Cashew Business

A Profitable Return on Investment

(Cashew Plantation, Production & Processing and its By-Products, Cashew Nut Shell Liquid (CNSL), Cashew Nut, Cashew Kernels)
Introduction

The cashew tree (Anacardium occidentale) is a tropical evergreen tree that produces the cashew seed and the cashew apple. The cashew seed, often simply called a cashew, is widely consumed. It is eaten on its own, used in recipes, or processed into cashew cheese or cashew butter. The cashew apple is a light reddish to yellow fruit, whose pulp can be processed into a sweet, astringent fruit drink or distilled into liquor.
The shell of the cashew nut yields derivatives that can be used in many applications from lubricants to paints, and other parts of the tree have traditionally been used for snake-bites and other folk remedies. Health Benefits of the Cashew Nut: Prevents Cancer, Healthy Heart, Lowers High Blood Pressure, Healthy Bones, helps in Weight Loss Anti-oxidants etc.

Cashew shell oil extracted from the shells is caustic and causes burns on the skin. The mucous membranes of the mouth and throat are severely affected when it comes into contact with shell oil or the irritating fumes emitted during roasting. The oily shell liquid has many uses.
Climatic requirements

- Cashew trees are genuinely tropical and very frost sensitive.

- The trees grow in a wide spectrum of climatic regions between the 25 °N and S latitudes.

- Although the cashew can withstand high temperatures, a monthly mean of 25 °C is regarded as optimal.

- Yearly rainfall of 1 000 mm is sufficient for production but 1 500 to 2 000 mm can be regarded as optimal.
• The cashew tree has a well-developed root system and can tolerate drought conditions. Rain during the flowering season causes flower abortion due to anthracnose and mildew.

• During harvesting, while nuts are on the ground, rain and overcast weather causes the nuts to rot or start germinating.

• Nuts germinate within 4 days when lying on wet soil.
Now a day’s horticultural commodities getting export from India, among them cashew retain top position. For cashew cultivation certain parameters such as characteristics of cashew, weather condition, geographical location, propagation - layering, budding and grafting, nature of soil are the main to improve and increase the overall productivity of cashew with suitable planning of efficient water management. This book includes organic farming method of cashew. Three main cashew products are traded on the international market - raw nuts, cashew kernels and cashew nut shell liquid (CNSL). A fourth product - the cashew apple is generally processed and consumed locally.
Cashew nut shell liquid is a by-product of the cashew industry. The nut has a shell of about 1/8 inch thickness inside which is a soft honeycomb structure containing a dark reddish brown viscous liquid. It is called the cashew nut shell liquid, which is the pericarp fluid of the cashew nut.

CNSL has innumerable applications, such as friction linings, paints, laminating resins, rubber compounding resins, cashew cements, polyurethane based polymers, surfactants, epoxy resins, foundry chemicals, and intermediates for chemical industry. It offers much scope and varied opportunities for the development of other tailor-made polymers.
India has the largest area under cashew and is confined mainly to the peninsular areas. It is grown in Kerala, Karnataka, Goa and Maharashtra along the west coast and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the east coast. The highest productivity is observed in Kerala and Maharashtra with over one ton per ha. India is also one of the largest cashew consuming countries in the world.

Cashew is exported from India in several forms, such as cashew kernels, broken and whole; raw cashew nuts; roasted cashew nuts and cashew nut shell liquid.
The export of cashew kernels from India has grown at the rate of 3.6 per cent per annum during the last ten years as compared to the annual growth rate of 4.73 per cent of the world export. Consumption of cashew in the world continues to rise and is expected to continue with positive health reports and beneficial diets.

The demand for cashew nut is increasing rapidly. India is leading producer, processor, consumer and exporter of cashew nuts in the world. It is one of the important agricultural commodities exported from India to many countries in the world. About two third of cashew produced in the country is consumed locally. India accounts for 65 percent of total cashew nut exports in the world and export cashew to more than 60 countries.
This book is not only confined to the different methods of cashew processing but also describe about by-products obtained from cashew. The traditional method of cashew processing through which we get CNSL (Cashew Nut Shell Liquid), the major source of Cardanol. We also came to know about production of CNSL derivatives, polymerization of CNSL, rubber like elasticity products, styrene product of CNSL, multifunctional alcohol obtained from CNSL and lots of other information.
Cardanol is a phenolic lipid which is the byproduct of cashew nut processing. It has several uses and applications in chemistry, chemical industries, additives industries and fuel industries for low sulphur diesel fuel. This book contains the purification process of CNSL for isolation of cardanol, evaluation of copperised CNSL and neem oil as wood preservatives. It also provides a wide idea to their readers about its nutritional value, commercial exploitation, hygiene and safety issues, packaging and preservation, uses, manufacturers and suppliers of machinery of this process.
This book also engaged in quality control system, design and development of soft nano materials from CNSL cashew to play a vital role in nano technology. It covers all the area concerned in this field and presents a crystal clear overview on the process and its by-product from all possible aspects.
# Table of Contents

1. Introduction

2. Indian cashew - The Government initiatives

3. Cashew Development in India

4. Agro-ecological regions and classification of cashew

5. Morphology and Characteristics of growth and development of cashew tree

6. Improved productivity of cashew through soil and nutrient management
7. Effect of weather parameters of cashew production

8. Improvement: Breeding, Germplasm, Selection and hybridization

9. Diseases of Cashew

10. Propagation- layring, budding and Grafting

11. Cultivation

12. Planning for improved productivity through efficient water management
13. Organic farming in cashew

14. Traditional Method of Cashew Processing

15. Cashew Processing Operation

16. Production of CNSL Derivatives
   Rubber like elasticity products
   Electrical insulating materials
   Phenol of CNSL and its products
   Cating Composition from CNSL
   Polymerization of CNSL
   Polymerized ethers of CNSL
   CNSL-Shellac derivatives
   Cellulose ethers plasticized with ethers of CNSL
   Modified ether-esters of CNSL
Polymerized Cardanol
Furfuraldehyde condensation product of CNSL
Styrene product of CNSL
Glyceryl ethers of Hydrogenated cardanol
Anacardic-acrolein resins
Allyl ethers of anacardic products
Pine wood-Anacardic products
Products of anacardic materials using sulfonic acid catalysts
Molding compound of Cashew Nut Shell Oil polymer
Epoxy modified CNSL
Anacardic acid treated with TRIS (Hydroxyethyl Isocyanurate)
Rust inhibitor from CNSL
Project Report of Anti-Corrosive Point from CNSL
Eco-friendly management of water hyacinth with a mycoherbicide with CNSL
Multifunctional alcohol obtained from CNSL
Design and Development of soft nano materials from CNSL
Cashew to play role in nano technology
17. Quality control of cashew kernels

18. Commercial exploitation of cashew apples
- Infestation
- Hygiene and Safety
- Food hygiene and law
- Food poisoning and its causes
- Personal hygiene
- Cleanliness of equipment and working area
- Other sources of contamination
- Packaging and Preservation
- Uses of cashew

References
List of cashew manufacturers/Suppliers of Machinery
Cashew Research Organisations
Cashew Regional Nurseries in Public Sector areas
Cashew Regional Nurseries in Private Sector Areas
Major processors and exporters of cashew
Internet sites

19. CASHEW LIQUID: Development of a Cashew Nut Cracking Device

20. The Potential of CNSL in Fuel Blends for Engines

21. Process of Purification of Cashew Nut Shell Liquid(CNSL) for Isolation of Cardanol

22. Evaluation of Copperised Cashew Nut Shell Liquid and Neem Oil as Wood Preservatives

23. Utilisation of Cashew Nut Shell Liquid from Anacardium occidentale as Starting Material for Organic Synthesis
24. Edge Retentive and Solvent Free Coating Based on a Renewable Raw Material

25. Multifunctional additives from cashew nut shell liquid

26. Honey coated nuts

27. Volatile nut aroma and flavour compositions

28. Gloss coatings to foods and for protecting nuts from rancidity

29. Lubricity Improving Additive Composition for Low Sulfur Diesel Fuel
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30.</td>
<td>Process for preparation of oximes</td>
</tr>
<tr>
<td>31.</td>
<td>Antioxidant composition for motor gasoline</td>
</tr>
<tr>
<td>32.</td>
<td>Rapid Dry Fiberglass Stain</td>
</tr>
<tr>
<td>33.</td>
<td>Method for producing cardanol (II)</td>
</tr>
<tr>
<td>34.</td>
<td>Manufacture of Bisphenol Compounds</td>
</tr>
<tr>
<td>35.</td>
<td>Preparation of Hydrophobically Modified Poly(acrylic acid) [PAA]</td>
</tr>
<tr>
<td>36.</td>
<td>Heat-curable epoxy resin composition</td>
</tr>
</tbody>
</table>
37. Adhesives for car body assembly
38. Nutritional supplement compositions
39. Hydrophobic Polyols of Low Viscosity
40. Preparation of Flavour or Fragrance Microcapsules
41. Silane-Modified Phenolic Resins
Niir Project Consultancy Services (NPCS) can provide Process Technology Book on Cashew (Cultivation, Processing & By-Products)

See more
https://goo.gl/nm35vc
https://goo.gl/V7cbRB
https://goo.gl/SIhj3c
Visit us at

www.entrepreneurindia.co
Take a look at NIIR PROJECT CONSULTANCY SERVICES on #StreetView

https://goo.gl/VstWkd
Locate us on Google Maps

https://goo.gl/maps/BKkUtq9gevT2
Contact us
Niir Project Consultancy Services
106-E, Kamla Nagar, Opp. Spark Mall,
New Delhi-110007, India.
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Tel: +91-11-23843955, 23845654, 23845886, 8800733955
Mobile: +91-9811043595
Fax: +91-11-23841561
Website: www.entrepreneurindia.co, www.niir.org
Take a look at NIIR PROJECT CONSULTANCY SERVICES on
#StreetView
https://goo.gl/VstWkd
Who are we?

- One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services

- We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients’ in India & abroad

www.entrepreneurindia.co
We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.
We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.
What do we offer?

- Project Identification
- Detailed Project Reports/Pre-feasibility Reports
- Business Plan
- Industry Trends
- Market Research Reports
- Technology Books and Directory
- Databases on CD-ROM
- Laboratory Testing Services
- Turnkey Project Consultancy/Solutions
- Entrepreneur India (An Industrial Monthly Journal)
How are we different?

- We have two decades long experience in project consultancy and market research field
- We empower our customers with the prerequisite know-how to take sound business decisions
- We help catalyze business growth by providing distinctive and profound market analysis
- We serve a wide array of customers, from individual entrepreneurs to Corporations and Foreign Investors
- We use authentic & reliable sources to ensure business precision
Our Approach

1. Requirement collection
2. Thorough analysis of the project
3. Economic feasibility study of the Project
4. Market potential survey/research
5. Report Compilation
Who do we serve?

- Public-sector Companies
- Corporates
- Government Undertakings
- Individual Entrepreneurs
- NRI’s
- Foreign Investors
- Non-profit Organizations, NBFC’s
- Educational Institutions
- Embassies & Consulates
- Consultancies
- Industry / trade associations
Sectors We Cover

- Ayurvedic And Herbal Medicines, Herbal Cosmetics
- Alcoholic And Non Alcoholic Beverages, Drinks
- Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin
- Activated Carbon & Activated Charcoal
- Aluminium And Aluminium Extrusion Profiles & Sections,
- Bio-fertilizers And Biotechnology
- Breakfast Snacks And Cereal Food
- Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling
Sectors We Cover

- Bamboo And Cane Based Projects
- Building Materials And Construction Projects
- Biodegradable & Bioplastic Based Projects
- Chemicals (Organic And Inorganic)
- Confectionery, Bakery/Baking And Other Food
- Cereal Processing
- Coconut And Coconut Based Products
- Cold Storage For Fruits & Vegetables
- Coal & Coal Byproduct
Sectors We Cover cont...

- Copper & Copper Based Projects
- Dairy/Milk Processing
- Disinfectants, Pesticides, Insecticides, Mosquito Repellents,
- Electrical, Electronic And Computer based Projects
- Essential Oils, Oils & Fats And Allied
- Engineering Goods
- Fibre Glass & Float Glass
- Fast Moving Consumer Goods
- Food, Bakery, Agro Processing
Sectors We Cover  cont...

- Fruits & Vegetables Processing
- Ferro Alloys Based Projects
- Fertilizers & Biofertilizers
- Ginger & Ginger Based Projects
- Herbs And Medicinal Cultivation And Jatropha (Biofuel)
- Hotel & Hospitality Projects
- Hospital Based Projects
- Herbal Based Projects
- Inks, Stationery And Export Industries
Sectors We Cover

- Infrastructure Projects
- Jute & Jute Based Products
- Leather And Leather Based Projects
- Leisure & Entertainment Based Projects
- Livestock Farming Of Birds & Animals
- Minerals And Minerals
- Maize Processing (Wet Milling) & Maize Based Projects
- Medical Plastics, Disposables Plastic Syringe, Blood Bags
- Organic Farming, Neem Products Etc.
Sectors We Cover

- Paints, Pigments, Varnish & Lacquer
- Paper And Paper Board, Paper Recycling Projects
- Printing Inks
- Packaging Based Projects
- Perfumes, Cosmetics And Flavours
- Power Generation Based Projects & Renewable Energy Based Projects
- Pharmaceuticals And Drugs
- Plantations, Farming And Cultivations
- Plastic Film, Plastic Waste And Plastic Compounds
- Plastic, PVC, PET, HDPE, LDPE Etc.
Sectors We Cover

- Potato And Potato Based Projects
- Printing And Packaging
- Real Estate, Leisure And Hospitality
- Rubber And Rubber Products
- Soaps And Detergents
- Stationary Products
- Spices And Snacks Food
- Steel & Steel Products
- Textile Auxiliary And Chemicals
- Township & Residential Complex
- Textiles And Readymade Garments
- Waste Management & Recycling
- Wood & Wood Products
- Water Industry (Packaged Drinking Water & Mineral Water)
- Wire & Cable
Contact us

Niir Project Consultancy Services
106-E, Kamla Nagar, Opp. Spark Mall,
New Delhi-110007, India.
Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Tel: +91-11-23843955, 23845654, 23845886, 8800733955
Mobile: +91-9811043595
Fax: +91-11-23841561
Website: www.entrepreneurindia.co, www.niir.org
Take a look at NIIR PROJECT CONSULTANCY SERVICES on
#StreetView

https://goo.gl/VstWkd
Follow Us

- https://www.linkedin.com/company/niir-project-consultancy-services
- https://www.facebook.com/NIIR.ORG
- https://www.youtube.com/user/NIIRproject
- https://plus.google.com/+EntrepreneurIndiaNewDelhi
- https://twitter.com/npcs_in
- https://www.pinterest.com/npcsindia/

www.niir.org  www.entrepreneurindia.co
THANK YOU!!!

For more information, visit us at:
www.entrepreneurindia.co