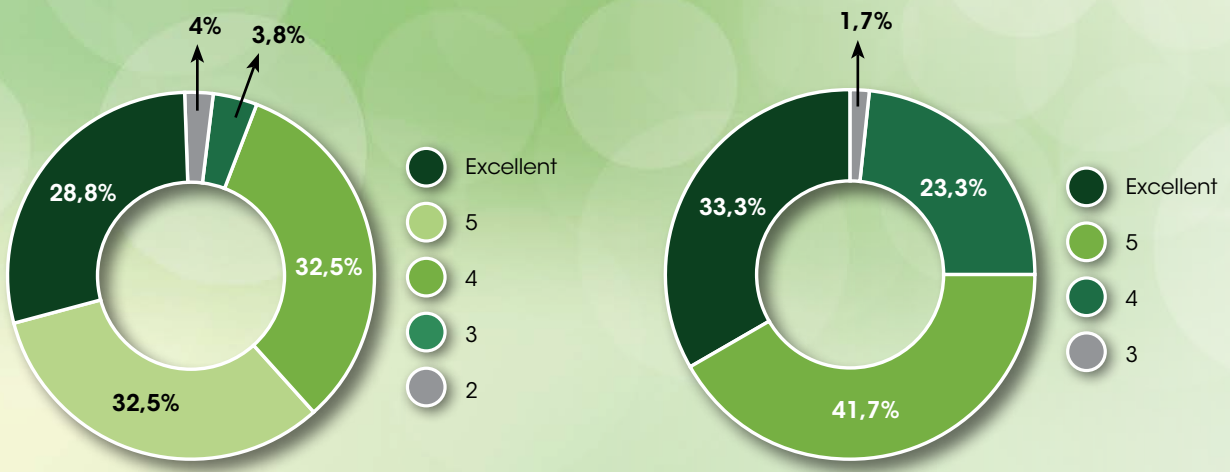
Asked about their perceptions of the two day conference, delegates found both days to be insightful and interesting and their experience of the days will definitely encourage them to attend the next conference, as well as recommend it to others.

## DAY 1 - 25 JULY 2024

## DAY 2 - 26 JULY 2024

### Overall SATISFACTION with conference

On a scale of 1 to 5 where 1 = poor; 2 = below average; 3 = average; 4 = good; 5 = very good; excellent



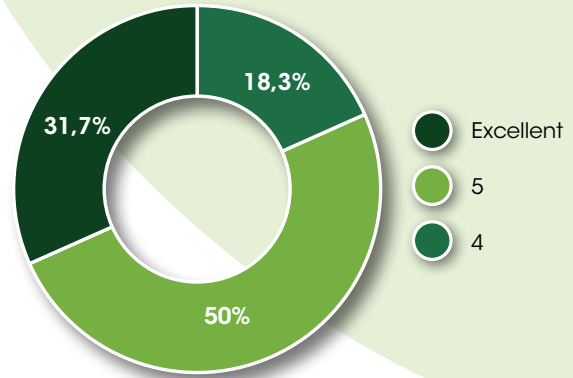
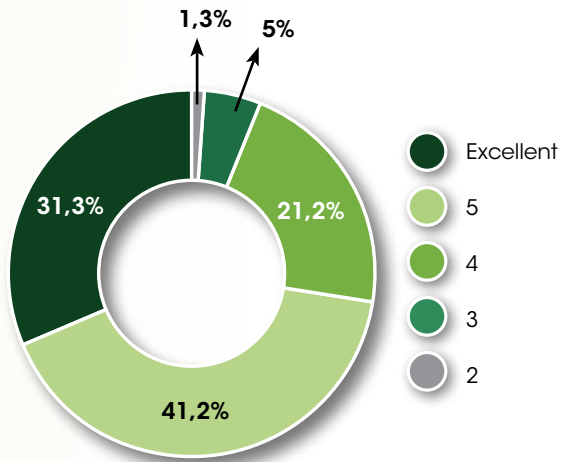


DAY 1 - 25 JULY 2024

DAY 2 - 26 JULY 2024

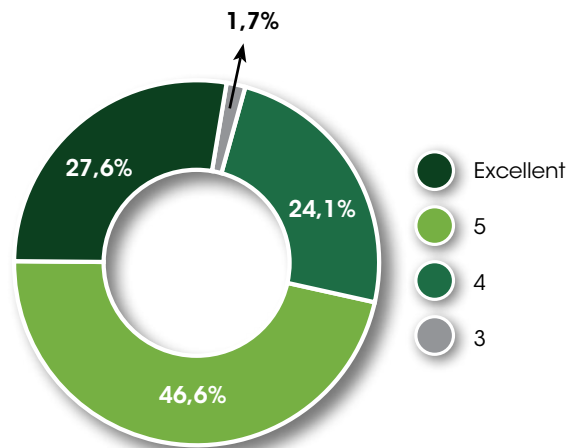
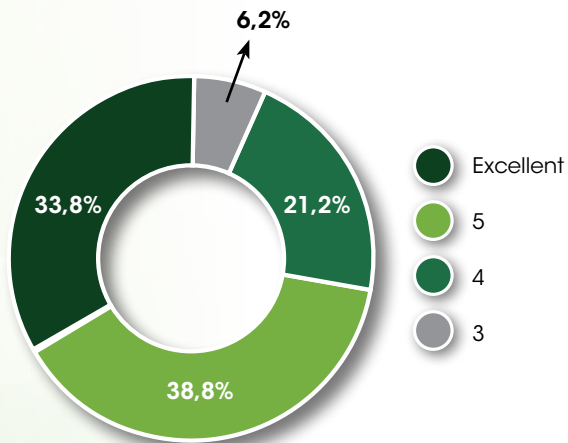
### Overall satisfaction with the **FORMAT** of conference

On a scale of 1 to 5 where 1 = poor; 2 = below average; 3 = average; 4 = good; 5 = very good; excellent

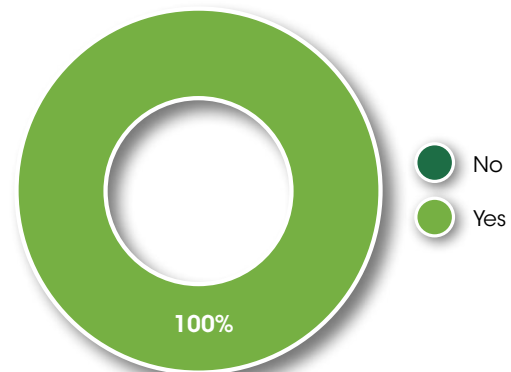
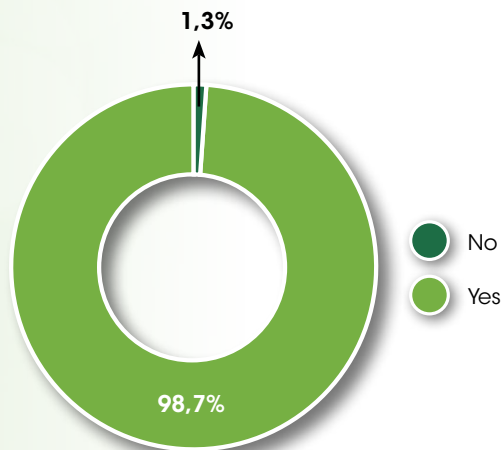


### Overall satisfaction with **PROGRAMME CONTENT** of conference

On a scale of 1 to 5 where 1 = poor; 2 = below average; 3 = average; 4 = good; 5 = very good; excellent



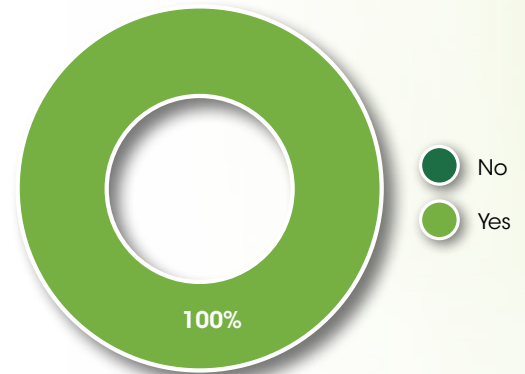
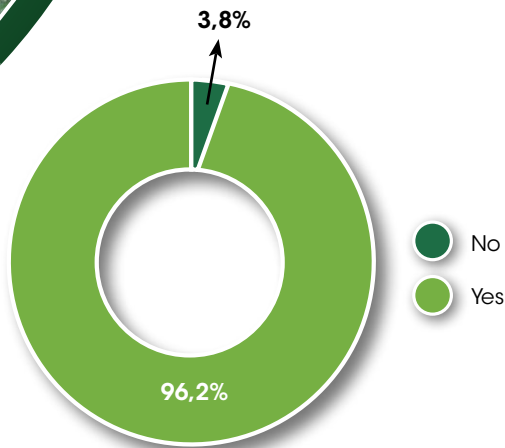
### Will you or would recommend someone else to attend the next conference?



DAY 1 - 25 JULY 2024

DAY 2 - 26 JULY 2024

Did the conference meet your expectations?



In addition, delegates were asked for suggestions for future conferences. These included:

- **Experience sharing:** including from communities who are harvesting plants; and from value chain actors who are examples of best practices.
- **Market information:** including available markets in detail, profiles of buyers / sellers in South Africa, and how to do

business with relevant corporates. Supply chains and opportunities in other markets, e.g. BRICS.

- **Use of essential oils for complementary medicines:** industry specific presentation from South African Health Products Regulatory Authority (SAHPRA).
- **Sustainability:** impact on industry of climate change, including wild harvesting

## 5 EXHIBITORS

Agricultural Research Council Testing Laboratories

Dinda

IKETLE Naturals

Moringa SA

National Metrology Institute of South Africa (NMISA)

Oil Grow

Precision Oil Laboratories

Senzubuhle

Talborne Organics

TUT/CSIR Cannabis & Hemp Research Hub

W.LAST



## 6 SPONSORS



### Global Quality and Standards Programme (GQSP)

The GQSP Programme is funded by the Swiss State Secretariat for Economic Affairs SECO and implemented by UNIDO. The objective of the GQSP is to improve framework conditions, contribute to greater international competitiveness and increase exports for SMEs, stimulate trade, thereby contributing to improved livelihoods and job creation and, ultimately, the Sustainable Development Goals (SDGs). The objective of the GQSP-South Africa project is to unlock the export potential of indigenous essential and vegetable oils.



the dtic

Department:  
Trade, Industry and Competition  
REPUBLIC OF SOUTH AFRICA

### the dtic

The Department of Trade, Industry and Competition of South Africa is responsible for the structural transformation of the country, towards a dynamic industrial and globally competitive economy; providing a predictable, competitive, equitable and socially responsible environment, conducive to investment, trade and enterprise development; broadening participation in the economy to strengthen economic development; continually improving the skills and capabilities of the dtic to effectively deliver on its mandate and respond to the needs of South Africa's economic citizens; coordinating the contributions of government departments, state entities and civil society to effect economic development; and improving alignment between economic policies, plans of the state, its agencies, government's political and economic objectives and mandate.



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER  
State Secretariat for Economic Affairs SECO

### Swiss State Secretariat for Economic Affairs SECO

SECO's Economic Cooperation and Development division is responsible for the planning and implementation of economic cooperation and development activities with middle income developing countries, countries of Eastern Europe and new Member States of EU. It coordinates Switzerland's relations with the World Bank Group, the regional development banks and economic organizations of United Nations. SECO is part of the Federal Department of Economic Affairs, Education and Research (EAER).



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

### United Nations Industrial Development Organization (UNIDO)

UNIDO is determined to carve its niche in contributing to Agenda 2030 and the SDGs by promoting and accelerating Inclusive and Sustainable Industrial Development (ISID) to achieve shared prosperity and environmental sustainability around the world. UNIDO is a key player in the fight to end poverty - while its activities contribute to numerous goals relating to people, prosperity, planet, peace and partnerships, its mandate is embedded in Sustainable Development Goal 9: build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.



### Southern African Essential Oil Producers' Association (SAEOPA)

SAEOPA was established in 2000 as a non-profit organisation to represent the interests of the essential and vegetable oils industry and to foster the growth of the regional natural ingredients industry by promoting the production, processing and export of these products. It represents all active role players in the value chain, including producers, processors, distributors, value-added products and ancillary support services. The Association aims to make a tangible and lasting contribution to social and economic development, with a bias toward women, the youth and rural areas.



**SAEOPA**  
**Southern African Essential Oil Producers**  
**Association**

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Scan to view 3<sup>rd</sup> SAEOPA  
conference video.

*This publication is sponsored by the project "Unlocking the export potential of essential and vegetable oils", within the framework of UNIDO-Swiss Secretariat for Economic Affairs SECO Global Standards and Quality Programme (GQSP).*

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