

Do natural ingredients pose a threat to sustainability?



from **Pharmaceutical & Cosmetic Review**
February 2021
by **New Media B2B**



The winner of this year's Coschem training in cosmetic science/P&C Review essay prize is Michelle Nott of Botanica Natural Products. To acknowledge Knott's achievement, a shortened version of her essay is published in this student focus and she has received a prize sponsored by P&C Review.

The term 'sustainability' has become a buzz word in the cosmetics industry and more recently, it has become conflated with the term 'sustainable development'.

According to a report entitled Our Common Future, sustainable development is defined as development that is able to meet the current needs of the population without compromising future generations to meet their own needs.¹ The key principles of sustainable development include the integration of environmental, social and economic concerns in all decision making for it to be truly sustainable.² As a result, the commercialisation of natural resources, also known as non-timber forest products, has gained increased popularity to meet environmental, social and economic challenges.³ Examples of natural resources commonly used in the cosmetics industry include:

- plant-based extracts (Ceratonia siliqua leaf extract is used as a skin brightening agent)
- vegetable oils (marula oil is commonly used for its skin moisturising benefits)
- essential oils (neroli oil is a popular cosmetic ingredient for its floral scent)
- butters (shea butter is used for its anti-inflammatory properties)
- clays (kaolin clay is used as a natural exfoliator)
- gums (xanthan gum is often used as a thickening agent).

Natural resource commercialisation

The core idea surrounding the concept of biodiversity-based commercialisation is that the resources are renewable and can be utilised to enhance rural livelihoods – economically, socially and physically – while fostering environmental conservation. The recognition and

admiration around natural resource commercialisation are derived from the numerous plant and animal products incorporated into the livelihoods of many underprivileged rural people, which allows these individuals to be better off than they were before.⁴ Thus, it is believed that because natural resource commercialisation allows communities to gain economically, this incentive would encourage them to preserve the resource base.^{6, 7, 8, 9, 10}

Most developing countries are poor with a large portion of the population living in poverty, making biodiversity-based commercialisation a viable income opportunity. It is seen as poverty-alleviation tool, which can aid in development that is both sustainable and achieves economic growth, social responsibility and environmental protection.

Given the increasing demand for natural cosmetic ingredients, natural resource commercialisation has played an important role in the cosmetic industry. According to ISO 1612 (guidelines on technical definitions and criteria for natural and organic cosmetic ingredients and products), natural ingredients are those obtained from plants (including fungi and algae), animals, micro-organisms or minerals.

Increased demand and overexploitation

The growing commercialisation of natural resources has resulted in the increased harvest of wild populations of fauna which has raised concerns of overexploitation.^{11, 12}

Palm oil, a vegetable oil collected from the seeds of oil palm trees, is a natural cosmetic ingredient which has not met the goals of environmental conservation intended by the trade of natural resources. The commercialisation of palm oil was initially seen as a poverty reduction scheme, but it has grown exponentially over the past five decades.¹³

From 1995 to 2015, palm oil production quadrupled annually from 15.2mn tonnes to 62.6mn tonnes. It is expected that by 2050, annual production will quadruple again, reaching 240mn tonnes. Although palm oil is not only used in cosmetics, it gained popularity in the industry because it blends well with other oils and acts as a good foaming agent in shampoo, liquid soap and detergents. Cosmetic manufacturers prefer it to animal tallow because of its natural origin, ease of application and low price, and it has been preached as a natural and 'sustainable' alternative to synthetic ingredients.^{13, 14}

However, as the palm oil industry expanded, conservationists and environmentalists started to raise concerns about its devastating effects on carbon emissions and wildlife habitat. Hectares of tropical rainforests were cleared for the plantation of oil palm trees, threatening endangered animal species such as orangutans. As the value of natural ingredients increases, the competition for resources increases which can lead to damaging environmental consequences.¹⁵

Beeswax, an animal derived product, is another natural cosmetic ingredient where sustainability issues have become a concern based on how the bees are kept and treated. Beeswax is often used as an emollient and humectant in body creams and a thickener in lipsticks and lip balms. In this instance, a natural ingredient can only be deemed sustainable if it has been grown, harvested and treated in the appropriate manner.¹⁴

Today, sustainability has gone from being a trend to an integral part of the cosmetic industry. As a result, cosmetic brands and manufacturers are requesting more information about their raw material supply chains and demanding transparency in terms of how the ingredients are made and what processes and people are involved.¹⁶

A positive push from consumers

Consumers are also more informed about climate change, the use of pesticides and chemicals, child labour and fair working conditions, ethical sourcing, and corporate social and environmental responsibility. Thus, consumers are the main role players in pushing

the cosmetics industry to become more sustainable. Some of the expectations from consumers is that packaging should be recyclable, reusable or biodegradable; raw materials should not be derived from endangered flora or fauna; manufacturing processes should produce minimal waste; and the use of synthetics should be avoided.

There is a strong public perception that natural ingredients are safer for human health and the environment and therefore suitable substitutes to synthetic products. A synthetic substance is a compound made artificially through chemical reactions. Synthetic products have largely been portrayed as bad amongst consumers, while nature-based ingredients are good. This is clearly not true as synthetics are used when concerns around sustainability are raised with regard to the supply of natural ingredients. For example, in Asia, the roots of the sassafras tree were highly valued for their hay-like aroma. This resulted in the mass removal of sassafras trees to extract the pleasant aroma from the roots for use in soaps and perfumes. To save the sassafras tree population, International Flavors & Fragrances developed a molecule that mimicked the fragrance derived from the roots, saving 110 000 trees from being destroyed per year.¹⁴ Therefore, the part of the plant or tree which is harvested to produce natural ingredients largely determines whether continuous offtake can be economically, socially and environmentally viable. It has been found that harvesting fruits, seeds and short-lived leaves has a higher potential for sustainable harvest compared to harvesting an entire plant, its roots, bark and bulbs.^{10, 31}

This shows that synthetic ingredients can play a vital role in the conservation of natural raw materials. Consumers should be educated on the use of alternatives when natural options pose a threat to wild populations.

Regulations and certification

The word 'natural' is unregulated in the beauty industry and therefore companies are free to define 'natural' as they wish and to market products as natural if they fit their definition of the term.¹⁷ Due to the fact that the term is unregulated, there is now an increasing demand for natural ingredients that are certified organic.¹⁸

'Organic' refers to how an ingredient is grown – it must be prepared and grown without pesticides, chemical fertilisers, growth hormones or antibiotics. According to ISO 1612 (guidelines on technical definitions and criteria for natural and organic cosmetic ingredients and products), organic ingredients are natural ingredients originating from organic farming methods or from wild harvesting in compliance with national legislation or equivalent international standards. For a product to claim that it is 'certified organic', it must meet a number of strict specifications that go beyond organic requirements. The formulation ingredients must still be grown and prepared under the same rigid conditions, but the concentration percentage of organic ingredients in the final product must be higher. Therefore, the term 'organically certified' should only be used if the product has been certified by an accredited certification body.

There are a number of certification bodies established internationally which have developed regulatory standards for natural and organic cosmetics. Ecocert, for example, supports and guides over 1 000 companies internationally through its certification processes for natural and organic cosmetics.²⁰ There are three main principles which underpin Ecocert's standards:

1. the use of ingredients derived from renewable resources that have been manufactured using environmentally friendly processes
2. a minimum threshold of natural ingredients from organic farming needs to be reached in order to obtain certification
3. an on-site audit is performed annually by an Ecocert auditor.²⁰

Under Ecocert standards, in order for a cosmetic product to be classified as organic, a minimum of 95% of the ingredients must be derived from natural sources and 95% of vegetable ingredients should be produced from organic farming practices.¹⁴ At least 10% of the entire product's contents should be sourced from organic production.

A closer look at the market

Given that there are regulatory standards which govern organic products, the market for natural and organic cosmetic ingredients is on the rise. Market research predicts that the global market for organic cosmetics will grow by 8% to 10% annually from 2016 to 2022.²¹ By the end of 2024 and 2028, the global market value for natural and organic personal care products is expected to be valued at approximately \$22bn and \$30bn respectively. Particularly in Europe and North America, the interest for organic and natural products has increased exponentially.²²

As the market for natural and organic cosmetics grows, particularly in developed countries, companies look to source natural ingredients from regions where they are grown abundantly and in a sustainable manner. The abundance of natural resources, however, is not evenly distributed across the globe, with developing countries taking the lead in terms of plant species diversity and supply. South Africa in particular is the third most biodiverse country worldwide, making it an attractive region to source natural ingredients to meet increasing consumer demand.²³

The South African cosmetics industry is growing at a retail level of 6% annually.²⁴ It is one of the biggest personal care markets on the African continent, employing 50 000 people and contributing R25bn at retail level and R5.2mn at a manufacturing level.

Currently there is a fundamental shift towards natural and organic cosmetic ingredients that support economic, social and environmental sustainability goals.²⁴ The total revenue produced from value-added bio-products in the domestic retail market was approximately R1.5bn in 2013. A total of 70% of these products were personal care products and cosmetics. The natural ingredients sector contributed R101mn to the GDP in 2014.²⁴ This amount has increased significantly as companies from all over the world look to South Africa for unique natural cosmetic ingredients in order to compete in the growing market.

Market requirements play a vital role in determining the sustainability of natural resources.⁹ It was found, as with palm oil, that natural resource harvesting can be sustainable until the demand for a product increases, leading to long-term ecological consequences if not managed properly.⁷ Researchers advise that in order to meet increasing demands, the following conditions need to be met:

- harvesting of wild products must be sustainable, ensuring that the population of the species harvested is maintained
- harvesting must not interact with secondary threats
- commercialisation of the product must be economically feasible
- the harvesters must reap the benefits from the commercialisation of the wild products
- income from natural resource commercialisation must be an incentive to conserve the resource being harvested.^{9, 25}

Many of these conditions have been enforced through an international agreement known as the Convention on Biological Diversity (CBD) and the Nagoya Protocol. The CBD was implemented in 1993 with the aim of achieving these three objectives:

1. the conservation of biological diversity

2. the sustainable use of its components

3. the fair and equitable sharing of benefits arising from its utilisation.^{26, 27}

The Nagoya Protocol was adopted in 2010 to further advance the third objective of the CBD. The Nagoya Protocol is the latest international environmental agreement that provides a solid legal platform for consolidating and developing modern biodiversity-based business.²⁹ The protocol does this by regulating the way in which natural resources are accessed and how the benefits of their use are shared, contributing to a fairer and more equitable economy that supports rural livelihoods and sustainable development.²⁶ To achieve this, countries and communities that provide natural resources must be included in the financial profits from product commercialisation. They must also be involved in receiving non-monetary benefits such as knowledge and skills transfer regarding the products derived from their natural resources.³⁰ Therefore, the Nagoya Protocol has become one of the main regulations and standards concerning ethical sourcing where economic, environmental and social sustainability are prescribed in order for natural resource commercialisation to commence. As a result, companies across the globe are increasingly sourcing natural cosmetic ingredients that are Nagoya compliant.

A truly social enterprise

Botanica Natural Products is an example of a cosmetic ingredient producer that offers a plant-based extract, which is Nagoya compliant. This extract is derived from the organic cultivation of the indigenous South Africa plant, *Bulbine frutescens*. The gel found in the leaves of the plant is used widely in the cosmetics industry due to its soothing, moisturising and natural anti-bacterial properties.

Botanica is based in a remote, rural part of Limpopo Province and, as a social enterprise, the company focuses equally on social development, environmental sustainability and financial viability. This is supported by academics in the field who have highlighted that organic farms are considered one of the most environmentally, socially and economically sustainable methods of production.³² To achieve this, Botanica offers sustainable employment to 25 employees who live within the surrounding villages and are the sole providers for their families. These employees ensure that cultivation is sustainable and that all waste plant material is recycled into organic compost used for agricultural production. Botanica also aims to offer this cosmetic ingredient as a carbon-neutral product. To achieve this, the company has established a plantation of 250 000 spekboom (*Portulacaria afra*) trees to offset its carbon emissions and reduce soil erosion.

The selection of natural raw materials for cosmetic applications is now being chosen on the basis that the environment is respected, energy and water consumption is reduced and emissions to water and air are minimised.¹⁴ Botanica is an example of one of the many producers of natural ingredients which have incorporated the social, environmental and economic aspects of sustainability into its business model. This is becoming more apparent as new cosmetic ingredients derived from agricultural-based raw materials enter the market.¹⁴ Therefore, to ensure sustainable practices are maintained, natural cosmetic producers are moving away from wild harvesting and investing in organic cultivation to meet increasing demands.

Conclusion

With the international demand for natural ingredients reaching an all-time high, natural resource commercialisation has become an integral part of the cosmetics industry. As consumers become more conscious of sustainable environmental, social and economic development, ethical natural ingredient sourcing is paramount.

Global regulatory frameworks and certification standards have been introduced to ensure sustainability is achieved. Previously, the environmental impact of natural ingredient commercialisation was the key focus of sustainability, but today, the social and economic components have been incorporated into the definition. Therefore, companies across the globe have adopted a holistic view that embodies the multiple dimensions of sustainable development.

Even though there are examples of natural ingredient commercialisation being unsustainable in the past, today consumers are demanding transparency throughout the value chain which ultimately helps to ensure environmental, social and economic responsibility in the cosmetics industry.

The cultivation of biodiversity-based ingredients is proving to be a viable approach to ensuring the long-term conservation and sustainability of the species harvested. In this way, environmental integrity is maintained, and economic and social upliftment can be achieved as the supply of raw material is guaranteed through agricultural production. This is increasingly adopted within the cosmetics industry to ensure that natural ingredient supply is sustainable.

Wild harvesting can also be sustainable given that the population of the species harvested is monitored and maintained. In such cases, caution should be exercised regarding the seasonal timing of harvest, timing of harvest in the plant life cycle, frequency of harvest, size of individuals harvested, intensity of harvest, method or tools used when harvesting and part of the plant harvested.

The use of natural ingredients does not pose a threat to sustainability if the requirements and regulations described are followed. With consumers demanding verification of economic, social and environmental sustainability, natural ingredient producers are required to follow the necessary protocols to meet these conditions. Thus, safeguarding the sustainability and transparency of natural ingredients supplied to the cosmetics industry. •

References available on request



Palm oil is popular in cosmetics because it blends well with other oils and acts as a good foaming agent

ABOUT THE AUTHOR

Michelle Nott graduated in 2018 with a master's degree (cum laude) in environmental science from the University of Cape Town. She is passionate about ethnomedicine and the use of African medicinal plants in cosmetics and pharmaceuticals. Nott has been employed by Botanica Natural Products as a relationship manager since 2019 and is based in Johannesburg.



This story is from:

Pharmaceutical & Cosmetic Review February 2021

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