AN ISO 9001 : 2015 CERTIFIED COMPANY

Natural Fibers Handbook with Cultivation & Uses

AN ISO 9001 : 2015 CERTIFIED COMPANY

Author: NIIR Board of Consultants & Engineers
Format: paperback
Code: NI154
Pages: 560
Price: Rs 1275 | US$ 125
Publisher: NIIR PROJECT CONSULTANCY SERVICES
Shipping: 5 days

About the Book

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.olitoriusL. (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, CO2 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.

Contents

1. INTRODUCTION
The Occurrence and Nature of Vegetable Fibres
Bast Fibres
Leaf Fibres
Fibre Identification
Testing of Fibres
Chemical Analysis
Fibre Fineness and Commercial Use

2. FLAX FAMILY (LINACEAE)
Flax (Linum Usitatissimum)
Conditions Necessary for Growing Flax
Varieties
Cultivation
Harvesting
Pulling
Drying
Retting
Dew Retting
Water Retting
Warm Water Retting
Leaching
Double Retting
Aerated Retting
Green Flax
Scutching
Flax in the U.S.S.R
Flax in Belgium
Flax in Other Countries
China
Japan
Egypt
India
Australia
New Zealand
Kenya
Uganda
Grading of Flax
Properties of Flax
Trade

3. MULBERRY FAMILY (MORACEAE)
Hemp (Cannabis Sativa)
Botany
Breeding Experiments
Cultivation

Harvesting
Yield
Retting
Breaking and Scutching
Hemp in China
Hemp in Chile
Quality of Hemp
Properties and Uses of Hemp

4. LIME FAMILY (TITLIACEAE)
Jute (Corchorus Capsularis and C. Olitorius)
Cultivation
Soil
Preparation of the Soil
Sowing
Varieties
Harvesting
Retting
Extraction of Fibre
Cost of Production
Jute in Brazil
Jute in China
Production in Taiwan
Experiments on Mechanized Production of Jute
Varieties
Cultivation
Harvesting
Ribboning
Scutching
Retting
Washing
Drying and Storage
Sorting and Grading
Production of Jute in Other Countries
Burma
U.S.S.R
Borneo
Malaya
Philippines
Thailand
Nepal
Vietnam

Iran
Peru
Miscellaneous Countries
Sorting and Grading of Jute
Uses of Jute
The Jute Trade
Triumfetta Species
Honckeny Ficifolia

Funga Fibre (Cephalonema Polyandrum)

5. MALLOW FAMILY (MALVACEAE)
Knaf (Hibicus Cannabinus)
Varieties
Sowing
Harvesting
Growth Phases
Retting
Pests and Diseases
Kenaf in India
Kenaf Production in Various Other Countries
Argentina
China
Egypt
Guatemala
Haiti
Italy
Mexico
Mozamibque
North Africa
Papua and New Guinea
Peru
Southern Rhodesia
Spain
Thailand
South Africa
Economics of Kenaf
The Use of Unretted Kenaf Ribbons for Sack Manufacture
Properties of Kenaf
Roselle (Hibiscus Sabdariffa)
Fibres From Other Species of Hibiscus
Urena Lobata
Cultivation
Retting
Yields
Distribution
Labour Requirements in Fibre Preparation
Grading of the Fibre
Properties and Uses
Trade
Abutilon Species
Sida Species
Pavonia Species
Thespesia Species
Miscellaneous Fibre Plants of the Malvaceae

6. NETTLE FAMILY (URTICACEAE)
Ramie (Boehmeria Nivea and its Var. Tenacissima)
Varieties
Soils and Growing Conditions

Planting
Harvesting
Yields
Replanting
Fibre Extraction
Degumming
Problems of Ramie Degumming
Drying
Ramie in China
Varieties in China
The Ramie Industry in Japan
Varieties Grown
Pests and Diseases
Grading of Ramie in Japan
Spinning of the Fibre
Ramie in Taiwan
Ramie in Brazil
Ramie in Other Countries
Uses of Ramie Fibre
Properties of Ramie
The Trade in Ramie
Other Fibre Yielding Plants of the Urticaceae

7. PEA FAMILY (LEGUMINOSAE)
Sunn or Sunn Hemp (Crotalaria Juncea)
Varieties in India
Growing Conditions
Harvesting and Yield
Retting
Washing and Stripping
Preparation of Hanks
Cleaning and Dressing
Grading
Cost of Production
Sunn Hemp in Ceylon
Properties and Uses of Sunn Hemp
Trade and Prices
Spanish Broom (Spartium Junceum)
Sesbanea Aculeata

8. STERCULIA FAMILY (STERCULIACEAE)
Abroma Augusta
Cultivation
Harvesting
Yields
Fibre Extraction
Properties of the Leaf

9. THE MECHANIZED PRODUCTION OF STEM FIBRES
Large Labour Requirements of Non Mechanized Production
Advantages of Mechanized Production

Harvesting Mechanically
Ribboning Machines
Problems of Ribboning
Drying
Retting
Washing
Costs of Mechanized Production

10. AGAVE FAMILY (AGAVACEAE)
Agave Species
Botany
Fibre Yields of Various Species
Breeding Experiments With Agave Species
Nature of the Fibres in the Agave Leaf
Sisal (Agave Sislana)
Cultivation
Climate and Soil
Preparation of the Land
Planting
Fertilizers
Harvesting
Yields
Decortication and Decorticating Machines
Flume Tow
Structure of the Sisal Industry
Drying
Artificial Drying
Brushing
Grading
Baling
Labour Requirements for Sisal Production
Production in Other Countries
Properties of Sisal
Uses of Sisal
Trade
Henequen (Agave fourcroydes)
Cultivation
Harvesting
Decortication
Drying
Uses
Trade
Cantala (Agave Cantala)
Cultivation
Harvesting
Retting
Uses
Trade
Agave Letonae
Fibres from other Agave species

11. NARCISSUS FAMILY (AMARYLLIDACEAE)
Furcrea Species
Mauritius Hemp (Furcrea Gigantea Var. Willemettiana)
Yields
Extraction of the Fibre
Retting
Uses of the Fibre in Mauritius
Properties of the Fibre
Furcraea Gigantea
Furcraea Cabuya
Furcraea Macrophylla
Furcraea Andina
Furcraea Humboldtiana
Furcraea Cubensis
Curculigo Species

12. LILY FAMILY (LILIACEAE)
New Zealand Flax (Phorium Tenax)
Production of Phormium in New Zealand
Varieties
Propagation
Cultivation
Diseases, etc.
Harvesting
Stripping
Washing & Bleaching
Scutching
Baling and Grading
Advantages and Disadvantages of Phormium Production
Production and Costs
Phormium Tenax in Argentina
Phorium Tenax in South Africa
Phorium in Other Countries
Properties of Phorium Fibre
Trade
Sansevieria Species
Propagation and Cultivation
Lily Family (Liliaceae)
Extraction of the fibre
Production in Mexico
Other Countries
Yield
Properties
Yucca And Some Relatives

13. PINEAPPLE FAMILY (BROMELIACEAE)
Pineapple Fibre (Ananas Comosus)
Cultivation
Production in the Philippines
Production in Other Countries
Extraction by Machine

Pita Fibre or Silk Grass (Aechmea magdalenae)
Harvesting
Yield
Caroa Fibre (Neoglazovia variegata)
Fibre From Other Members of the Bromeliaceae

14. BANANA FAMILY (MUSACEAE)
Abaca or Manila Hemp (Musa Textilis)
Varieties
Cultivation
Propagation
Diseases and Pests
Harvesting
Extraction of the Fibre
Grading of the Fibre in the Philippines
Production of Abaca in Central America
Cost of Producing Abaca
Production in Borneo
Abaca in Malaya
Canton And Pacol Fibres
Properties of Abaca
Uses
Trade
Fibres From Other Species of Musa and a Related Genus

15. PALM FAMILY (PALMAE)
Coir or Coconut Fibre (Cocos nucifera)
Collection of Fruit
Removal of Husks
Retting
Production of Coir Yarn
Grading of Yarn
Costs of Production
Cost of production of Fibre and Yarn
Mattings
Bristle or Coco Fibre
Dyeing of Coir Fibre
Mattress Fibre and Combings
Production of Coir Fibre in India
Production in the Philippines
Machine Extraction of Coir Fibre
Properties of Coir
Trade
Crin Vegetal (Chamaerops humilis)
Botany
Distribution
The Industry in Morocco
Extraction of the Fibre
Uses of the Fibre
Technical Characteristics
Trade

Tucum Fibre (Bactris Setosa)
Date Palm Fibre (Phoenix Dactylifera)
Doum Fibre (Hyphaene Thebaica)

16. BOMBAX FAMILY (BOMBACACEAE)
Kapok (Ceiba Pentandra)
Soils
Propagation
Yields
Harvesting
Hulling
Drying
Removal of Seeds
Baling
Kapok in India
Collection of the Floss
Preparation
Grading
Baling
Properties of Kapok Fibre
Uses of Kapok

17. MILKWEED FAMILY (ASCLEPIADACEAE)
Akund Floss (Calotropis Procera and C. Gigantea)
Yields
Preparation
Grading and Packing
Trade
Uses
Kendyr Fibre (Apocynum Venetum)
Asclepias Species

18. BRUSH MAKING FIBRES
Fibres Used in Earlier Times
Properties required in Brush Making Fibres
Bahia Piassava (Attalea funifera)
Botany and Germination
Collection and Preparation of the Fibre
Properties and Uses
Para Piassava (Leopoldinia Piassaba)
West African Piassava (Raphia Hookeri and R. Graolis)
Madagascar Piassava (Vonitra Fibrosa)
Mexican fibre (Agave lecheguilla)
Harvesting and Extraction of the Fibre
Cleaning and Grading
Uses
Jaumave Fibre (Agave Funkiana)
Coco Fibre (Cocos Nucifera)
Palmyra or Bassine Fibre (Borassus Flabellifer)
Kitool Fibre (Caryota Urens)
Gomuti Fibre (Arenga Saccharifera)

Broom Root (Muhlenbergia Macroura)
Italian Whisk (Sorghum Vulgare)
Palmetto Fibre (Sabal Palmetto)

19. PAPER MAKING FIBRES
Properties for Paper Making
Treatment for Conversion into Pulp
Wood
Esparto Grass
Collection from Wild Plants in North Africa
Production in Spain
Treatment and Uses
Straw
Bamboo
Bagasse
Other Materials

20. MISCELLANEOUS FIBRES
Toquilla (Carludovica Palmata)
Preparation For Making Panama Hats
Weaving and Bleaching
Alpinia Chinensis
Polygala Gomesiana And Other Sources or Rope, etc.

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Market Research, Manufacturing Process, Machinery, Raw Materials, Project Feasibility, Investment Opportunities, Technical Consultancy and Startup Help.

NPCS also publishes process technology books, technical books, startup books, directory, business database, detailed project reports and market research reports.

Our Detailed Project Report aims at providing all the critical data required by entrepreneurs for starting new business ventures.

NIIR PROJECT CONSULTANCY SERVICES
106-E, Kamla Nagar, New Delhi-110007, India

Email: npcs.india@gmail.com **Website:** https://www.niir.org/