

# **Environmentally friendly , eco-friendly Products, Natural Products, Biodegradable Plastics, Natural Dyes and Pigments, Jute Products, Natural Fibers**

**[Handbook On 100% Export Oriented Jute & Jute Products \(Eco  
Friendly Projects\)](#)**

**Author:** P.K. Chattopadhyay

**Format:** Hardcover

**Book Code:** NI6

**Pages:** 105

**ISBN:** 8186623000

**Price:** Rs. 695.00 **US\$** 100.00

Jute is a natural fibre obtained as an extract from the bark of the jute plant that grows like any other organic crop. This fibrous plant in earlier days was also used by the inhabitants as a delicacy that went along with their staple diet. Jute, the Golden Fiber as it is called, is the raw material used for making sacks world over. It is truly one of the most useful fibers gifted to man by nature, which is beautifully crafted in the form of handicrafts and many day to day products. Besides being the cheapest and the most important material of all textile fibers, it also provides work for millions of farmers, landless labourers, industrial workers and many others, both directly and indirectly. Jute is being cultivated in India for over centuries now. Its predominantly a crop of eastern India. Besides, there are several small scale industries in the decentralized sector producing handicrafts, decorative, twines, pulp & paper from jute and allied fibers and particle board from jute stick. India is recognized as the largest producer of raw jute and the biggest manufacturer of jute goods. There is tremendous capacity within people here to manufacture the widest range of products, tailored to customers demands. The country's modern and world class research & development facilities in the area of jute agriculture, product development & machinery design are used for developing high quality jute products matching the international standards. Indian Jute Industry has the capacity to produce and meet the International demand for food grade Jute bags and cloth. Food grade Jute Bags and cloth manufactured in India - are a boon in the context of global environmental and ecological concern. Indian food grade jute bags have a twin edged advantage: preservation of food in the most natural way. The jute industry can look forward to a brighter future provided urgent measure are taken to set the population of value added products in its programme for diversification. This book basically deals with jute cultivation, jute bags (gunny), jute shopping bags, jute garments, jute office stationery, jute decorative products, jute foot wear, jute brush for white washing, list of jute manufacturers in new Delhi, list of jute manufacturers in Panipat (Haryana), list of jute manufacturers in Ghaziabad (U.P.), Indian organisations for development of jute, new trends in jute blends. This book discusses with the modern scientific method of jute cultivation & processing into various products. Cost estimation for

different kinds of products has been presented considering the prevailing market conditions.

# Handbook on Biodegradable Plastics (Eco Friendly Plastics)

**Author:** NIIR Board

**Format:** Paperback

**Book Code:** NI26

**Pages:** 276

**ISBN:** 8186623531

**Price:** Rs. 600.00 US\$ 100.00

Plastic has brought immense benefits to the whole human race. The light weight, cheap chemical resistant and strong material has got almost omnipotent presence. When we talk of its strength we talk of the time till it survives and to everyone's knowledge plastic does not bio-degrade. Yes, plastic the greatest invention of mankind has the power to even destroy mankind. Plastic that is not biodegradable brings a lot of environmental issues. It deteriorates the ozone layer. For the most part plastic is produced from oil. The world is progressively running out of oil. Research says plastic brings number of harms not only to humans but also the entire cosmos. The plastic which cannot be recycled has to be disposed off in some or the other way. Let's say if we dispose in water it has the tendency to destroy marine life. So the only way left to reduce the ill effects of plastic is to use eco-friendly or biodegradable plastic. Biodegradable plastics are plastics that will decay in usual aerobic environments. These include plastics that are made from vegetable oil and other organic matter. The book, Handbook on Bio Degradable Plastics (Eco friendly plastics) is one of its kinds which give the information about biodegradable plastics. The book gives comprehensive information about Standard Methods for Biodegradation of Plastics, Commercialization of Eco-Friendly Plastics, and multipurpose exploitation of municipal solid waste (plastics), management of non recoverable plastic waste, guidelines to be followed in recycling of plastic and several other crucial topics required for the understanding of recycling of plastic. According to a report out of 200 million plastic produced in the world 26 million is produced by the United States and only 6%(approximately) of plastic waste gets recycled posing both a challenge and opportunity. Challenge in the sense that it is causing environmental issue and opportunity for the young entrepreneurs to penetrate in this sector. The book provides important and descriptive information on the whole topic of biodegradable plastic, the benefits and the techniques used. The book also contains information on topics arising social concern like present technologies for recycling of polyethylene terephthalate (pet) waste, how to minimise the impact of packaging materials on the environment and also provides information on new bio-degradable plastic, as business options for entrepreneurs. The book at the end contains a list of directory providing information on List of Plant & Machinery,

List of Raw Material, Plant/Machinery Suppliers, Overseas Suppliers of Machinery and Raw Material Suppliers.

**Natural Fibers Handbook with Cultivation & Uses**

**Author:** NIIR Board of Consultants & Engineers

**Format:** Paperback

**Book Code:** NI154

**Pages:** 560

**ISBN:** 8186623981

**Price:** Rs. 1,275.00 US\$ 125.00

Natural fibers production, processing and export are vital to the economies of many developing countries and the livelihoods of millions of small scale farmers and low wage workers. Almost all natural fibers are produced by agriculture, and the major part is harvested in the developing world. It is convenient to classify natural fiber in two ways; morphologically, according to the part of plant from which they are obtained and practically according to the uses to which they are put, which in turn depend on their properties. From the view point of the uses vegetable fibers may be classified into following groups; textile fibers, cordage fibers, brush and mat fibers, stuffing and upholstery materials, paper making materials etc. Fibers from the view point of the part are classified as hair fibers, leaf fibers, woody fibers, bast fibers, etc. The use of fibers for paper making differs completely from their use in textiles, in that in papermaking it is ultimate fiber cells which are used; thus in papermaking process consists in breaking down the strands of fiber into the ultimate fibers. Jute, the most important textile fiber apart from cotton, is obtained from two species of corchorus(white jute) and *C.olitorius*L. (tossa jute). Farmers around the world produce a wide variety of natural fibres, planting crops and rearing animals. Plant fibres may be from the plant fruit (e.g. cotton), stems (e.g. flax and jute) or leaf (e.g.sisal). Natural fibres are generally considered more environment friendly than synthetics in their production and disposal. However, there is great variation depending on the fibre and the growing conditions. Many chemicals are used to contain pests and weeds. Chemicals are also used in the processing and dyeing which can lead to water contamination. Processing of some natural fibers can lead to high levels of water pollutants, but they consist mostly of biodegradable compounds, in contrast to the persistent chemicals, including heavy metals, released in the effluent from synthetic fiber processing. Farming and production of natural fibres also plays a significant role in eradicating poverty as an important source of farming income and contribution to food security in developing countries. Demand for natural fiber composites are largely driven by increasing environmental awareness. Due to low cost, low density, acceptable specific properties, ease of separation, enhanced energy recovery, CO<sub>2</sub> neutrality, biodegradability and recyclable properties, natural fiber use in composites is



gaining as demand grows for component materials that are durable, reliable, light weight, with mechanical properties better than those of traditional materials. Total global natural fiber composite market expected to grow at 11% CAGR. Some of the fundamentals of the book are the occurrence and nature of vegetable fibres, conditions necessary for growing flax, mulberry family (moraceae), lime family (titliaceae), experiments on mechanized production of jute, mallow family (malvaceae), kenaf production in various other countries, the use of unretted kenaf ribbons for sack manufacture, pea family (leguminosae), sterculia family (sterculiaceae), agave family (agavaceae), structure of the sisal industry, narcissus family (amaryllidaceae), lily family (liliaceae), pineapple family (bromeliaceae), fibres from other species of musa and a related genus, brush making fibres, etc. The book contains process and other parameters for the manufacturing of fibers arrive from natural sources. Due to eco friendly nature there is very good domestic and export potentiality for natural fiber. This is very useful book for new generation entrepreneurs, consultant institutional libraries, and existing units.

# [The Complete book on Natural Dyes & Pigments](#)

**Author:** NIIR Board of Consultants & Engineers

**Format:** Paperback

**Book Code:** NI160

**Pages:** 448

**ISBN:** 8178330326

**Price: Rs. 1,100.00 US\$ 125.00**

Natural dyes are dyes or colorants derived from plants, invertebrates, or minerals. The majority of natural dyes are vegetable dyes from plant sources. Dyeing is the process of imparting colors to a textile material. Different classes of dyes are used for different types of fiber and at different stages of the textile production process, from loose fibers through yarn and cloth to completed garments. There are technologies that manufacture the pigments for plastics, rubber and cosmetics. Therefore; dyes and pigments have a vast area of applications and have a huge demand in industry. Contrary to popular opinion, natural dyes are often neither safer nor more ecologically sound than synthetic dyes. They are less permanent, more difficult to apply, wash out more easily, and often involve the use of highly toxic mordant. Of course, the colour possibilities are far more limited; the color of any natural dye may be easily copied by mixing synthetic dyes, but many other colors are not easily obtained with natural dyes. However, some mordant are not very toxic, and the idea of natural dyestuffs is aesthetically pleasing. Applying natural dyes in your fabric production using enzymes will reduce your production cost and improve control. There are various kind of natural dyes; quinonoid dyes, cyanine dyes, azo dyes, biflavyonyl dyes, omochromes, anthraquinone, coprosma gesus etc. The use of natural dyes in cloth making can be seen as a necessary luxury to trigger off a change in habits. Dyes which stand out for their beauty and ecological attributes would never be employed on just any material but on noble fabrics such as wool, silk, linen or cotton, made to last more than one season. Market value will benefit from consumer preferences for environmentally friendly products, which will support consumption of high performance dyes and organic pigments. This book basically deals with the use of carotenoids as food colours , bianthraquinones and related compounds, intermediate degradation products of biflavonyls, dyestuffs containing nuclear sulphonic and carboxylic acid groups, quinonoid dyes, cyanine dyes, optical whitening agents, natural dyes for food, stability of natural colourants in foods effect of additives, pyrimidine pigments, the total synthesis of the polyene pigments, red pigment from geniposidic acid and amino compound, effect of acid and amine on the formation of red pigment from geniposidic acid, effect of the substituted position of amino group and chain length of amino compound

etc. Due to pollution problems in synthetic dyes and pigments industry, the whole world is shifting towards the manufacturing of natural dyes and pigments. The present book contains techniques of producing different natural dyes and 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 book very useful.

**The Complete Book on Biodegradable Plastics and Polymers  
(Recent Developments, Properties, Analysis, Materials &  
Processes)**

**Author:** NIIR board

**Format:** Paperback

**Book Code:** NI165

**Pages:** 672

**ISBN:** 8178330350

**Price:** Rs. 1,275.00 **US\$** 125.00

Biodegradable plastics made with plant based materials have been available for many years. The term biodegradable means that a substance is able to be broken down into simpler substances by the activities of living organisms, and therefore is unlikely to persist in the environment. There are many different standards used to measure biodegradability, with each country having its own. The requirements range from 90 per cent to 60 per cent decomposition of the product within 60 to 180 days of being placed in a standard composting environment. They may be composed of either bio plastics, which are plastics whose components are derived from renewable raw materials, or petroleum based plastics which contain additives. Biodegradability of plastics is dependent on the chemical structure of the material and on constitution of the final product, not just on the raw materials used for its production. Polyesters play a predominant role as biodegradable plastics due to their potentially hydrolysable ester bonds. Bio based polymers are divided into three categories based on their origin and production; polymer directly extracted from biomass, polymers produced by classical chemical synthesis using renewable biomass monomer and polymers produced by microorganisms or genetically modified bacteria. In response to public concern about the effects of plastics on the environment and in particular the damaging effects of sea litter on animals and birds, legislation is being enacted or is pending in many countries to ban non degradable packing, finishing nets etc. This book basically deals with biodegradable plastics developments and environmental impacts, hydro biodegradable and photo biodegradable, starch synthetic aliphatic polyester blends, difference between standards for biodegradation, polybutylene succinate (pbs) and polybutylene, recent developments in the biopolymer industry, recent advances in synthesis of biopolymers by traditional methodologies, polymers, environmentally degradable synthetic biodegradable polymers as medical devices, polymers produced from classical chemical synthesis from bio based monomers, potential bio based packaging materials, conventional packaging materials, environmental impact of bio based materials: biodegradability and compostability, etc. Environmentally acceptable degradable polymers have been defined as polymers that

degrade in the environment by several mechanisms and culminate in complete biodegradation so that no residue remains in the environment. The present book gives thorough information to biodegradable plastic and polymers. This is an excellent book for scientists engineers, students and industrial researchers in the field of bio based materials.

# Handbook on Natural Dyes for Industrial Applications (Extraction of Dyestuff from Flowers, Leaves, Vegetables) 2nd Revised Edition

**Author:** Dr. Padma S Vankar

**Format:** Paperback

**Book Code:** NI195

**Pages:** 432

**ISBN:** 9789381039755

**Price:** Rs. 1,575.00 US\$ 150.00

Dyeing is the process of imparting colors to a textile material. Natural dyes are friendly and satisfying to use. They are obtained from sources like flowers, leaves, insects, bark roots etc. however, they are not readily available and involve an extraction process. With the advancement of chemical industry, all finishing procedures of textile materials have been growing constantly and, sustainable and ecological production techniques have become extremely crucial. This is a single book which has information related to extraction of dyestuff from 19 common flowers, weeds, bark or leaves and its application on cotton silk and wool fabrics for textile industry. The Handbook describes the step wise methodology of extraction, mordanting, dyeing with photos of the actual plants part used for extraction of Natural dye. Shade cards have been incorporated so that the full gamut of colors can be visualized from each dyestuff. Major contents of the book are nature of material to be dyed, history of natural dyes, promotion of natural dyes, sources of natural dyes, mordanting the textiles for natural dyeing, quality standards for vegetable dyes, methods of dye extraction, dyeing methodology, chemistry of dye, some recent publications on natural dyes. This handbook is designed for use by everyone engaged in the natural dye manufacturing and explains different methods of dye extraction. Also contains addresses of machinery suppliers with their photographs. It will be a standard reference book for professionals, entrepreneurs, those studying and researching in this important area. About Author The Author Dr. Padma S Vankar, works as Principal Research Scientist, in Facility for Ecological and Analytical Testing (FEAT) at Indian Institute of Technology, Kanpur. She has been engaged in the screening and characterization of newer natural dyes for the past 10 years. She also works in the area of designing synthetic strategies for Eco-friendly dyes using microwave heating system. Using innovative technology for natural dyeing has been her main emphasis. The author has conducted several workshops throughout India in order to popularize natural dyeing.



# [The Complete Book on Water Soluble Gums and Resins](#)

**Author:** H. Panda

**Format:** Paperback

**Book Code:** NI240

**Pages:** 640

**ISBN:** 9788178331478

**Price:** Rs. 1,675.00 **US\$** 150.00

Resins, gums and latex are almost ubiquitous in the plant kingdom and many of them continue to play an important role in our daily lives. Numerous plants produce some kind of resin, latex or gum, but only a few are commercially important today, even though their uses and applications are truly manifold. They have been used as adhesives, emulsifiers, thickening agents, they are added to varnishes, paints and ink; they lend their aromas to perfumes and cosmetics and even play a role in pharmacy and medicine. Gums are viscous substances which are secreted by the bark of certain trees. Usually transparent (but sometimes slightly tinted) they contain a mucilage which when dissolved in water makes the latter become viscous. When this mucilage is dissolved in water it can be made to precipitate with alcohol. Resins, on the other hand, are gluey and viscous substances which may be whitish, brownish, or red and are secreted by certain trees when they are incised. Resins contain an essence and are usually not water soluble. Most commonly found types of plant exudates are chemically completely different to gums. Several acacia species are important economically. True gums are complex organic substances mostly obtained from plants, some of which are soluble in water and others of which, although insoluble in water, swell up by absorbing large quantities of it. They are used in adhesives, pharmaceuticals, inks, confections, and other products. Resins are terpene based compounds. Terpenes constitute one of the largest groups of plant chemicals and they can be very complex. They are not water soluble, but can be either oil soluble or spirit soluble, depending on their specific chemical composition. Worldwide interest and activity in gums and resins has grown dramatically in the last few years. Governments, environmentalists, research institutions and other interest groups are among those who have begun to push for stronger support for gums and resins as a way to meet a range of economic, social and environmental goals. Some of the fundamentals of the book are photosynthesis and metabolism of carbohydrates, occurrence, properties and synthesis of the monosaccharides, nitrogen derivatives, carbohydrates in parenteral nutrition, essential carbohydrates, ethers, anhydro sugars and unsaturated derivatives, constitution of nicotinic acid and of nicotinamide, industrial methods of preparing nicotinic acid and nicotinamide, general physiology, metabolism and

mechanism of the vitamin action etc. This book gives a complete insight of water soluble gums and resins that are used in day to day life in various Industries. It is an invaluable resource to all its readers, students, scientist, new entrepreneurs, existing industries and others.

# [The Complete Book on Jute & Coir Products \(with Cultivation & Processing\)](#)

**Author:** NPCS Board of Consultants & Engineers

**Format:** Paperback

**Book Code:** NI287

**Pages:** 328

**ISBN:** 9789381039625

**Price:** Rs. 1,175.00 US\$ 125.00

Jute & Coir are one of the important fibre crops in India. India is the largest producer of Jute & Coir, contributing more than 60% of the total world production. Besides being the cheapest and the most important material of all textile fibers, Jute & Coir products are bio-degradable eco-friendly with numerous environmental advantages. The Demand of Jute and Coir Products are increasing rapidly because of their environment friendly nature. Jute is one of the most affordable natural fibers and is second only to cotton in amount produced and variety of uses of vegetable fibers. Jute fibers are composed primarily of the plant materials cellulose and lignin. Jute is the name of the plant or fiber that is used to make burlap, hessian or gunny cloth. Coir is a versatile natural fibre extracted from mesocarp tissue, or husk of the coconut fruit. Generally fibre is of golden color when cleaned after removing from coconut husk; and hence named as "The Golden Fibre". This Book aims at providing a thorough understanding and analysis of the Jute & Coir sector. The book discusses the overview of the Jute & Coir along with their Classification, Structure, Properties and Manufacturing Process of different products. Few major contents of the Book are Jute Cultivation, Coconut Cultivation, Jute Yarn, Sutli & Hessian Cloth, Jute Twine (Jute Rope), Gunny Bags, Jute Garments, Jute Shopping Bags, Gunny Bags (Jute Bags) Manufacturing, Handmade Paper from Jute, Environment Pollution and Effluent Treatment of Jute, Coir Fibre, Coir Pith, Biomass Charcoal Briquetting from Jute and Coir Waste, Rubberized Coir Mattresses, Coir Pith for Absorption and Recovery of Oil from Contaminated Sites, Application of Coir in Agricultural Textiles, Manufacture of Coir Corrugated Roofing Sheet, Coir Machinery Manufacturers, Importers of Coir Products. It also contains the Product and Machinery photographs, Name of Indian Buying Agents of Coir Products with their contact details. The purpose of this book is to provide information to new Entrepreneurs, Technocrats, Students and Professionals.

# [The Complete Book on Biomass Based Products \(Biochemicals, Biofuels, Activated Carbon\)](#)

**Author:** NPCS Board of Consultants & Engineers

**Format:** Hardcover

**Book Code:** NI289

**Pages:** 417

**ISBN:** 9788178331584

**Price: Rs. 1,575.00 US\$ 150.00**

Biomass use is growing globally. Biomass is biological material derived from living, or recently living organisms. It most often refers to plants or plant-based materials which are specifically called lignocellulosic biomass. Biomass (organic matter that can be converted into energy) may include food crops, crops for energy, crop residues, wood waste and byproducts, and animal manure. It is one of the most plentiful and well-utilized sources of renewable energy in the world. Broadly speaking, it is organic material produced by the photosynthesis of light. The chemical materials (organic compounds of carbons) are stored and can then be used to generate energy. The most common biomass used for energy is wood from trees. Wood has been used by humans for producing energy for heating and cooking for a very long time. As an energy source, biomass can either be used directly via combustion to produce heat, or indirectly after converting it to various forms of biofuel. Conversion of biomass to biofuel can be achieved by different methods which are broadly classified into: thermal, chemical, and biochemical methods. Biomass gasification is the conversion of solid fuels like wood and agricultural residues into a combustible gas mixture. The gasification system basically consists of a gasifier unit, a purification system and energy converters- burner or engine. This book offers comprehensive coverage of the design and analysis of biomass gasification, the key technology enabling the production of biofuels from all viable sources like sugar beet and sweet sorghum. It aims at creating an understanding of the nature of biomass resources for energy and fuels, the variety of processes that are available for conversion of the wastes into energy or fuels. The book discusses the overview of the Biomass Energy along with their Properties, Composition, Benefits, Characteristics and Manufacturing Process of Biomass based products. Also it contains suppliers contact details of plant & machinery with their photographs. The content includes biomass renewable energy, prospective renewable resources for bio-based processes, biochemical from biomass, biomass based chemicals, biofuel production from biomass crops, biomass gasification, reuse of bio-genic iron oxides and woody biomass fly ash in cement based materials and agricultural areas, biofuel briquettes from biomass, biomass based activated carbon, environmental aspects. It will be a standard reference book for Professionals,

Decision-makers, Engineers, those studying and researching in this important area and others interested in the field of biomass based products. Professionals in academia and industry will appreciate this comprehensive and practical reference book, due to its multidisciplinary nature.

# About NIIR

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