



# Biocosmetics: platform for sustainable economic development in Colombia

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## Biodiversity in Colombia

Colombia is one of the most megadiverse countries, ranking second in the world with more than 10% of the world's biodiversity on 0.7% of the planet's surface. Due to the 314 different ecosystems it possesses, Colombia ranks first in terms of the number of birds and species of orchids that it has. In addition, the country has approximately 41 000 vascular plants, 479 species of mammals, 1801 species of birds, 763 species of amphibians and 506 species of reptiles, and is one of the richest countries in aquatic resources.<sup>1-3</sup>

Despite this, there are significant threats to biodiversity in Colombia: habitat damage due to the transformation of ecosystems by agriculture or extractive industry; illegal activities, mainly armed conflict for more than 50 years<sup>2</sup>; and the lack of systems of information about biodiversity, creating profound weaknesses in the development of effective policies.<sup>1</sup> The main political initiatives that seek to generate a sustainable scenario for the use of biodiversity in Colombia are presented below.

## Institutionality and Policies That Favor the Industrial Use of Sustainable Resources in Colombia

For several decades, through the efforts of academic institutions and technology development centers, Colombia has been building research capacities around the characterization and evaluation of the potential use of resources derived from its biodiversity. However, there have been serious limitations to the appropriation of these advances by business and industry, mainly due to the absence of clear policies.

In recent years, this barrier has been overcome through the consolidation of an institutional framework and policies that aim to promote the sustainable industrial use of its natural resources, mainly through bioprospecting and biotechnology. Figure 1 summarizes advances in

Colombia's policies since 1982.

The Constitution of 1991 established the political initiatives in these areas. Art. 78 stated that the "State will plan the management and use of natural resources, to ensure their sustainable development, conservation, restoration or replacement" and Art. 81 established that the "State will regulate the entry and exit of the genetic resources and their use, in accordance with the national interest."<sup>4</sup> Also, in the same year, the National Program of Biotechnology was created, which favored investigation through the public resources managed by Colciencias.

It is also important to highlight Colombia's participation in the Convention on Biological Diversity (CBD), which has as its main objectives, biodiversity conservation, sustainable use, and fair and equitable sharing of the benefits of resource use.<sup>4</sup> Also, since 2006, biotechnology has become a fundamental pillar for the development and competitiveness of the country through government plans (National Development Plans - PND).

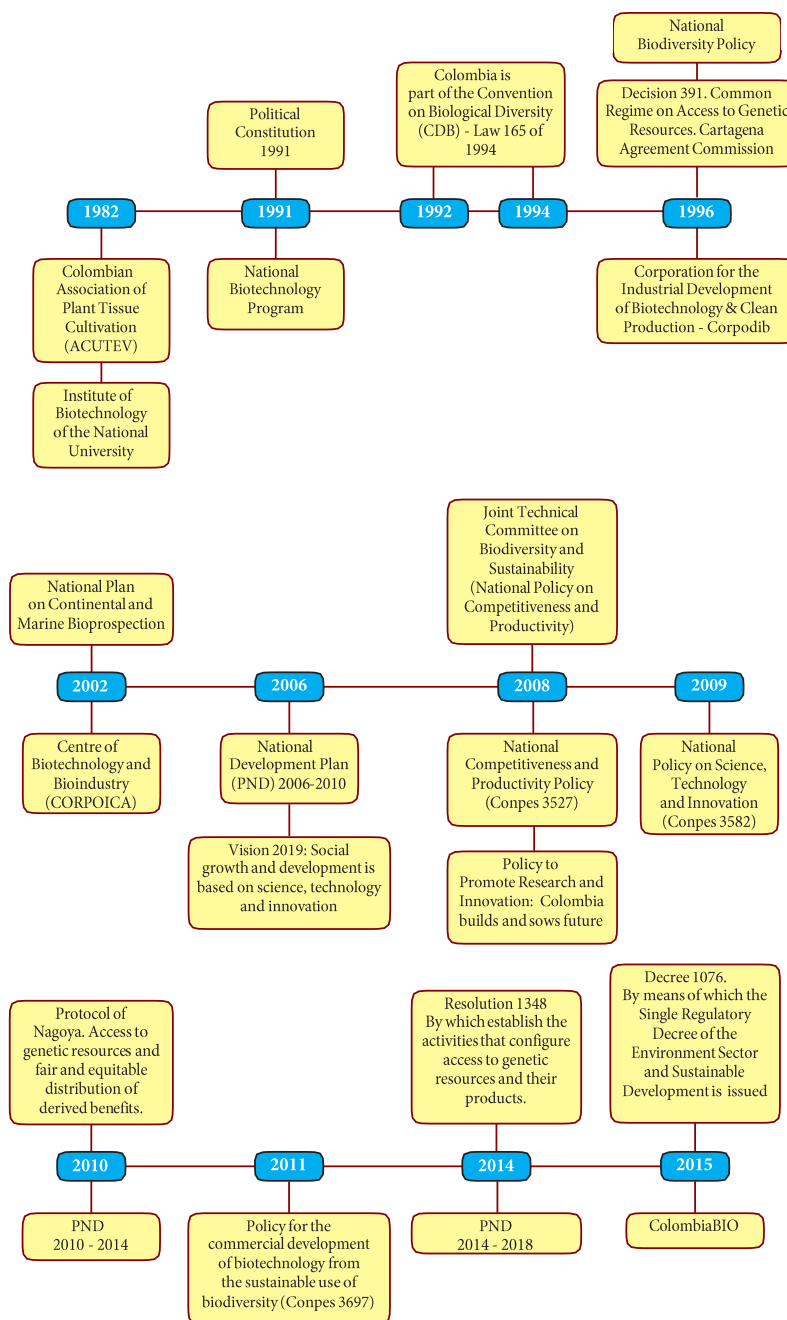
Access to biological resources<sup>5</sup> and genetics<sup>6</sup> is regulated by the CAN countries through the Andean Decision 391 of 1996. For Colombia, however, this issue remained fuzzy until 2014, when the national government, through the Ministry of Environment and Sustainable Development, created Resolution 1348: "Establishing the activities that provide access to genetic resources and their derived products for the implementation of Andean Decision 391 of 1996 in Colombia and other determinations." This has triggered the granting of at least three contracts for access to genetic resources for industrial purposes since 2015.

This resolution appears in the CONPES policy document No. 3697 of 2011 on biotechnology, which specifies initiatives to create the economic, technical, institutional and legal conditions. They allow the development of companies, and commercial products based on the sustainable use of biodiversity for commercial purposes,

specifically biological, genetic resources and their derivatives. The CONPES policy document will serve as the basis for new products for various industries such as cosmetics, pharmaceuticals, agroindustry materials and natural products, among others. Council National Policy on Economic and Social Policy<sup>4</sup> and the creation of the Colombia BIO Program aims to “provide conditions to know, value, conserve and promote sustainable use of the country’s biodiversity, contributing to sustainable and socially inclusive development.”<sup>5</sup>

Likewise, in 2008 the Productive Transformation

Program (PTP) was created by the Ministry of Commerce, Industry and Tourism (MCIT), which seeks to support, among others, the cosmetics and home care sector to position itself as a world-class sector. This program is committed to taking advantage of the opportunities derived from the country’s biodiversity for the use of natural ingredients, responding to one of the consumer trends of cosmetics in Colombia and the world, which are oriented towards health and well-being. For this market, the growth of at least 2.3 times the size of the sector is projected, “generating US\$8.9 billion in sales, and



**Figure 1:** Institutions and Policies for Promoting Sustainable Use of Biodiversity and the Use of Biotechnology.  
**Source:** Prepared based on National Council for Economic and Social Policy - CONPES, 2011.

multiplying its exports at least 4 times to export 27% of its production.<sup>7</sup>

### The Nature of Cosmetics

Biocosmetics are products which are composed of a high proportion of natural ingredients. In this sense, some certifications, like the Ecocert, recognize an ecological cosmetic to be one that has a minimum percentage of the vegetal ingredients, of which 10% must come from organic agriculture. In the case of natural cosmetics, at least 50% of the ingredients must be vegetables, of which at least 5% must come from organic farming.<sup>8</sup>

Highlighted among the benefits obtained from natural ingredients in cosmetic products are anti-aging activity, strengthening of skin barrier function, improved elasticity and recovery, reduction of pore size, reduction of lines, prevention of hyperpigmentation, and anti-inflammatory properties.<sup>9,10</sup>

In Colombia, some highlights of successful business experiences in the production of cosmetic raw materials or cosmetic products based on Colombian biodiversity, are:

- Ecoflora<sup>®</sup> Cares (<http://ecofloracares.com/>): Patented development of a natural blue dye obtained from the Jagua (*Genipa americana*) for cosmetic use. Its characteristics are light stability, high temperatures and pH, high coloring power, and its availability in liquid and powder form. In addition, its business model is based on working with local communities as a social responsibility practice.
- Kahai: Its development is based on the Cacay nut, native of the Colombian Amazon. Its virgin oil is extracted for cosmetic use for anti-aging of the skin and hair. It is rich in vitamin E, F, and retinol, and contains about 75% of linoleic acid, which provides the benefits of skin hydration, wrinkle reduction, firming, and elasticity, among others.
- Colororganics: Uses native seeds to produce dyes for cosmetics, food and textiles.
- Amazon Purity: Produces Sacha Inchi oil (*Plukenetia volubilis* Linneo) that possesses anti-aging properties, revitalizes the skin, and renews dry hair.
- Waliwa: Uses seeds, fruits and leaves of Colombian biodiversity such as *Annona muricata*, *Campomanesia lineatifolia*, *Campomanesia lineatifolia* and *Erythrina edulis*, which have anti-aging, revitalizing, nutritive and antioxidant properties. They are used in conditioners and creams for the skin and body.
- Green Andina Colombia: Provides raw materials of natural origin, such as extracts from the passionfruit seed (*Passiflora edulis*), mint leaf of Jamaica (*Satureja viminea*), and Palm oil (*Elaeis guineensis*),

among others, which have emollient, antioxidant, moisturizing, antiseptic and insect repellent properties.

In conclusion, Colombia has made significant progress overcoming the political constraints associated with the need for clarity regarding access to genetic and biological resources, as well as institutional strengthening that supports the sector in R & D processes. Based on this progress, challenges that are expected to be overcome in the years ahead include: the characterization of biodiversity with application potential for the cosmetics industry; the ability to design, develop and market products that use premium natural ingredients meeting the standards for safety, efficacy and stability required in Colombia and the world; as well as the establishment of natural raw material production processes using high quality standards.

In addition, the development of natural cosmetic raw materials is facilitating the social and sustainable development of peasant communities in the regions of the country that are being studied and developed in this field.

### Competing Interests

None.

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