LITERATURE REVIEW

The relevant literature is reviewed on the basis of Books, Periodicals, News Papers and Websites and Research Papers. The detailed review is given below

PALM TREE SEEKING ATTENTION, By: Dr V.r. PalaniVelu, G. ShenbagaVeni, U. Punitha : Palm neera. Palm neera is a nu-tritional drink, which is specially very popular during the flowering season. The neera season begins in January when the palm trees start budding. In this period, juice is obtained only from the male palm trees. The female palm trees start giving sap in the last week of March or the first week of April.

National Chemical Laboratory,(Council of Scientific & Industrial Research) Dr. Homi Bhabha Road, Pune – 411 008, India , Publication and Science Communication Unit, Press release , 14 August 2008. Increased shelf life of Neera : National Chemical Laboratory (NCL), Pune has developed a process for improving the shelf life of Neera, a traditional rural drink derived from the sap of the Palmyra, sago or date palm. These palms account for more than 35% of the 170 million palms in India. More than 70% of these palms are not tapped.

Coconut Neera production and processing in Karnataka, G.M. Siddharameswara Swamy, Senior Technical Officer, CDB RO, Bangalore

What is Neera? Neera, otherwise called SweetToddy is a sap extracted from inflorescence of various species of toddy palms. Neera is a natural and non alcoholic beverage, high in nutritional value and an instant thirst quencher. It is sweet, oyster white, and translucent. It is obtained by slicing the spathes of the palmyra, coconut and sago palms, and scraping the tender most part, just below the crown. It requires neither mechanical crushing, as in the case of cane, nor leaching like that of beet-root. This palm nectar is widely consumed in India, Sri Lanka, Africa, Malaysia, Indonesia, Thailand and Myanmar. This sweet sap of the palm, is fast becoming a popular drink on account of its highly nutritive value, delicious taste and agreeable flavor.

AS KERALA THRIVES ON NEERA, KARNATAKA YET TO WAKE UP, By Deepthi Sanjiv, Bangalore Mirror Bureau | Sep 22, 2015,

The neera extraction technology was developed in Kasargod. A technology developed by a Mangaluru-based research institute has helped revive neera, a nutritious drink made from
coconut inflorescence, in Kerala. Central Plantation Crops Research Institute (CPCRI), Kasargod around a year ago developed a simple ice-box technology called coco-sap-chiller to collect farm fresh and hygienic sap from the coconut tree. Since the collection container was contained in an icebox, the collected remains fresh and unfermented.

ISSN 2249–9687 ,Original Article A Review on palm wine, K. CHANDRASEKHAR, S.SREEVANI, P.SESHAPANI, J.PRAMODHAKUMARI* Dept.of Microbiology, S.V.University, Tirupati, A.P, INDIA, Received 05 February 2012; accepted 19 March 201

Palm wine is the fermented sap of various palm trees especially Palmyra, silverdatepalm and coconut palms Palm wine can be obtained from the young inflorescence either male (or) female ones palm wine is alcoholic beverage that are made by fermenting the sugary sap from various palm plants. It is collected by tapping the top of the trunk by felling the palm tree and boring a hole into the trunk it is a cloudy whitish beverage with a sweet alcoholic taste and very short shelf life of only one day.

Coconut Development Board to market neera as health drink Wednesday 03 September 2014, Author(s): M Suchitra

During a meeting on Tuesday at the Indian Institute of Science, Bengaluru, on the occasion of World Coconut Development Day, the Board highlighted neera as the future of the coconut sector in India. Citing the example of a farmer in Kerala’s Palakkad district, who last year earned Rs 55,000 from 17 coconut trees, T K Jose, chairperson of the board, said that neera would change the very concept of coconut cultivation in the country by providing financial security to the producers.

To allow farmers to tap neera, coconut-growing states will have to amend antiquated excise rules. If kept in its natural form for some time, neera ferments, turns sour and becomes toddy, an alcoholic drink. Excise rules are applicable for toddy. At the moment, Kerala is the only state in the country that has amended the rules to allow tapping and sale of neera

Mathrubhumi.com, Friday, September 4, 2015
Neera can cure liver disease, says study A study has found that Neera, a product manufactured from coconut palms, can be used in the treatment of liver diseases. The study was conducted by the Indian Institute of Science, Bangalore. The study instills hope in both patients with liver disease as well as coconut cultivators. Neera will be mainly beneficial in liver diseases caused by alcohol consumption. The findings has found that liver diseases were completely cured by using Neera. The study team comprised Dr S Sandhya, scientist at the Inorganic and Physical Chemistry department of Indian Institute of Science, Dr M. Ratheesh.

GOLDEN PALM, A POTENTIAL VILLAGE INDUSTRY FOR ECONOMIC UPLIFTMENT OF RURAL POOR. SUNDAY, 11 AUGUST 2013 ADMINISTRATOR

In India palm based activities are about 4000 years old and pursued as an essential traditional village Industry. Traditionally a good number of people depend on these two activities, which are based on existing natural resources, but a major portion of resources lie untapped and unextracted. Also due to factors like lack of awareness, use of traditional methodology without using modern technology, market inaccessibility, the activities based on these resources, which have immense potentiality, have remained dormant.

Kerala launches Neera energy drink, 2March 2014, By Ashraf Padanna/Kochi
The Kerala government has launched Neera, a sweet, non-alcoholic sap tapped from the coconut tree, and its value-added products that are expected to help hundreds of thousands of farmers in the state. Chief Minister Oommen Chandy officially launched the product and distributed tapping licences at a function held in Kottayam yesterday. It is being marketed as an energy drink, rich in sugars, minerals and vitamins, with a low glycemic index of 35. The state hopes to launch the product in the international market as a diabetes-friendly food. It is also claimed to be good for digestion which facilitates clear urination and prevents jaundice. Neera is the raw material for many value-added products such as palm syrup, palm jaggery and palm sugar having high domestic and International demand
MUMBAI: In order to boost ‘Neera’ production in the State, the Maharashtra Government on Tuesday announced that licenses will be issued to farmers and sellers to carry on the dying trade. The announcement was made by State excise and non-conventional energy minister, Ganesh Naik at a meeting held in Mumbai along with Neera farmers from across the State. “Licenses under the Shop and Establishment Act, Food and Drug Administration and trade will be provided by the State to all farmers, distributors and sellers of the drink. It is compulsory to procure the license for this business,” Naik said adding that the trade which has taken a downfall needs to be renewed as it can be a profitable business for many families.

**Sugatha Ghosh, Karnataka CDB’s Chief Coconut Development Officer says.** “Neera has the potential to increase the income of the producers by 10-fold,” According to him, earnings through neera production is very high compared with coconut sales, which can fetch only about Rs 1,200 per year, per tree.

**Production of Neera, Sunil A. Nair*, Mejosh Jose, Regi J. Thomas, R.V. Nair. Central Plantation Crops Research Institute, Regional** Amongst the 2,000 odd palm species in the world, only nine species yield inflorescence sap(neera) / sweet juice and of these only four general species are found in India viz., coconut palm, date palm, palmyrah palm and sago palm. The coconut palm, popularly known as ‘tree of life’, is characteristically a food supplier from its fruit, inflorescence and other edible products. India ranks first in the world in coconut production with a production of 10840 metric tones nuts from 1.89 million hectares; of these Kerala has around 18 crore coconut palms and about 25 % of the palms could be spared for neera tapping.

Product diversification and by product utilisation is one of the thrust areas identified by the Board for promoting coconut industry. The Coconut Development Board has been making several efforts to promote product diversification in coconut so as to reduce dependency on copra & coconut oil market and enable coconut farmers to get more remunerative price for coconut. Promotion of Neera as Nutritious health drink has been identified as an important marketing strategy for ensuring remunerative price to coconut farmers. Neera and its downstream products
like coconut palm sugar, jaggery and syrup are some of the viable products for commercial exploitation to augment income for coconut farmers.

Station, Kayamkulam, Krishnapuram P.O., Kerala State Focus on commercialisation of technologies to capitalize the opportunities for neera. Jayashree. A Senior Technical Officer, CDB, Kochi-1. The vascular sap collected by tapping the immature coconut inflorescence is popularly called Neera. Neera is sweet, oyster white in colour, translucent, high in nutritional value, and susceptible to natural fermentation at ambient temperature within a few hours of extraction. On fermentisation, Neera becomes toddy. Neera is widely consumed in India, Sri Lanka, Africa, Malaysia, Indonesia, Thailand, and Myanmar. It is a delicious and nutritious drink rich in carbohydrates with sources, minerals, vitamins proteins etc and nearby neutral pH. It contains ascorbic acid, nicotinic acid and riboflavin. The drink is popular on account of its high nutritive value, delicious taste and agreeable flavour. Coconut sap is a sweet juice or sap, obtained by tapping the unopened spadix of the coconut.

Lakshadweep realizes the potential of Neera. Sasikumar C, Technical Officer, Coconut Development Board, Kochi The economy of Lakshadweep is mainly dependent on agriculture and fisheries. This part of the country has wealth that is yet to be exploited. The economy here is simple and open with ample scope for development. Lakshadweep agriculture earns the livelihood for more than ninety percent of the population of this Union Territory. Coconut cultivation is a major economic activity of the people of Lakshadweep. Coconut is grown in 2700 ha. in 11 islands and the production is 40 metric tonnes per year. Lakshadweep Ordinary and Lakshadweep Micro are the two common varieties grown and copra and coconut oil are the traditional coconut products made. Tender coconut harvesting is also picking up now. Tapping of neera is another activity undertaken in the island since time immemorial.

Agricultural Department is implementing various schemes on agricultural development in Lakshadweep. The Coconut Development Program is an important scheme for increasing the production of coconut. Lakshadweep being a coconut territory, coconut productivity plays an important role in improving the economic status of the islands. Productivity has almost reached to the saturation level and no uncultivable land is available for converting into cropping area. Increase in population is mounting pressure on resources available in the territory. In order to meet the requirement of growing population for a comfortable life, income generated from copra
alone will not suffice the increasing demand. The only way out is to go for high value agriculture through product diversification and value addition.

Tapping of neera is intrinsically related to the life of the people of Lakshadweep. Tapping is usually done during September to December. Tapping is done at the auspicious of the Agriculture Department and is included under the coconut development programme. Department has fixed the wages of tappers @ Rs. 250 per day and the tapper should collect 10 liter neera per day. Department is giving the farmer Rs.800 for 6 months for neera tapping. Farmers are also giving trees directly for neera tapping.

The expert committee constituted by Government of Kerala under the Chairmanship of Shri. Anil Xavier IAS, Excise Commissioner to study the potential of neera submitted its report to Shri. K Babu, Minister for Excise, Government of Kerala. The committee examined various issues like how neera tapping can be beneficial to farmers, the alcoholic content in neera, production, marketing and export of neera etc. Dr. K Muralidharan, Director CDB was a member of the nine member committee. The committee has recommended that Neera production, processing and marketing can be entrusted with federated Coconut Producers Societies, their Federations, and Producer Companies. As special processing units are required for the collection and processing of Neera, it should not be allowed as a part of toddy parlours. Necessary amendments shall be made in the existing rules on Issue of License for drawing sweet toddy(neera) for enabling neera production, and its value addition. License from the Excise department shall be obtained from the said rule for tapping neera. For the modernization of toddy sector and for the production of neera and value added products from neera, Toddy Neera Development Board shall be established. Cess @ Rs.1 per liter of Indian made foreign liquor may be introduced for funding this Board.

Recommendations of Neera Committee Indian Coconut Journal, May 2013 Source: The Cocommunity

On receiving the report, Shri. K.Babu Excise Minister, Government of Kerala assured that the government will certainly take a positive view of it and will promote the coconut water-based drink Neera as a non-alcoholic health drink.

The coconut tree Cocos nucifera Beccari or coconut belongs to the palm family, Arecaceae (= Palmaceae) which consists of 200 genera and over 2,000 described species (Child 1974).
According to Woodroof (1970) the term coconut is derived from the Spanish and Portuguese word, "coco", which means "monkey/grotesque face", but the plant is known in many countries by local names. For example, it has been known as "naryal" in India for millennia and as "nut of India" by Cosmos, the Egyptian traveler, in AD 545. The tree itself has been described as, "man's most useful tree", "king of the tropical forest", "tree of life", "tree of heaven" and lazyman's crop, inter alia. (Woodroof 1970).

Rangaswami 1977; Kovoor 1983. A Tamil classical poem (Tala Vilasam) composed by Arunachalam in Tamil Nadu is entirely dedicated to the glory of this tree and enumerates 801 articles made from its various parts

"Tree of life", etc. (Rangaswami 1977). Another outstanding example is the coconut palm, for which every part is used. This tree is called in India "Tree of Heaven", "Mankind's greatest provider in the tropics".

(Quimbo 1991). Nypa fruticans is also an outstanding provider of various products which are essential to everyday living and therefore is said to be the mangrove's counterpart of coconut. Palm trees are also often associated with crops and pastures.

(Woodroof 1970, Child 1974). Coconut varieties fall under two broad groups, Tall or typica and Dwarf or nana. Tall and Dwarf coconut types may hybridize to produce intermediate forms. The Tall variety has greater genetic variability as it is usually cross pollinated. The coconut plant is monoecious, producing both male and female flowers. The male flowers are located distally while the female flowers are found proximally on each inflorescence. The type of pollination is determined by the relative maturation times of the male and female flowers. In the Tall varieties the male flowers open before the female flowers, hindering self pollination while, an overlap of the opening phases of male and female flowers in Dwarf plants allows for self pollination and greater tendency toward homozygosity. Coconuts are also named after areas where they are grown long enough to have developed distinctive characteristics, e.g., Panama Tall, West African Tall and Malayan Dwarf (Woodroof 1970, Child 1974). Maypan variety is a hybrid of the Malayan Dwarf and Panama Tall varieties (Coconut Industry Board [Jamaica] 1973).

The traditional commercial coconuts were the Tall varieties which were preferred above the Dwarf varieties because of the quality and quantity of copra they produce (Woodroof 1970).
They normally live for over 60 years, are adaptable to a wide range of soil conditions, fairly resistant to diseases and water stress, and start to bear within six to ten years. The Dwarf varieties come into within three to four years, attain full production by the ninth year and have a life span of about 30 to 40 years. While they show greater susceptibility to some diseases, the Dwarf varieties exhibit greater resistance than the Talls to some viral diseases, including lethal yellowing (Woodroof 1970, Child 1974).

(Hall 1981, Moore and Alexander 1987). Each coconut inflorescence emerges from the base of a leaf and is approximately 120° around from the previous one. After fertilization of the female flowers, each inflorescence develops into a cluster of fruits called a bunch. Occasionally the spikelet of an inflorescence is in direct contact with the spikelet remnants of an older bunch.

(Ghai and Wadhi 1983) The native habitat for the coconut palm is unknown because coconut is dispersed by water, although human activity could be credited for much of its dispersal (Child 1974). Of all the cultivated trees in the world, the coconut palm has the widest geographical range. Ninety percent of the world’s coconut acreage lies within 20° N and 20° S of the Equator (Woodroof 1970, Persley 1992). The crop is best grown within 600 ft. above sea level, with over 1,250 mm rainfall or a high water table on a rich silty loam. Coconut was introduced into the West Indies at the beginning of the 20th Century (Woodroof 1970, Child 1974). The main variety was the Panama Tall found in Guyana, Jamaica, St. Lucia, Venezuela, Trinidad and Tobago. There was also the dwarf variety, with its Yellow, Red (golden), and Green color morphs (Griffith 1982a).

(Chopra and Meindl, 2008). The supply chain includes not only the processor and the suppliers but also the transporters, warehouses, retailers, and even the customers themselves.

Gunasekaran et al. (2008), Bellantuono et al. (2007), Fawcett et al. (2007), Bowersox (2006), Reina and Trck (2004), Wheatley et al. (2004), Woods (2004) and Simchi-Levi et al. (2003). (Mentzer et al. 2004). The overarching goal of the physical distribution function is to effectively and efficiently move products to end customers by eliminating the time, effort, and inventory waste within the manufacturing-distribution system.

According to Fisher (1997), the good performance of an organization is dependent on how it combines effective retail logistics with the choice of suitable supply chains and general practice
of good supply chain management. The process of building customer confidence requires an established reliability of the chosen channels of distribution to ensure constant availability of the goods in good form in the selected outlets.

**In their publication, Razzaque and Sheng (1998)** observed that good coordination of the retail logistics can lead to the reduction of the cost of the products, which may in turn allow the organizations to either gain superior profits or enable them to reduce their prices and in the process gain a competitive advantage over other market players. Good retail logistics can also help ensure constant supply of the goods in the retail outlets. This may help build the customer confidence in such retail outlets hence giving the organizations a strategic advantage in the market through the creation of loyal customers.

(Peter Drucker, 1962). The concept of supply chain management can be attributed to the works of Peter Drucker in his 1962 discussion which viewed distribution as one of the functions of business organizations whose costs could be greatly reduced through the introduction of more efficient systems He focused on the reduction of duplication of functions and the optimization of the properly placed functions in order to ensure a well coordinated and effective distribution system that would be both reliable and cost effective.

Banumathy and Hemameena (2006), while studying consumer brand preference with respect to soft drinks, found that after globalization most of the consumers like the international brands such as Pepsi and coco-cola. Consumers preferred a certain brand or a particular drink mainly because of taste and refreshing ability.

Nandagopal and Chinnaiyan (2003) concluded that the level of awareness among the rural consumers about the brand of soft drinks was high which was indicated by the mode of purchase of the soft drinks by "Brand Name". The major source of brand awareness was word of mouth followed by advertisements, family members, relatives and friends.

The Economic Times (2010), in its news titled, "Companies eye the purchasing power of rural youth" has remarked that high degree of awareness facilitated by communication devices has empowered the youth in the villages. And now youth has grown to be more aware about the branded products and wants high quality products.