GREEN COSMETICS: THE PUSH TO SUSTAINABLE BEAUTY

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INTRODUCTION

In the cosmetics industry, there are currently a number of green technology options. Natural cosmetics that are environmentally friendly can be made with these solutions. There is also a lot of study being done on how to adopt new ecologically friendly technical solutions. It is feasible to examine a broad definition of cosmetics based on their intended use and to distinguish conventional cosmetics from green cosmetics based on their composition and manufacturing process. Green Cosmetics are the utilization of natural components of the environment which guarantee environmental conservation. It is also known as Bio-cosmetics or Eco-friendly makeup are cosmetics that are generally manufactured using all natural, non-toxic ingredients. Many green cosmetics use naturally occurring mineral ingredient for colouring and sun-protecting purpose. These products generally are manufactured in environmentally sustainable way. Many companies use petrochemical ingredients derived from petrol, non-renewable raw materials and economically volatile resources.\[1,2]\n
The future keywords of the cosmetics sector are “sustainability”, “natural/organic”, “care”, “ethics”, “e-commerce”, “social beauty”, “personalization”, and “safety”. A cosmetics can be consider “green” if its formulation contains active ingredients derived from plants, such as minerals and plants, and not analogous active ingredients chemically reproduce in the laboratory. It is preferable if it is produced in an environmentally friendly manner, using processing methods that respect nature and organic crops. Green products are not all the same. It's important to understand the differences between natural ingredients, natural origins, and organic ingredients. Natural components are chemical substances that have not been treated by mechanical, manual, naturally generated solvent, or gravitational techniques, such as dissolving in water, heating to remove water, or extraction from the environment.\[3,4\]
In the realm of green cosmetics, new trends have emerged in recent years, such as nutricosmetics, which are nutritional supplements used for hair, skin, and nails to achieve beauty from inside. Nutricosmetics products, often known as "Beauty Supplements," are the culmination of three fields of research: food, pharmaceuticals, and personal care. They're soft or firm gels, capsules, pills, syrup, candies, or sachets with a rich amount of hyaluronic acid, minerals, vitamins, or plant extracts that can help with personal care.\cite{5,6}

**A short history of cosmetics**

Cosmetics have originated from ancient Egypt. They were used for a variety of reasons, the most important of which were hygiene and health benefits. Cosmetics that have health benefits or that fight skin ageing are relatively new approaches to cosmetics. Albert Kligman coined the term "cosmeceuticals" (a mix of "cosmetics" and "pharmaceuticals") in 1984 to provide an authoritative definition of goods with both cosmetic and therapeutic value.\cite{1}

Natural materials and additives are becoming increasingly popular these days. This is especially true in the case of cosmetics. The detrimental impacts of synthetic materials on health and the environment have become more apparent, which has resulted in a rise in popularity. At the moment, marketing trends are leaning toward natural cosmetics that are linked to a healthy lifestyle and relate cosmetic product use to good eating habits. Cosmetics’ importance has waned in recent decades on a societal level. Most products, such as soap, shampoo, toothpaste, and other similar items, have become part of our daily hygiene routine, with most significant preferences based on price rather than product environmental friendliness. A similar effect can be seen with sunscreens, which are required for skin protection. Makeup is becoming a normal part of everyday life; it is a tool for achieving a confident appearance. Consumers employed natural materials for cosmetics and to improve their appearance until recently, according to our ethnobotanical knowledge. However, as healthcare issues became more widespread and interest in skincare (mostly due to UV radiation) grew, the necessity for much more efficient plant extracts became more apparent. As a result, we should expect eating habits and cosmetics trends to diverge in the future, with each showing a different trend.\cite{5,6}

**Sustainable development in the view of cosmetics industry**

The cosmetics business is a significant economic sector in Europe, with thousands of enterprises employing over half a million people. Each year, approximately five billion units of cosmetic items are sold in the European Union, totalling 63 billion euros (Cosmetics
Europe, 2013). Despite the fact that conventional, lower-cost cosmetic products with synthetic ingredients still have a larger global market share, Jones and Duerbeck (2004) found in their survey that natural products are expected to grow at an annual average rate of 8–25 percent, compared to a lower increase of 10–30 percent for synthetic products.\[7\]

**Advantages**

1. **Environmental Responsibility** - One of the main benefits of sustainable products is their kinder environmental impact. Many petrochemicals found in traditional cosmetics are harmful pollutants that harm both the environment and our bodies. As we becomes more ecologically aware, consumer demand natural, low-polluting products.

2. **Increased Effectiveness** - Natural & oleochemicals are less likely to induce skin irritation or allergic responses. Take, for example, glycerine, a natural palm oil derivative. Glycerine a natural oleochemical that has all of the potency of synthetic compounds without any of the toxicity.

3. **Long Term Health** - While petrochemicals may produce immediate results, their long-term effects on people and the environment can be extremely harmful. By opting for sustainable cosmetics, you can avoid the stress and uncertainty that comes with using hazardous, synthetic products and instead invest in your long-term health and attractiveness.

4. **Natural Product are more Transparent** - Many green cosmetics are more transparent about their product’s ingredient list. Transparency is important when it comes to what you put into your skin.

5. **Undergo Ethical Production** - Brands that sell natural beauty products usually do so using ethical and sustainable methods. Buying green cosmetics can encourage a more sensitive approach to such products. These can jumpstart novel ways of creating products that don’t harm the environment.

6. **Gentle to The Skin** - Natural skin products like cosmetics are, in general, gentle to skin. Natural is not all-good by default, most skin care products that use such ingredients are painless.

7. **Mostly Cruelty-Free** - Natural products generally use cruelty-free methods for testing and production. Cruelty-free means products does not use animals for testing. In most cases, natural cosmetics will be cruelty-free because ingredients themselves are good grade.\[8,11\]
Disadvantages
1. High degree of variability in natural materials.
2. Structurally more complex.
3. Extraction process very complicate and high cost
4. Mostly have no fragrances.\cite{9,11}

Natural ingredients use as

- **Moisturizing agent:** Emollients, occlusives, and humectants are examples of skin moisturising agents. Emollients moisturise and soothe the skin by coating it in a protective film. They aid in the reduction of flaky skin and roughness. Shea, cocoa, kombo, murumuru butters as well as almond, avocado, argan, olive, rapeseeds, castor, coconut, primrose, raspberry, palm, broccoli, pomegranate and sunflower oils, are utilised as emollients. Occlusives provide an epidermal barrier that prevents water loss through the epidermis and controls keratinocyte proliferation. Oils and waxes like coconut, jojoba, olive oils, as well as candelilla and bee wax, are utilised as occlusive moisturising agents. Coconut and castor oils can be used as both emollients and occlusives. Water-loving moisturising compounds known as humectants draw moisture out of the dermis and into the stratum corneum while also binding water vapour from the environment. Humectants are moisturising agents such as Sorbitol, honey, glycerine, hyaluronic acid, and glycerol.\cite{10,12,13}

- **Barrier repair agent:**– Skin barrier protects against infections and limits transepidermal water loss. Essential fatty acids, phospholipids, ceramides, phenolic compounds, tocopherols, and cholesterol are some of the barrier repair agents. Linoleic acid has a higher linoleic acid to oleic acid ratio, which means it has a better skin barrier. Because it is a fundamental component of the stratum corneum's lipid matrix, it improves the skin barrier's permeability. Oleic acid breaks down the epidermal barrier, allowing other bioactive compounds in plant oils to pass through more easily. The stratum corneum also contains cholesterol and ceramides, which are essential lipids. Ceramide has a positive impact on skin firmness and plumpness. The physical and functional integrity of the skin barrier is harmed when a ceramide cream is applied topically. Fatty acids found in several natural oils play an important part in the skin barrier's maintenance. Omega-3s can be found in flaxseed, walnut, and chia oil, while omega-6s can be found in grapeseed, safflower, sunflower, blackcurrant seed, evening primrose, and borage oil.\cite{10,13}
Skin lightening agents: Skin lightening treatment reduces melanin level. Skin whitening agents either inhibit tyrosinase and melanosomes or increase epidermal turnover. Ethnic variances, chronic inflammation, hormonal changes, and UV exposure are just a few of the factors that can cause hypo- or hyper-pigmentation. Citrus extracts, kojic acid, licorice extract, white mulberry extract, bearberry extract, Indian gooseberry, vitamin C, vitamin B3, hydroquinone, retinoids, resveratrol, and alpha- and beta-hydroxy acids are all typical active components.\textsuperscript{[10,13]}

Anti-Inflammatory ingredients: Exogenous stimuli can influence wound healing, skin ageing, inflammatory dermatoses, and skin cancer. The inflammatory response, which offers tissue repair and infection control, is triggered when the skin barrier is damaged. Initially, keratinocytes and innate immune cells (such as leukocytes, dendritic cells, and mast cells) are activated, and cytokines (such as IL-1, IL-6, and TNF-) are produced, attracting immune cells to the injury site. Finally, reactive oxygen species (ROS), elastases, and proteinases are created. As a result, inflammation plays a role in the development of acne and is responsible for discomfort, swelling, and redness in the skin. Some anti-inflammatory foods include licorice root, turmeric, oats, chamomile, and nuts.\textsuperscript{[10,12,13]}

Sunblock ingredients: UV radiation is classified into three types based on wavelength: UV-A (320–400 nm), UV-B (280–320 nm), and UV-C (100–280 nm). Depending on the strength and spectrum of UV radiation, it can induce edoema, erythema, hyperpigmentation, photoaging, immunological suppression, and skin cancer. Continuous UV exposure can result in pigmentation, lesions, sunburn, dark spots, collagen fibre breakdown, wrinkles, photoaging, and cancer. Fibroblasts and keratinocytes are both harmed by UV-A photons. The most active component of solar radiation is UV-B, sometimes known as burning rays. It has the potential to cause immunosuppression and skin cancer by direct and indirect actions on DNA and proteins. They are powerful mutagens that have the potential to cause cancer and immune-mediated diseases. Phytochemicals found in aloe vera, green tea, coconut oil, grape seeds, and ginger help to prevent skin cancer and photo ageing.\textsuperscript{[10,13]}

Use of natural renewable raw materials
Respecting this fundamental principle is essential if we are to develop new ingredients which satisfy green chemistry. In 2010, approximately 40% of ingredients from renewable plant-
based raw materials was used in the formula. These biodegradable substances can be used for everything from skin and hair care to colouring and make-up. The following are some of the most common chemical families found in cosmetics.

- **Polysaccharides** - Numerous polysaccharide derivatives proposed by various suppliers are used in cosmetics. In many hair care formulas, cellulose and guar derivatives (ethers and cationics) are employed as components (shampoos, protection of sensitive hair). Carboxymethyl-cellulose is used as a thickening agent. Hyaluronic acid or even polysaccharides rich in fructose are very effective ingredients for skin care providing hydration and enhancing mechanical properties.[14,15]

- **Oligosaccharides** - The family of alkyl polysaccharides represents non-ionic amphiphilic compounds of renewable origin which are very interesting for cosmetic applications, especially shampoos. The longest chains can be also used as emulsifiers.[14,16]

- **Lipids** - For their physical-chemical qualities, this broad family of renewable materials, primarily derivatives of natural fatty acids, in particular esters such as triglycerides, is widely utilised in cosmetics. Making emulsions and powder dispersions, as well as contributing to skin protection and hydration, are their key interests. The ceramide family is an example of an essential family for skin and hair protection.[14,17]

- **Polyols** - Glycerine is an essential structure in skin hydration and in the preservation of skin mechanical properties (elasticity in particular). Sorbitol is also a crucial renewable raw material for the production of ascorbic acid (vitamin C), a key active ingredient in anti-aging and whitening products.[9,14]

- **Amino acids** - Amino acids and peptides are also used as ingredients or raw materials to access renewable ingredients such as N-ε-laurayl-Lysine; this very soft feel white pigment is supplied by Ajinomoto and used in make-up products.[14,18]

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Food</th>
<th>Bioactive molecules</th>
<th>Bioactivity</th>
<th>Cosmetics Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Green tea</td>
<td>Catechin derivative (e.g., epicatechin, epicatequinagalato, epigallocatechin, and)</td>
<td>Free radical scavengers.</td>
<td>Green tea extract has a long-lasting moisturising action, reduces skin roughness and</td>
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<tr>
<td>Plant/Extract</td>
<td>Constituents</td>
<td>Properties</td>
<td>Benefits</td>
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<tr>
<td>Coffea Arabica</td>
<td>Proanthocyanidins, quinic acid, caffeic acid, and chlorogenic acid.</td>
<td>Antioxidant properties.</td>
<td>Extracts of Coffea Arabica brighten the skin and improve wrinkle, fine line, and pigmentation in patients with actinic damage.</td>
<td></td>
</tr>
<tr>
<td>Vitis vinifera</td>
<td>Stilbenes (e.g., resveratrol), proanthocyanidins and procyanidins.</td>
<td>Antioxidant properties.</td>
<td>UV light-induced skin ageing is inhibited by vitis vinifera extracts.</td>
<td></td>
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<tr>
<td>Pomegranate</td>
<td>Ellagic acid, punicalagin, and punicic acid.</td>
<td>Antioxidant, antifungal, and anti-inflammatory properties.</td>
<td>Pomegranate extract helps to prevent wrinkles.</td>
<td></td>
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<tr>
<td>Glycine max (soybean)</td>
<td>Isoflavones (e.g., genistein).</td>
<td>Antioxidant properties.</td>
<td>UV-induced oxidative DNA damage and skin photodamage are reduced by glycine max extract.</td>
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<tr>
<td>Aloe vera</td>
<td>Aloesin, mucopolysaccharides, and amino acids (e.g., arginine, histidine, threonine, glycine, serine, and alanine).</td>
<td>Antioxidant, anti-inflammatory, and water-retention properties.</td>
<td>Skin lightening, elasticity improvement, and wrinkle reduction.</td>
<td></td>
</tr>
<tr>
<td>Citrus limon</td>
<td>Flavanones (e.g., hesperidin), citral, D-limonene, and β-pinene.</td>
<td>Antioxidant properties.</td>
<td>Citrus limon extract has anti-aging and depigmenting properties.</td>
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<tr>
<td>No.</td>
<td>Plant/Insect</td>
<td>Key Compounds</td>
<td>Properties/Effects</td>
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<td>8.</td>
<td>Opuntia ficus indica</td>
<td>Linoleic, oleic, and stearic acid.</td>
<td>Stimulate cell renewal, supporting skin moisturizing and collagen production. The extract of Opuntia ficus indica has antiaging benefits for the skin, hair, and nails.</td>
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<tr>
<td>9.</td>
<td>Ficus carica</td>
<td>Ficin and phenolic compounds.</td>
<td>Antioxidant properties. Ficus carica extract enhances skin lightening, lowers sebum production, exfoliation, hyperpigmentation, wrinkles, acne, and freckles, and restores epidermal regularity.</td>
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<tr>
<td>10.</td>
<td>Cynara scolymus</td>
<td>Phenolic compounds.</td>
<td>Scavenging of reactive oxygen species (ROS), anti-inflammatory effects, and regulation of anti-aging genes. Cynara scolymus extracts have a photoprotective action and improve skin elasticity and roughness.</td>
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<td>11.</td>
<td>Carica papaya</td>
<td>Flavonoids (e.g., kaempferol, quercetin, myricentin, and glycosides), phenolic acids (e.g., ferulic acid, caffeic acid), cysteine endopeptidases.</td>
<td>ROS-scavenging effect, and anti-inflammatory effect. Carica papaya extracts have antimicrobial properties, as well as reducing skin erythema and wound debridement.</td>
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<td>12.</td>
<td>Glycyrrhiza glabra</td>
<td>Flavonoids (e.g.,</td>
<td>Antioxidant, Glycyrrhiza glabra</td>
<td></td>
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<td>13. Theobroma cacao</td>
<td>Polyphenols (e.g., flavan-3-ols, proanthocyanidins, anthocyanins) and methylxanthines (e.g., theobromine and caffeine)</td>
<td>Photoprotective effects of theobroma cacao extract, as well as regulation of collagen I, III, and IV, and glycosaminoglycan synthesis.</td>
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<tr>
<td>14. Prunus dulcis</td>
<td>Triterpenoids (e.g., urosolic, betulinic, and olenolic acids), catechin, flavonol glycosides, phenolic acids (e.g., protocatechuic acid and vanillic acid), phytosterol, fatty acids, and lipid soluble vitamins.</td>
<td>Eczema and pimples are reduced with Prunus dulcis extract. Almond oil softens, nourishes, and strengthens hair.</td>
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<tr>
<td>15. Coconut</td>
<td>Fatty acids (e.g., myristic, lauric, and palmitic acids).</td>
<td>Coconut oil hydrates the skin, lowers protein loss in the hair, is a good exfoliant, and can also be used as a deodorant. Coconut milk reduces black spots and softens the skin.</td>
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Marketed formulations

- Rice

**Emulsifier:** Rice bran oil Rice bran oil was chosen for its skin-soothing, emollient, and hydrating characteristics. It is mostly composed of unsaturated fatty acids such as oleic acid (38.4%), linoleic acid (34.4%), and -linolenic acid (2.2%), as well as saturated fatty acids such as palmitic (21.5%) and stearic (2.9%). Unlike most refined vegetable oils, unrefined rice bran oil has a large unsaponifiable fraction (up to 5%), which is mostly made up of sterols (43%), triterpene alcohols (28%), 4-methyl sterols (10%), and other less polar components (19%). -sitosterol, campesterol, stigmasterol, squalene, and -oryzanol are all phytosterols. Although rice bran oil includes a little amount of tocotrienols (particularly β and γ), it is naturally high in tocopherol. Rice bran oil is used in the cosmetic industry in sunscreen formulas, anti-aging and skin-lightening products, and skin disease treatments. Fatty acids (2 g) and polyglyceryl-3 (1:1 molar ratio) were cooked in a pressure tube at 160 °C for 6 hours with magnetic stirring and microwave irradiation. Using a monomode reactor, microwave irradiation was performed. The maximum internal pressure was measured and kept below 1 bar using an internal IR sensor. The mixture was then cooled to room temperature. Without any further purification, the product was recovered and used. To neutralise any unreacted acids that may be present, arginine (approximately 1%) was added. A microwave-assisted irradiation approach was used to create a natural surfactant with O/W emulsifying characteristics.\(^5,13,20\)
• Grapes

The winery industry generates large amounts of solid waste. Namely, over 30% of grapes used finish as waste. Grape pomaces (10%–20%) and stems (2–8%) are the two most common by-products. These waste by-products are not considered hazardous. Grape seeds include 30 percent neutral polysaccharides, 20 percent acid pectic components, 15 percent insoluble proanthocyanidins (tannins), lignin, proteins, phenols, and important fatty acids. Grape pomace can be utilised in a variety of processes due to its composition, such as the extraction of polyphenols (anthocyanins, flavonols, phenolic acids, and resveratrol) and grape seed oil, as well as the fermentation of citric acid, methanol, ethanol, and xanthan gum. From grape pomace, Martinez et al. created a cascading biorefinery platform for extracting polyphenol, volatile fatty acids, polyhydroxyalkanoates, and biomethane. The polyphenols were first extracted using supercritical CO2 extraction (SCE) using ethanol as a co-solvent, and then compared to a traditional methanol extraction. Anaerobic acidogenic digestion created volatile fatty acids, which were then used to make biotechnological polyhydroxyalkanoates. [19,21,22,24]

• Orange
Oranges are by far the most widely grown commercial citrus fruit in tropical and subtropical locations around the world. When oranges are processed, a substantial amount of by-products (about half of the fruit) are produced, mostly consisting of peels, pulp, and seeds. Over 1 million tonnes of orange peel waste (OPW) is created annually from the production of fresh juice. The value-added substances that can be recovered from OPW include essential oils (D-limonene), pectin, dietary fibres, proteins, enzymes, citric acid, flavonoids, carbohydrates, and ascorbic acid. To extract essential oils and pectin from orange and lemon peels, Fidalgo et al. used microwave hydrodistillation and microwave extraction with hydrodiffusion and gravity. Essential oils act as antibacterial, antimycotic, antiviral, and antiprotozoal agents, and pectin is used in various food products as it acts as a hydrocolloid. Microwave Hydrodiffusion and Gravity (MHG) was used to extract essential oils, which was compared to steam distillation. Later, leftover plant water collected following MHG extraction was employed as a solvent for extracting polyphenols and pectin from MHG solid residues. Ultrasound-assisted extraction (UAE) and traditional methods were used to extract polyphenols. The extraction of polyphenols in the UAE was significantly more efficient. Pectin was extracted using both traditional and microwave-assisted methods (MAE). MAE resulted in a higher pectin yield and a significant reduction in extraction time.¹⁹,²¹

- Olives

Extra-virgin olive oil (EVOO) is at the heart of the Mediterranean food pyramid, and the American Food and Drug Administration officially recognised its health benefits. EVOO production has steadily increased during the last few decades. Olive tree pruning biomass (OTPB), olive leaves, olive stones, pomace, and olive mill wastewaters (OMWWW) are all by-products of olive oil production. Because of the high polyphenolic concentration in production wastes, they have a significant phytotoxicity, and their disposal raises
environmental problems. Olive leaves are a mixture of leaves and short branches produced during olive tree trimming, as well as the harvesting and cleaning of olive fruit before oil extraction. Among the phenols identified are flavones (luteolin-7-glucoside, apigenin-7-glucoside, diosmetin-7-glucoside, luteolin), flavonols (rutin), flavan-3-ols (catechin), substituted phenols (tyrosol, hydroxytyrosol, vanillic acid, and caffeic acid), and secoirid (oleuropein). Oleuropein is the most common phenol, and it is being explored extensively for its promising effects on human health and medical potential. It's a powerful antioxidant with anti-inflammatory, anti-cancer, anti-viral, and other health-promoting properties. Sahin et al. optimised the extraction of total phenolic content (TPC) and oleuropein from olive leaves using a solvent-free microwave-assisted extraction method. Olive pomace can be made using two different olive oil extraction methods: two-phase and three-phase extraction. The residual oil extraction (2-3 percent w/w of olive pomace) is frequently followed by the removal of crushed stones from the olive pomace. Phytochemicals present in olive pomace include tocopherols, flavonoids, quercetin, cinnamic acid, peptides, and phenolic compounds. Schievano et al. extracted polyphenols and mono/polyunsaturated fatty acids using SCE and ethanol as a co-solvent. Unsaturated fatty acids, squalene, and polyphenols were abundant in the freeze-dried extract, with di-hydroxytyrosol being the most common. The extraction was followed by thermochemical (oxidation or pyrolysis) recovery of energy, biofuels and materials.[19,21]

- Clay minerals

Clay minerals can be applied topically for dermatological protection or cosmetic purposes. Creams, powders, and emulsions are cosmetics that are applied to the body's external areas to improve, modify, and/or preserve the skin's physico-chemical conditions. Because of their
high absorption levels of substances such as greases, pollutants, and other impurities, clay minerals are used as functional components in hair care cosmetics and skin care mask compositions. As a result, they're indicated for treating inflammatory skin conditions like seborrhoeic dermatitis, psoriasis, chronic eczema, and acne. In the case of hair care, sulfur-containing minerals are regarded as an effective therapy for dandruff and seborrhea when used in shampoo formulations. By absorbing or reflecting UV light, clays and clay minerals can act as natural UV-protective agents in sunscreen formulations. Hoang-Minh et al. looked into the protective properties of kaolin, smectite, mixed-layer series-dominated clay, and mica-dominated clay against UV radiation in the range of 250–400 nm because of the bulk Fe2O3 content. In addition, UV protection is dependent on the expandability of the clay or a mixture of clay minerals and mixed ointment. In addition to their direct use as sunscreens, clays and clay minerals are used as delivery methods in cosmetic goods to improve the stability of organic sunscreens like PABA (p-amino benzoic acid, a UV-B absorber in the range of 200–313 nm). These novel methods also open up new possibilities for the employment of clay in this industry as a viable, effective, and cost-effective way to preserve other chemical filters.[23]

CONCLUSION
Sustainability is a relevant topic in all fields from the perspective of economic, environmental and social impact. Regarding cosmetic products developed by the cosmetics industry, environmental pillar has to be taken into consideration as the most striking factor. Green Cosmetics has many beneficial effects to human. Many different kinds of cosmetics are being prepared using the natural ingredients as Eco-friendly products which also has less side effect on skin. Green Cosmetics is widely growing and glowing across the whole world.

Future scope
Sustainable cosmetics manufacturing has a bright future ahead of it, as people's awareness of beauty products, their impacts, personal care, health, and lifestyle are expected to grow.

REFERENCES


18. Burnett CL, Boyer I, Bergfeld WF, Belsito D V., Hill RA, Klaassen CD, et al. Safety...


