

Green Marketing Model for Pigment Industry

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ABSTRACT

Due to pollutions in synthetic pigments industry, the entire world is shifting towards the manufacturing of natural pigments. The present article contains application of different natural pigments, which has huge demand in domestic as well as in foreign market. It is hoped that entrepreneurs, technocrats, existing units institutional libraries will find this article very useful.

Keywords: Green, Marketing, Model, Pigment

I INTRODUCTION

Madhya Pradesh pigment industries have come a long way. Today, Madhya Pradesh has a significant presence in production of basic organic, inorganic and natural pigment segments. Thus, by virtue of its diversity, the pigment industry bears a close correlation not only with the quantum of overall economic growth but also with the contents and quality of growth. On the one hand, the ranges of products of the industry's constituent segments are used in most productive activities, and on the other hand, the pigment industry's diversity relates to the pattern of demand to the changing standards of living.

To mainstream the environment is necessary to use the natural resources rationally. This would require improving the environmental governance by integrating green considerations into the development process. The government's reducing monopoly over the control of natural resources to ensure better public participation. Systems of governance need to be decentralized. The states and local bodies are given greater authority and responsibility with measures that assure accountability transparency and efficiency. This would require mainstreaming of the environment in the process of policy making. It is ensuring greater community participation.

A natural pigment can be defined as highly coloured substance used to impart colour to an infinite variety of materials like textiles, paper, wood, varnishes, leather, ink, fur, food stuff, cosmetics, medicine and tooth paste. The pigment is generally prepared by boiling the crushed powder with water.

II REVIEW OF LITERATURE

Pigment manufacturing was started in India in 1902 with only one pigment industry. After independence in 1947, the production of various pigments, such as titanium dioxide, ultramarine blue, chrome pigments, phthalocyanide blue, Prussian blue, zinc chrome basis lead sulphate and metallic pigments such as aluminum paste has already been started in India. In 1966 there were more than 50 major factories and more than 200 minor ones. In 1967, the total installed capacity was only 50,800 tones per year. In 1972, the

production touched 70,000 tones per year and today the Indian pigment industry can be said to be on a par with the pigment industry world wide. The large numbers of products manufactured in India are now marketed in other countries.

Industries can be broadly classified into non-hazardous waste and hazardous waste. Non-hazardous waste can be either biodegradable or non-biodegradable. The major industries in urban areas that generate substantial amounts of biodegradable solid waste are fruit processing, cotton mills, paper mills, sugar mills, and textile factories. The major generators of non-biodegradable industrial solid waste are thermal power plants producing coal ash, integrated iron and steel mills producing blast furnace slag and steel melting slag. Such non-ferrous industries as aluminum, zinc, and copper which produce red mud and tailings. The fertilizer and allied industries which produce gypsum. Some of the wastes generated by industries are deemed to be hazardous wastes because they contain substances that are toxic to plants and animals or are flammable, corrosive, explosive or highly reactive, chemically.

Natural pigments find use in the coloring of textile, drugs, cosmetics & food products. Natural pigments are environmental- friendly, for example turmeric (haldi), the brightest of naturally occurring yellow pigment is a powerful antiseptic which revitalizes skin, while indigo (Neel) gives a cooling sensation. Henna (Mehendi) was used even before 2500BC, while saffron (kesar) is mentioned in the bible. Some of the well- known ancient pigments include madder (Manjiph), a red pigment is made of the roots of the *Rubia tinctorum* L. blue indigo (neel) from the leaves of *Indigofera tinctorial* (Indian Indigo), yellow from the flower of the saffron plant (Kesar, *crocus sativus* L.) and from turmeric (Haldi, *curcuma longa*L).

III RESEARCH METHODOLOGY

Sample Area: Pithampur Industrial Area, Indore

Research Design: Exploratory Research

Type of research: - The present study is carrying a blend of descriptive and exploratory research.

Sampling plan: - Systematic Convenience sampling method will be used.

Sampling size: - Sample size would be 25 from Pithampur industrial area. The sample size is estimated on the basis of research area and topic.

IV OBJECTIVE

Study of shifting from synthetic pigments to natural pigments. (For making country independent and pollution free)

V PIGMENT SYNTHETIC VS NATURAL

Pigments are insoluble powders of very fine particle size i.e. as small as 0.01 micron which is used in paints, plastics, rubber, textiles, inks and other materials to impart colour, opaqueness and other desirable properties to the product. Pigments are both natural & synthetic in origin and organic and inorganic in composition. The oxides of iron, chromium, lead and other metals give a limited range of colour with good light fastness. However many of these, change colour with sulphur compounds found in urban atmosphere today, making them unsuitable with the growth of dyestuff industry. A range of pigments giving bright colours of good fastness properties were discovered. A new chromophoric system of phthalocyanine pigment was introduced in 1935.

Pigments find application in aqueous and non-aqueous paints, printing inks, paper coating, leather finishing, plastic products and other similar processes. The pigment may be used alone or incorporated with a white pigment such as zinc oxide, titanium dioxide or white lead as a means of controlling the opacity and the depth of shade required. Most of printing inks contain pigments and are used for the printing of metal foil, tin-plate, cardboard wrapping materials and so on. Pigments are extensively used in printing and textiles in combination with a resin binder. Pigments are incorporated in cellulose pulp to obtain colour paper. Similarly mass colouration of synthetic fibers, plastics and rubber is carried out. Pigments are also used in cosmetics, soap, wax, chalks, crayons, artist's colours.

(a) Natural pigments can be sorted into three categories:

Natural pigments obtained from

- Plants
- Animals
- Minerals.

(i) Natural pigments, obtained from plants- Almost all parts of the plants like roots, bark, leafs, fruits, wood, seed, flower etc produces different colors like red, yellow, blue, black & brown. It is interesting to note that over 2000 pigments are synthesized by various parts of plants of which only about 150 have been commercially exploited. Nearly 450

plants are known to yield pigments in India alone, of which 50 are considered to be the most important, ten of these are from roots, four from barks, five from leaves, seven from flowers, seven from fruits, three from seeds, eight from wood and three from gums and resins. Pigments for lipsticks are still obtained from annota seeds (latkan, Bixa orellana) and those for eye shadow from indigo (Neel). Lycopene a carotenoid pigment responsible for red colour in tomato, watermelon & carrot.

- (ii) Natural pigments obtained from animals- Cochineal (kirmaz) is a brilliant red pigment produced from insects living on cactus plants. Lac (Lakh) the encrusted twigs which are host to the larvae of the insect coccus lacca, were cut into pieces.
- (iii) Natural pigments obtained from minerals- Ocher is a pigment obtained from an impure earthy ore of iron or ferruginous clay, red (hirmaji, hematite) or yellow (ramraj, ralimonite).

VI SOURCES & APPLICATION

(a) Cosmetic

- (i) **Extract** - Aloe Vera, amla, apple, ashwagandha, arnica, avocado, beet, brahmi, bhringraj, cabbage, calendula, carrot, capsicum, chlorophyll green, cucumber, grape, ginger, green tea, henna, hibiscus, jatamansi, lemon, litchi, lotus, manjistha, methi, neem, orange, papaya, peach, pineapple, pomegranate, rose, rosemary, saffron, seabuckthorn, shikakai, spinach, strawberry, soy protein, sun flower, tomato, tulsi, turmeric, watermelon, wheat protein, yoghurt.
- (ii) **Powder** - Cream, calcium caseinate, gum Arabic, honey & sodium caseinate.
- (iii) **Oil** - Aloe Vera, amla, arnica, asiatica centella, bhringraj, brahmi, calendula, capsicum, carrot, grapes seed, hibiscus, jojoba, lemon peel, neem, shikakai, sweet almond, wheat germ.

(b) Food -

- (i) **Powder** - Aceroala, Aloe vera, amla, aniseed, annatto norbixin, ajwain, Apple, apricot, arrow root, banana, basil, bay leaves, beet root, besan, bishop seeds, bottle gourd, cabbage, cardamom, carrot, cashew kernels, castor, cheese, chickoo, cinnamon, cloves, coriander, cumin, cuisine, custard apple, date, fennel, fenugreek, fig, garlic, ginger, green chili, green grape, guava, honey, lemon, mango, marjoram, methi, mint, mushroom, mustard, nut meg, onion, orange, papaya, pineapple, posper, pumpkin, ragi, rosemary, sesame, spinach, tamarind, tomato, turmeric, vanilla, vermicelli, whey.
- (ii) **Oil** - Sun flower

(c) **Health-** Adaranga, adrak, agni-mantha, aja moda, ajowan, akarkara, akhrot, akola, aksbei, Amarpoi, amba haldi, ambergris, ambar, amla, amrul, amtavait, anchhu, anola black musale, aparajita, arakha, arjun, arjun bark, arjuna myrobalan, arkapatri, arni, assafoetida, asdhia, ashoka, ashwagandha, atis, ayapan, baboolseed, babul, bach, bada gokshura, baer, bagha tentuli, baheda, bakul, bana maricha, bandhuk puspi, Bansa, banslochan, bala simuli, balkanda, Barberry, bastard teak, bay- berry, bebati, Bengal currants, bhala bhadrina, bhant, bharangi, bhargi, bhataur, bhiringraj, bhui amla, bhui mandar, bhujpatra, bhunikusmanda, bhusanga, bidafil kand, bihidana, birhatta, birun, bishop's weed, bitter guard, black berries, black catechu, Blue berry, boaban, boka sangha, bol, bramhi, bonducella nut, brahmamanduki, brahmi, brihati, brungraj, bubaitulasi, butterfly pea, cacus grass, camphor, caraway, carrot, chalta, chamomile, chatium, Chatta, chhota dudhi, chhota nakh, chilla, china root, chironji, chita paru, chitosan, chitra, chitraka, chitrak root, chob chini, chorota, chukka, chunchu, cikura, coconut, cohiria, common fumitory, common milk hedge, coral, coriander seeds /dhania, corkwood, corn, country borage, cowrie, cucumber, curd, cuscus grass, dandelion, daruhaldi, devil's cotton, dhanantari, dhatura, dhub, digitallis, dikamali, dill, elephant or wood apple, dita bark, dodder, dog grass, doorva, drum stick / sargava, dudal, dudhi, energy brow, febrifuge, fenugreek, four- o- clock flower, fox gloves, foxnut, French marigold, gandha palas, gandha tamal, ganga, garmalu, genda, gendul, ghikanwar, gigantic swallowwort, ginger / sunth, girish Indian acalypha, gold thread, golden seal, goma, gooseberry, goraka / kokam, gorakh anli, gotaghanba, gotha great leaves, green tea, groundnut, guduchi/ giloy, gugal, guggul, guhalo, gular big, Gulcakri, gulkhairo, gulsakari, gum gulgul, gurmara, hakum, hansapasdi, harmal, harsighar, harjori, hasi sundi, hasti hatapuccha, karana palas, helio trope, hembane, henna, Himalayan silver fir, hingra, hohoba, holy basil / tulasi, Indian aconite, Indian alces, Indian beeci, Indian bread-shot, Indian cyperus, Indian filbert, Indian gamboga, Indian hemp, Indian kamala, Indian laburnum / amaltas, Indian madder, Indian mulberry, Indian night shade, Indian penny wort, Indian rhubarb, Indian senna, Indian sorrel, Indian sweet fennel, Indian white rose, indrajav, indramarish, ispaghula, issugul, jaggery palm, jaiaputa, jaiphal, jalpapra, jamun, jangliswan, jatamashi, java glangal, jawasa, jethimadhu, jhabuk, jhanjhanian, Jibanti, jira, jivanti, juani, jungali madan mastak, jungle aushbali, jujebe fruit, kabab chini, kaitha, kaiphal, kakamachi, kakhrona, kalasaka, Kalihari, kalmegh, kamalgundi, kamini, kanchan, kanda, kandari, kandurikabewl, kaniar, kantakari, kanta marish, kapas / cotton, kapur, karabir,

karad, karamarda, karanja, karanji, karchi, karela, karjiri, karpas, kasha marda, kasaturi, katha, kathkal, katkaranj, kawanch, khorasani, khurasani ajvayan, khus khus, kokam, kelendula, kelikadamba, ketaki, khair, khas, khunkharaba, king of bitters, kirikiri, korehijhar, kosum, kulthi, kumbhi, kurchi, kurum, kutki, labanga, lal chitarah, lavang, leavedalangium, Liguorice, lin seed tisi, liquorice root / mulethi, lobelia, long pepper / pipla, madhumalati, mahua flower, mahua gulli, mahul patta, maida, makhna, malanga, malabar nut, mamijava, mamira, mango / amra, manjistha, manjit, maqnkanda, marigold, marina shell, marsh mallow root, methi, mint, mitha zahar, mohta roots, morpankhi, moti, mudar, mugani, munga, musk dena, musk mallow, muskroot, mulathee, myrrh, naga feni, nagarmotha, nagkesar, nal, narangi, narakoli, nata karanj, neel, neerbrahmi, night jasmine, nilagiri, nilofar, nirbishi, niruri, noni, noni juice, nut grass, oembinatoin, olat kambhal, orange, palas, palmyra plam, panibela, papaw, passion flower, patherchur, pearl, pellitory, peppermint / pudina, pilijari, pit, pita jahni, pita papada, papara, pitapapara, pola, pomegranate / anardana, popaiyah, potato, prickly pear, psylium husk, pudina, pushkarmool, quince, ranga bana, Rangoon creeper, rakta pichhuli, rasna, rau, red creeper, red leadwort, red mango, red sander / lal chandan, revand chini, riha, rukuna, sada bihar, safed dhatura, safed musli + ashwaganda sugar free, safflower, sage Indian sarsaparilla, salap, salsaz, sana, sankhapushpi, sapra ghandha, sarivan, sata patri, saunf, schund, senna sopheta, serpentina chota chand, sevar, shankhapushpi, shatapusp, shiajira, shikari, shalparni, sharifa, siris, soanjina, somlata, sorrel, sowa, spirullina, sthala padma, sudarshan, sugandha bala, sugar apple, sunflower, sunsunia, Superb Lily, surba chala, surya mukhi, suvaga, sweet flag, sweet basil, sweet scented oleander, sweet wood, sweta siris, sweta sunarchhana, Syrian rue, tal, talimusli, talispatra, talmakhana, tejara, telugu kulanjan, thal sukhri, thelko, thornapple, thutia, thyme leave, tikora, tuta, true lemon grass, turmeric / haldi, two- flowered Indian madder, ulatkambal, urni, uturuli, velvet leaf, vidanga, vijasar, vilayti imli, white mulsberkry, wil cowrie fruit, water lily, wild mustard, whey annatto bixin , white leadwort, yam, yohimbe bark curcuma starch, zaminkand, zupha Indian atees.

(d) **Essential Oils, Aromatic Oils & Oil Resins –** Absolute lavender, Ajowan, almond oil bitter, almond oil sweet, amber attar, amber attar-II, amyris, angelica, anise, ansi seed, apricot, armoise, avocado, banzoin siam, basil, bay, benzoin extra, bergamote, betel, big eucalyptus, black pepper, blue chamomile, borage calamus, camphor, camphor powder, camphor tablets, capsicum oleoresin, caraway, cardamom green,

cardamom oil small, carrot seed, castor oil cosmetic grade, castor oil pharmagrad, castor oil tech. grade, cedarwood, chamomile oil – (roman, blue, germen) clary sage, clove, clove bud, coriander, coriander seed, curry leaf, cypress, dill seed, elemi, eucalyptus (citriodora), elemi oil Us, evening primrose, eucalyptus oil globulos, eucalyptus oil citriodor, fir needle, frankincense, german chamomile, garlic, glycerine, , ginger, ginger grass, grape fruit, grape seed, galangal, galbanum, geranium, ginger, celery seed, ginger grass, grape fruit, harsingar (parijat), hedychium (ginger lily), henna attar-II, heeng, holy basil, hyssop, jamrosa, jasmine sambac abs, jatamansi, jojoba, juniper berry, kalaunji, Kapoor kachri, karanj seed, kewra attar –I, khus (ruh), lavender, lavandin (Grosso), linalool ex-(basil, citerata), lemon (grass, eucalyptus, verbena), lichen, lime terpeneless, litsea cubeba, lotus Indian (attar), mandarin red, marigold, mitti attar (ruh-e-jannat), Melissa, menthe (arvensis, citrate, piperita), myrrh oleo, N-crude menthe, N – dementholised, N- menthol bold crystals, n – menthol fine flakes, n – menthol melted flakes, menthone 99%, methyl chavicol, motia II nutmeg, nagar motha, narakachur, neem, neroli, niaouli, olibanum, oil fatty, orange (bitter, sweet), oregano, palmarosa, parsley seed, patchouli, peppermint, petitgrain, pimento berry, pimento leaf, pimento berry, pine, pomegranate, pumpkin, red thymeoil 50%, rose, rose essential, rosemary, rosewood, sandalwood, spearmint, spikenard (jatamansi), sugandh (kokila, mantra), sweet fennel seed, tagetes, tea – tree, thuja oil, thyme, tomar seed, T.p.liquid oil 99%, turmeric, valerian, vetiver oil- I, wheat germ, winter green, yara yara powder, yarrow, ylang ylang, zafri astrar.

- (e) **Organic Crude Herbs** – Agar, ageda, ajmobar, ajmod, ajowan seeds, akkalkara mul, aloes, amaltas, ambahalder, ambachhal, amla, amruta guggaal, anantmool, ankdo, annatto seeds, anuir, apamarg, apiumgraveoens, apple, aprioht, aritha, arjun bark, arni mool root, ashok bark, atibalachikana, ativish, babchi, babul bark, babul pods, badiyan, baheda, bakayan (fruit), bala, banafshah, baru mool, beal fruit, beal mul, bealhal, belladonna leaf, bharangi mool, bhava, bhella, bhui – amla, bhoi-pathri, bidhara, bijasar, black piper, blackteal, chandan (swet), chavak, chitrak mool, chopchini, cinchona officinale, cinnamomum zeylanicum, curry leaf, dalchini, darbha daruhalder, dashmool, devdhar, dhamasa, dhana, dhatura phool, dhayati, dikemari, dudal, duudhi, elaiichi, ephedra, eranda root, ethyl acetate, euphorbia, gahula, galo, gandhprasarini leaf, garlic, garmola, ginger, glycyrrhiza, godambi, gokhru, Gorakhmundi, green chilli, guduchi, guggal gurma, haldercucurma longa, harde, haritaki, harrir, henna leaf, hing, indrajav, jambu seed amla, jarduha jatamanshi, jaypal, jivanti, jungle- mehti, jungle piyaz, jyatishmathi,

kada chhal, kadu, kakad, kakmachi, kakuani, kali draksha, kalihari, kali musli, kalmegh, kantakari, kapilo, kapur kachri, karela seed, kasni seed, karanja, kateli, kawach, kayphal bark, khadir bark, khadyanag, kher, khurasani, khus valo, kovarya seed, kuchla seed, kulinjan, kurchi, kusm phppl, kuth, kokhala, kutki, lajwanti, lashun, lemon, limbodi fruit, lindipiper, lobela, lodhra, makoi, male fern, mamejvo, manjistha, meda, methi seed, mochras, mulethi, musta, nagarmotha, nagkesar, neem bark, neem leaves, nirgundi leaf, nishot, nux vomica, ohtton seed, onion, orris, papaya beej, pashanbhad, patanga, pimlimul, pitpapdo, podophyllum, pudina, punamava, pushkarmula, putranjiva, rakta chandan, rakta rohida, rasna root, ratanjyot, rohitak, rose-wood, ruma mastaki, safed aghedo, saghurchota, sallai gum, sallaki, salmali, sandal, saptparana bark, sarpunkha, satodi, sau variali, scilla Indian, seena (pod, leaf), senega Indian root, shankhpushpi, shatapushpa, shatavri, sherdi mool, shikakai, shwagandha, sisam, somlata, stramonium leaf, suragavo bark, swet musli, tagar beej, tandalja mool, tejbai, trikatu, umbar bark, uplet, utkanta, valerian, vardharo, vavading, vidang, vidari kand, wild violet.

- (f) **Speciality Ingredients & Syergise Extracts** - Azadiritin, beta- carotene, colchicine, Curcumin – 95%, sennosides.

VII EMERGING HERBAL HUB OF INDIA

With 11 agro climatic zones out of the total 16 in the country, Madhya Pradesh is well suited for cultivation of large number of herbal plants. With nearly 91% area of the state under forest cover MP provides an excellent habitat for wild herbs. Madhya Pradesh has more than 300 species of wild herbs. Further the state forest has ample biodiversity of wild plants whose pigment potential is yet to be established and thus provides excellent research resources for the herbal industry. The key herbal collection centers of the state are situated at Shivpuri, Betul, Katni, Neemuch and Lalitpur. Together, along with Dhmttri (Chhattisgarh) these collection centers meet nearly 40% demand of the entire domestic herbal industry.

Ample availability of land for the cultivation of various herbs and already the mass cultivation of a number of species has been stated in the state. Herbal industry is labour intensive in nature and MP has ample availability of economic power. The strategic central location of the state facilities cost effective logistics and distribution function. The proximity of the state with key port enables exports of raw goods and finished product across the globe.

VIII CONCLUSION

Nowadays, fortunately there is increasing awareness among people towards natural products. Due to their non-toxic properties, low pollution and less side effects, natural pigments are used in day to day food products. Although the Indian subcontinent possesses large plant resources, only little has been exploited so far. More detailed studies and scientific investigations are needed to assess the real potential and availability of natural pigment yielding resources and for propagation of species in great demand on commercial scale. Biotechnological and other modern techniques are required to improve the quality and quantity of pigment production.

Due to lack of availability of precise technological knowledge on the extraction and pigmentation technique, it has not commercially succeeded like synthetic pigments. Also, low colour value and longer time make the cost of pigmentation with natural pigments considerably higher than with synthetic pigments.

It is time that steps are taken towards documenting these treasures of indigenous knowledge systems; otherwise we are bound to lose vital information on the utilization of natural resources around us.

To conclude, there is an urgent need for proper collection, documentation, assessment and characterization of pigment yielding plants and their pigments, as well as research to overcome the limitation of natural pigment.

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