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## Avinash Kumar



*Avinash Kumar has completed his Ph.D. in International Investment Law from the Dept. of Law & Governance, Central University of South Bihar. His research work is on "International Investment Agreement and State's right to regulate Foreign Investment." He qualified UGC-NET and has been selected for the prestigious ICSSR Doctoral Fellowship. He is an alumnus of the Faculty of Law, University of Delhi. Formerly he has been elected as Students Union President of Law Centre-1, University of Delhi. Moreover, he completed his LL.M. from the University of Delhi (2014-16), dissertation on "Cross-border Merger & Acquisition"; LL.B. from the University of Delhi (2011-14), and B.A. (Hons.) from Maharaja Agrasen College, University of Delhi. He has also obtained P.G. Diploma in IPR from the Indian Society of International Law, New Delhi. He has qualified UGC – NET examination and has been awarded ICSSR – Doctoral Fellowship. He has published six-plus articles and presented 9 plus papers in national and international seminars/conferences. He participated in several workshops on research methodology and teaching and learning.*

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## **“SUSTAINABLE COSMETOLOGY: COSMETOLOGY, POLLUTION AND ENVIRONMENTAL LAWS IN INDIA.”**

AUTHORED BY - ANUSHKA SONAVANE

5<sup>th</sup> Year B.A. LL.B. Student, SVKM'S Pravin Gandhi College of Law

### **ABSTRACT:**

The article delves into the complex nexus between cosmetology and environmental law in India, scrutinising the environmental impact of cosmetic production, usage, and disposal. It examines the chemical composition of cosmetics highlighting the risk possessed to ecosystem and human health. With the help of relevant case laws and regulatory framework, the article elucidates legal perspective on mitigating environmental degradation caused by cosmetic industry. Emphasising water and air pollution, it discusses landmark judgements which underscores Judicial Activism and Environmental Protection. Additionally, it outlines key Environmental Regulations, including Environmental (Protection) Act, 1986 And the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. The article advocates for sustainable practices to harmonise cosmetic innovation with environmental conservation in India.

**Keywords:** *Cosmetology, Environmental Law, India, Pollution, Regulations.*

### **INTRODUCTION:**

In India, with the growing concerns over skin care and makeup, individuals tend to invest highly on cosmetology. However, their cosmetic choices exhibit huge ecological implications. From vibrant colours of botanical extracts to shimmering allure of mineral pigments, the world of cosmetics beckons with the promise of transformation and self-expression. However, behind the allure of products lies a complex chain of environmental challenges, beginning from resource extraction and production process to waste generation and pollution. Thus, highlighting the need for sustainable approach and rules and regulations to combat the same.

### **Definition:**

The definition of cosmetics in India, as per *The Drugs and Cosmetics Act 1940 And Rules*

1945<sup>1</sup>- “Cosmetic is defined as an article meant to be rubbed, sprinkled, poured, or applied to the part of the human body or for cleansing, beautifying, enhancing attractiveness, or altering the looks. The cosmetic product does not come under the preview of the drug license.”

### **UNDERSTANDING COSMETOLOGY AND ENVIRONMENTAL IMPACT:**

To understand the intricate dynamics between cosmetology and environmental impacts, a comprehensive chain of industrial dynamics must be taken into consideration.

The initial stage of the cosmetic industry lies in sourcing raw material. To produce products for different skin needs, formulation of synthetic chemicals, natural extracts, and functional additives, each chosen for its specific need are taken into amalgamation. The environmental footprint laid down by cosmetology encompasses entire process of creating a perfect cosmetic formulation.

The extraction of raw materials such as petroleum derivatives, minerals, and botanicals, entails resource intensive processes that often entail habitat destruction, deforestation, and biodiversity loss. Moreover, the manufacturing phase, characterised by energy-intensive operations and chemical synthesis, contributes immensely to the greenhouse gas emission, air pollution and resource depletion.

While the use of plastic is important for the preservation and marketing purpose. It creates a massive impact on the marine ecosystem, giving rise to marine pollution, landfill, and resource depletion. Research also indicates that plastic microbes used in exfoliating, scrubs, and personal care products immense threat to aquatic ecosystem, resulting in accumulation and ingestion by marine organisms.

Lastly, the disposal of cosmetic products at end of their life, Cycle present challenges in waste management and pollution prevention, non-biodegradable ingredients, and packaging. Minerals in the environment for extended period, results into soil contamination, contributing to ecosystem degradation.

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<sup>1</sup>[https://cdsco.gov.in/opencms/opencms/system/modules/CDS.CO.WEB/elements/download\\_file\\_division.jsp?nu\\_m\\_id=OTIyNw==](https://cdsco.gov.in/opencms/opencms/system/modules/CDS.CO.WEB/elements/download_file_division.jsp?nu_m_id=OTIyNw==)

## **CHEMICAL COMPOSITION AND EFFECT ON ENVIRONMENT:**

To create a cosmetic product, the chemical composition and formulation plays a particularly vital role. The ingredients used to enhance product efficiency and sensory appeal possesses risk on environmental health and biodiversity. The commonly used preservative such as parabens and formaldehyde releasers intended to prolong shelf life and prevent microbial growth, have implicated in destruction to endocrine system in aquatic organism and accumulation in environmental matrices. Similarly, phthalates, ubiquitous in fragrances possess grave concern to the ecosystem and has adverse effects on the reproductive health of wildlife.

Furthermore, the persuasive use of microplastics in exfoliating scrubs and cosmetic formulation has emerged as a pressing environmental issue, with these non-biodegradable particles, infiltrating, aquatic habits, bio accumulating in food chain, and possessing threats to marine organism.

## **WATER POLLUTION:**

Chemicals used in cosmetic industries are often discharged into water bodies possessing grave to aquatic ecosystem and human health. An important case that highlights the consequences of industrial pollution on water body is the case of '*The Vapi Industrial Pollution Case, 2004*<sup>2</sup>'. In this landmark case, the Supreme Court intervened to address the rampant industrial pollution in Vapi region of Gujarat, including discharge of toxic effluence, river, and groundwater sources. The courts directives led to the establishment of wastewater treatment facilities and stringent regulatory framework to curb pollution, setting a precedent of judicial activism and safeguarding water resources from industrial contamination.

Studies have identified a plethora of chemical contaminant in cosmetic effluence, including heavy metals, surfactant, microplastics organic solvent. This pollutant can disrupt aquatic ecosystem, impairing the health of fish, amphibians and other aquatic organism compromising water quality for the downstream users. Additionally, research indicates that certain chemicals commonly found in cosmetics such triclosan and oxybenzone exhibit toxicity to aquatic organism and may bio accumulate in food chain forcing long-term ecological risk.

Additionally, inadequate waste-water treatment infrastructure also possesses a huge problem,

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<sup>2</sup> <http://www.indiaenvironmentportal.org.in/files/Vapi%20industry%20NGT%201Apr2014.pdf>

allowing pollutants to permit water bodies, unchecked the absence of regulatory enforcement for compounds the issue enabling non-complaint Industries to discharge and treated effluence with impunity. However, proactive measures such as implementation of liquid discharge system and adoption of eco-friendly production technology. Technology offers viable solution to mitigate water pollution from cosmetic industries.

### **AIR POLLUTION:**

The emission of air pollutants during manufacturing process, transportation activities and energy consumption stages creates an adverse effect on the atmosphere resulting into air pollution.

An important case that highlights the impact of industrial emission on air-quality is '*The Delhi air pollution case, 2019*<sup>3</sup>'. In this landmark Supreme Court of India interval to address the severe air pollution crisis afflicting the national capital region, Delhi by Vihar emissions, industrial pollution and agriculture burning. The courts directives led to imposition of regulatory measures including implementation of emission, standard closure of polluting industries and promotion of cleaner production technologies, this case highlights the role of judicial activism and safeguarding public health and environment in case of air pollution. During the Manufacturing stage, Cosmetic industries often emit harmful chemicals like volatile, organic compounds, particular matters, nitrogen oxide, sulphur dioxide. These chemicals have a harmful effect on the environment.

To overcome these challenges, regulatory framework such as *Air (Prevention and Control of Pollution) Act, 1981*<sup>4</sup> and *National Clean Air Programme (NCAP)*<sup>5</sup> have been instituted to mitigate air pollution from industrial sources including the cosmetic industry. These initiatives emphasise on adoption of cleaner, production, technology and Sustainable transportation practises to air-pollution and safeguard public health.

### **PACKAGING AND PLASTIC POLLUTION:**

The cosmetic industry is a major contributor to plastic pollution, producing over 120 billion units of packaging annually worldwide, a substantial portion of which is not recyclable. In the

<sup>3</sup> M.C. Mehta vs Union Of India on 2 September, 2019 AIRONLINE 2019 SC 1025

<sup>4</sup> <https://cpcb.nic.in/displaypdf.php?id=aG9tZS9haXItcG9sbHV0aW9uL0dTUj02RS5wZGY=>

<sup>5</sup> <https://prana.cpcb.gov.in/>

United States alone, nearly 7.9 billion units of rigid plastic were manufactured for beauty and personal care products in 2018. This issue is expected to worsen, given the projected growth of the global cosmetics market to reach approximately US\$ 560.50 billion by 2030. Unfortunately, many cosmetic products utilize plastics other than recyclable types #1 and #2 for their packaging, exacerbating the problem of plastic pollution<sup>6</sup>.

With the rise in consumerism, the cosmetic industry has experienced significant growth in both consumer quantity and demand for cosmetic products, leading to socio-environmental impacts. Plastic and microplastic pollution, particularly attributable to the cosmetic industry, has emerged as a pressing environmental concern. Microplastics are defined as plastics ranging from 5 mm to 0.1  $\mu\text{m}$ , which are generally too small to be filtrated by wastewater treatment plants and will end up disseminating in water bodies and marine life.

Being so small, sea animals can ingest microplastics and this will end up affecting marine food chains, leading to decline in marine biodiversity and adversely impacting biodiversity<sup>7</sup>.

Plastics exhibit traits that are detrimental to the environment, such as their resistance to breaking down naturally and their capability to attract persistent organic pollutants (POPs). This is deeply concerning because the buildup of POPs on microplastics heightens the likelihood of causing irreversible damage to marine ecosystems. Furthermore, the proper disposal of residues generated during the manufacturing process of cosmetics, such as substances derived from petroleum, dyes, heavy metals, parabens, sulphates is crucial to minimize adverse ecological impacts.

The use of parabens derived from oil as preservatives in cosmetics has raised health-related and environmental concerns on their immediate and prolonged effects on human body and environment. The environmental impact of parabens, sulphates and other oil-derived components and chemicals further compounds these concerns.

In recent years, there has been a significant surge in the usage of plastic, with an average yearly

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<sup>6</sup> Plastic Pollution Coalition. (2022, July 13). The Ugly side of beauty: The cosmetics industry's plastic packaging problem. Plastic Pollution Coalition. <https://www.plasticpollutioncoalition.org/blog/2022/1/25/the-ugly-side-of-beauty-the-cosmetics-industrys-plastic-packaging-problem>

<sup>7</sup> Nam H.C., Park W.H. Eco-friendly poly(lactic acid) microbeads for cosmetics via melt electrospraying. *Int. J. Biol. Macromol.* 2019;157:734–742. doi: 10.1016/j.ijbiomac.2019.11.240.

increase of 2.5%, leading to an estimated annual consumption of approximately 355 million tons. The biodegradability of products and materials emerges as a crucial factor in determining their environmental impact and friendliness, emphasizing the significance of managing materials with low biodegradability responsibly to avert environmental harm.

To combat plastic pollution in the cosmetic industry, concerted efforts are necessary to adopt sustainable practices, reducing plastic usage, and handling the waste from the production responsibly. By giving prioritizing environmental concerns and embracing innovative solutions, the cosmetic industry holds the potential to play a pivotal role in fostering a sustainable future.

### **REGULATORY FRAMEWORK AND LAWS IN INDIA:**

The regulatory framework and laws governing the cosmetic sector in India are primarily, the **Drugs and Cosmetics Act of 1940**<sup>8</sup> and the **Cosmetic Rules of 2020**<sup>9</sup>. The oversight of the cosmetics industry falls under the responsibility of the **Central Drugs Standard Control Organization (CDSCO**<sup>10</sup>), which operates under the **Ministry of Health and Family Welfare**. Compliance with these regulations is mandatory for all the cosmetics manufactured in India or imported into India.

Under the **Drugs and Cosmetics Act, 1940**,<sup>11</sup> cosmetics are defined as products intended for various purposes such as cleansing, beautifying, or altering appearance, and they encompass a wide range of products applied to the human body.

The rules and regulation regarding process for manufacturing cosmetics in India is outlined in the **Drugs and Cosmetics Rules of 1945**, which categorize cosmetics into 11 broad categories defined under **Schedule M-II**.

Factory premises intending to manufacture cosmetics must adhere to specific guidelines as outlined in Schedule M-II of the regulations. These requirements include maintaining hygienic conditions in the surrounding area of the manufacturing unit, ensuring the building is free from

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<sup>8</sup> THE DRUGS AND COSMETICS ACT, 1940 (23 OF 1940)

<sup>9</sup> THE COSMETICS RULES 2020

<sup>10</sup> Home. (n.d.). <https://cdsco.gov.in/opencms/opencms/en/Home>

<sup>11</sup> THE DRUGS AND COSMETICS ACT, 1940 (23 OF 1940)

pests and insects, and providing appropriate waste water disposal systems for residues. Additionally, staff must be free from communicable diseases and must be provided with necessary protective equipment and first aid facilities and have minimum education qualification as per the act as the product manufactured are in direct use of human and therefore discharge by the cosmetic manufacturing unit should not harm the surrounding environment and health of people.

Cosmetic products are to be labelled as per the Drugs and Cosmetics Rules of 1945. This include specifying the product name, manufacturing address, directions for use net contents, and any necessary warnings or cautions. Additionally, batch numbers and manufacturing license numbers and approvals of government regulatory bodies must be clearly stated on the label to help the customers identify the biodegradability of products, use of any sulphur or parabens or any other chemicals, to make informed decisions adhering to Indian standards set by the **Bureau of Indian Standards (BIS)**.

The Drugs and Cosmetics Act, 1940 is a punitive Act with the intent to punish and deter others engaging in non-compliance of the rules and regulation for the safeguard of environment. Failure to comply with any provisions or rules related to cosmetics under this Act may result in imprisonment for up to one year, a fine of up to Rs. 1000, or both upon first conviction. Subsequent convictions may lead to imprisonment for up to two years and a fine of Rs. 2000. Non-compliance with these regulations can lead to punitive measures, including imprisonment and fines, as per the Indian standards. Specific provisions, such as Rule 145D and 135A, prohibit the import and manufacture of cosmetics containing mercury compounds and as per the 6608:2004, each raw material must need a test of heavy metals, later it has been examined and should meet the following requirements. If these are tested early, the manufacturer may need not to test the finished cosmetic product for arsenic and heavy metals.

Additionally, environmental protection laws play a crucial role in regulating the cosmetic industry. The Constitution of India guarantees the right to a clean and pollution-free environment under Article 21, with legislative measures such as the *Water (Prevention and Control of Pollution) Act, 1974*<sup>12</sup>, and the *Air (Prevention and Control of Pollution) Act, 1981*<sup>13</sup>, addressing water and air pollution respectively. These laws establish standards for

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<sup>12</sup> Water (Prevention and Control of Pollution) Act, 1974

<sup>13</sup> Air (Prevention and Control of Pollution) Act, 1981

pollution control and provide mechanisms for enforcement through central and state pollution control boards. These laws set the standards for the discharge of pollutants into water bodies and the environment, and the laws empower pollution control boards at both the central and state levels to enforce compliance and rules for pollution caused by any factory or manufacturing unit.

The Factories Act, 1948, as amended in 1987, plays an important role in protecting the environment by regulating industries involving hazardous processes and use of chemicals. The purpose of the law is to protect the health and safety of workers, taking into account environmental issues arising from industrial activities and waste disposal.

In summary, the regulatory framework of the Indian cosmetics industry includes various laws and regulations aimed at ensuring product safety, quality and environmental sustainability. Compliance with these rules and regulations is critical for manufacturers and importers to operate legally, protect consumer health, and protect the environment.

### **FUTURE OUTLOOK AND RECOMMENDATION:**

#### **Embracing Biocosmetics: Pioneering Sustainability in the Cosmetic Industry-**

The use of Biocosmetics is a revolutionary shift in the cosmetic industry towards sustainability and environmental consciousness. Unlike conventional cosmetics made up of petroleum or mineral oil-derived ingredients, biocosmetics are made up using hundred percent natural components sourced from plants, animals, enzymes, microbes, organic crops and insects. The ingredients of biocosmetic are free from chemical fertilizers, harmful pesticides and chemicals like parabens and sulphur, making them not only safer for consumers health and body wellbeing but are also environmentally friendly as they are biodegradable and get easily composed.

In recent years, there has been a growing emphasis on replacing fossil-based ingredients in cosmetics like petroleum with natural alternatives like plants, herbs and enzymes. This shift has been driven by a desire to reduce environmental damage caused by using and manufacturing cosmetic product and promote healthier and greener alternatives for sustainable growth. Cosmetic giants such as The Estée Lauder Companies, Inc., L'Oréal SA, and others have redirected their focus towards using bio-based ingredients in their cosmetic product, recognizing the need to save the environment from cosmetic pollution.

Government should provide more support to biocosmetic product to make a supportive environment for large corporations to invest in research and development of sustainable practices and organic ingredients and should provide tax incentives to such bio degradable cosmetic products. Standard organic certification labels like **Ecocert, Cosmébio, NaTrue, USDA Organic, BDIH, and Soil Association** ensure the global commercialization of biocosmetic products, instilling more faith and trust of consumer in their authenticity and sustainability and spreading awareness.

Biocosmetic products offer many advantages over their conventional counterparts. Firstly, they are made using renewable, bio-based alternatives that are non-toxic and biodegradable in nature, reducing their impact on environment. Additionally, they promote waste reduction, recycling and low-energy consumption throughout their lifecycle further contributing to sustainability. Moreover, biocosmetics<sup>14</sup> are safer and more cost-effective to produce, source, and transport as compared to chemical alternatives.

Biocosmetics represent a significant step towards a more sustainable future in the cosmetic industry by harnessing the power of nature and embracing eco-friendly practices. cosmetic companies should produce biocosmetic products as they are environmentally friendly and have low manufacturing cost and are less toxic for human use.

#### Innovations in Treatment Technologies

In the cosmetic industry, the proper disposal and treatment of residues are crucial for minimizing and mitigating environmental risks. Cosmetics, due to their widespread use and external application, contribute significantly to pollutants in wastewater streams, posing immediate ecological threats. Unlike pharmaceuticals, which are metabolized, cosmetic compounds remain unchanged in the environment, highlighting the need for effective wastewater treatment to filter the chemicals and residues so that it does not enter the water stream and affects the biology.

Efforts should be made from the side of government, research institute and corporate companies on developing more efficient treatment technologies and waste management system to breakdown the complex particles into simpler forms and also to filter micro particles.

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<sup>14</sup> Goyal, N., & Jerold, F. (2021). Biocosmetics: technological advances and future outlook. *Environmental Science and Pollution Research*, 30(10). <https://doi.org/10.1007/s11356-021-17567-3>

Investment should be made in Common large-scale treatment approaches typically involving coagulation, biological treatment and dissolved air flotation. Methods and procedures to filter and remove dangerous micropollutants such as polycyclic musk, UV filters, heavy metals, and microplastics should be propagated to effectively treat the waste generated by cosmetic production<sup>15</sup>. By investing in innovative and sustainable treatment solutions, the cosmetic industry can minimize its environmental impact and contribute to a healthier ecosystem and sustainable future.

### Challenges in Micropollutant Removal: Enhancing Wastewater Treatment Processes

Cosmetic microplastic pollution has become a growing concern in recent years due to its widespread use and detrimental impacts on ecosystems. Microplastics are particles which range from 100 nm to 5 mm in size, are either formed from the breakdown of larger plastic materials or intentionally manufactured for various applications, such as cosmetics, cleaning products and detergents. Of particular focus are microbeads. Microbeads are plastic particles less than 5 mm in size, specifically designed for use in personal care products due to their durability and evenness of size.

Microbeads are valued for their shape and durability, making them efficient abrasive and exfoliating agents in cosmetic products. However, their non-biodegradable nature poses a significant environmental risk as due to their extremely small atomic makeup they surpass the waste treatment processing causing harm to human health and ecology.

Conventional wastewater treatment systems are not equipped to remove microplastics from the wast, allowing them to enter waterways and accumulate in various ecosystems, especially in marine environments posing serious threat to marine ecosystem.

Concerns are raised over the negative effects of microplastic use on marine life and system stability. The growing concern is the trophic transfer of microplastics by consuming these particles from aquatic organisms into humans through the food chain, leading to more ecologically challenging issues with potential risks to human health.

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<sup>15</sup> Okoye C.O., Addey C.I., Oderinde O., Okoro J.O., Uwamungu J.Y., Ikechukwu C.K., Okeke E.S., Ejeromedoghene O., Odii E.C. Toxic Chemicals and Persistent Organic Pollutants Associated with Micro-and Nanoplastics Pollution. Chem. Eng. J. Adv. 2022;11:100310. doi: 10.1016/j.ceja.2022.100310.

In the cosmetics sector, one way to deal with plastic pollution is to consider using biocosmetic products instead of synthetic ones and applying new methods and improved wastewater treatment plants, which are known to provide a way for the microbead particles to be filtered out and removed from the waste flow. Resolving this problem is essential for maintaining a balanced ecosystem and promoting sustainable development.

### **CONCLUSION:**

However, to conclude, the complex relationship between cosmetology and environment in India shows that we need to change our attitude towards cosmetic products and use them in a more ecofriendly way. Every step in the production process of cosmetic products is affecting our environment in a negative way. The raw materials used in the production of makeups can also lead to water and air pollution, unnecessary disposal of cosmetic products and use of so many nasty stuffs and chemicals in our skin creams.

One of the hazards associated with the use of cosmetic products, which are often manufactured with artificial additives, petroleum, and microplastics, is the impact on the ecosystem in addition to human health. The legal mechanisms that help regulate this risk factor and would seek to punish offenders include the *Drugs and Cosmetics Act of 1940* and the *Environmental (Protection) Act of 1986*. A series of path-breaking judicial pronouncements in this regard, such as the Vapi Industrial Pollution Case and the Delhi air pollution case, have demonstrated how the Indian judiciary has played a proactive role in dealing with environmental issues resulting from the cosmetic industry and expanding within the scope of *Article 21 – Right to live in a healthy and pollution-free environment*.

Supporting the production of biocosmetics and integrating cutting-edge treatment technologies into the industrial process are two significant actions to ensure a sustainable future. In fact, biocosmetics can act as an alternative to chemical and petroleum-based conventional cosmetics with their natural and biodegradable components. Likewise, improvements in wastewater treatment hold the potential to alleviate the threat that microplastic contamination poses to marine environments.

Government, research institutes, and corporate entities should actively collaborate in order to effectively respond to environmental challenges that the cosmetic industry raises. Making environmental issues a priority and using sustainable practices can result in creating a healthy

and pollution-free ecosystem and ensuring a sustainable future for future generations.

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