



Staying organized - the key to the success of coconut industries in North Sulawesi Province

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The establishments of networked coconut industrial cluster involving participation of competitive forums, working groups, associations of Indonesian coconut farmers and multidisciplinary government departments; such as ministry of agriculture, ministry of industry and ministry of trade with backward and forward linkages is the uniqueness of Coconut Industrial Cluster.

In Indonesia coconut is cultivated for multifarious uses. Farmers utilize the coconut for culinary purposes as well as for making copra for supplying to processing industries. The industries, both large and small scale, utilize the coconut for the extraction of coconut oil, manufacturing of desiccated and other finished products. While small-scale industries face stiff competition in the world market the small farmers are exposed to various challenges like low productivity, declining nature of marketable surplus, uncertainties in market prices and subsequently leading to low level of farm income. The competition from other profitable crops like oil palm and cheaper substitute oils like palm oil also pose

threat to the coconut industries in Indonesia. The government of Indonesia has been striving hard for the past few decades to enhance the competitiveness and comparative advantages of coconut farming and processing industries to increase the income and welfare of the farming communities. Various strategic measures have been introduced at the farm level and industry level. The introduction of integrated coconut processing and coconut industry cluster in the post harvest processing sector has made a dent in the coconut industry of Indonesia. Even though there was initial set backs in the implementation of these programs in Sulawesi for want of continuous supply of adequate quantity of raw material, the major hurdles in the



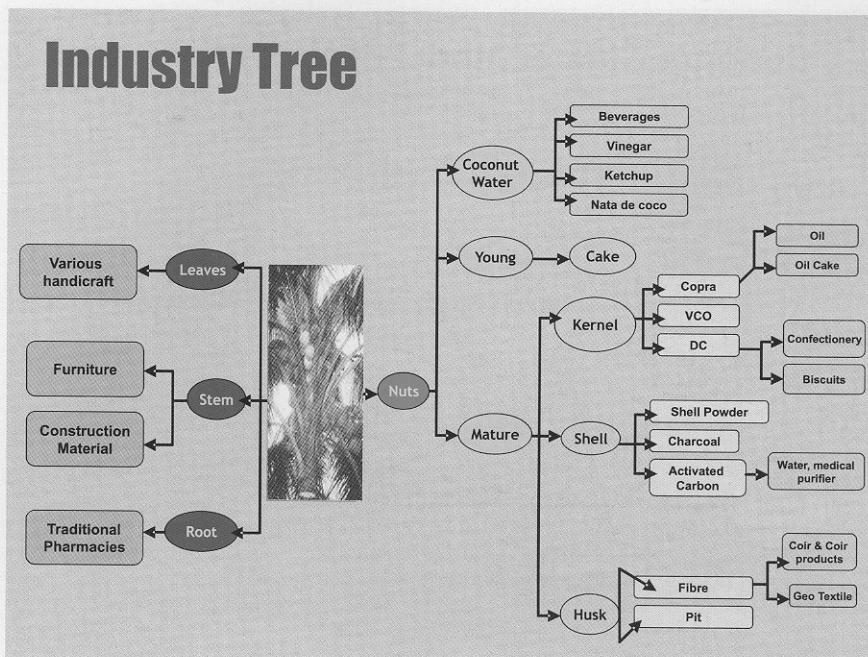
The delegates from India at an industrial cluster where coconut based convenient products are manufactured by Self Help Groups

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supply was removed with the implementation of coconut cluster program through which linkages were made with production and supply with out affecting the regular supply of nuts to meet the daily need of existing large oil milling and DC manufacturing industries.

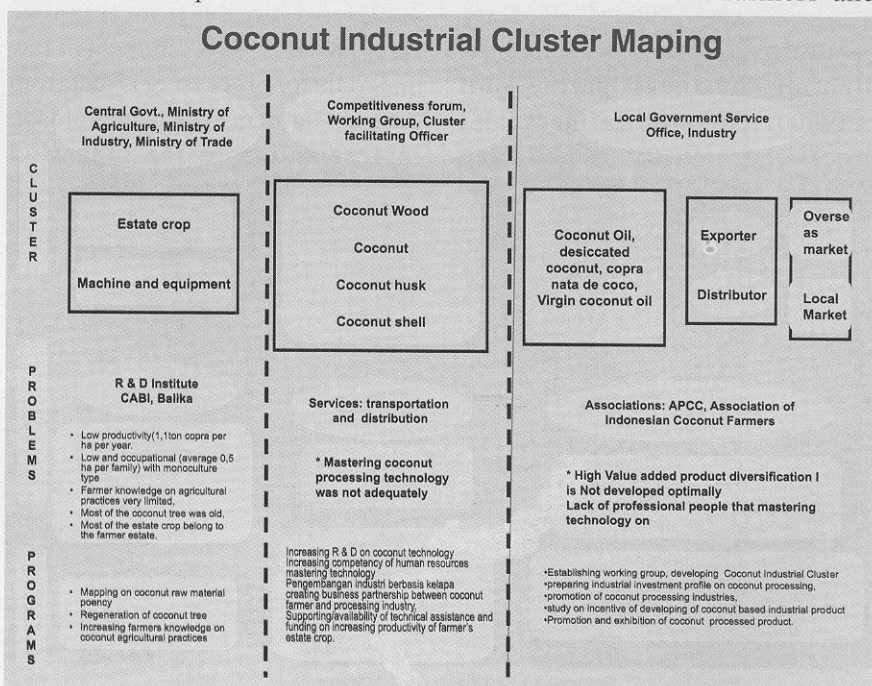
The strength of Indonesian coconut industry is the functioning of various processing industries with significantly higher capacities if not full for the production of varied products. The industries that are registered with the Directorate of Industrial Agro Chemical, Ministry of Industry are; 303 coconut oil industries, 59 copra industries, 9 VCO industries, 5 nata de coco industries, one shredded coconut meat industry, 52 coconut sugar industries and 25 shell charcoal industries besides an equal number of other non listed small scale industries including confectionery industries¹. Because of the price advantage and the quality and quantity of coconut, Indonesia could make an indelible presence in the world market. Indonesia could export many coconut products and by-products. The important among them are; crude coconut oil, refined coconut oil, copra cake, desiccated coconut, virgin coconut oil, coconut cream, coconut milk powder, coconut cream paste, coconut cream square, colada snooze, activated sport drink and activated carbon. Of these, coconut oil, copra, copra cake and desiccated coconut are the major commodities that constitute bulk of the export basket. During 2008, the export of coconut oil reached the record level of 7.763 lakhs MT at an average price of US \$ 1021 per MT. The corresponding prices of



Palm oil and Palm kernel oil at the international market were US \$ 981 and US \$ 988 per MT respectively. The difference between the international prices of palm kernel oil and coconut oil was only 20 per cent which is also an indication that as long as price difference between coconut oil and palm kernel oil in a

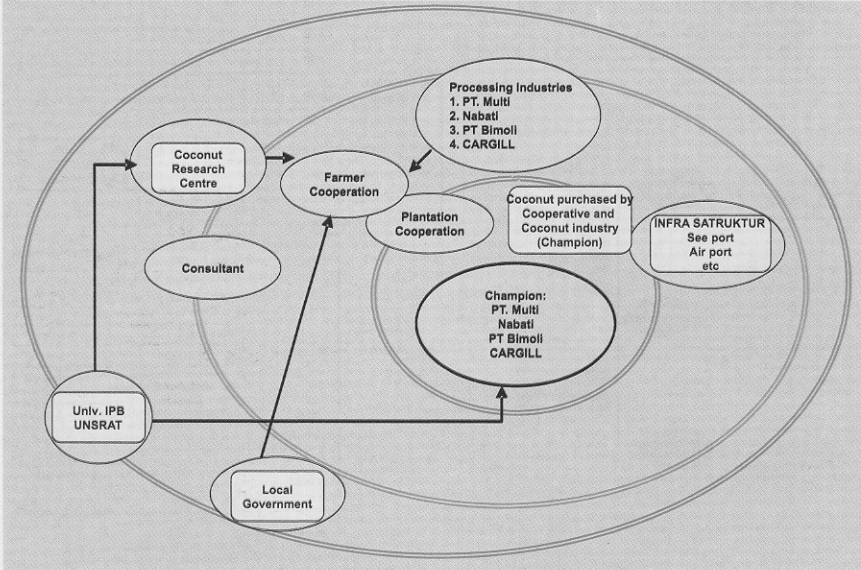
country is marginal ie. 20 per cent or less, then the substitution effect can never cause a reduction in the demand for coconut oil.

The establishments of networked coconut industrial cluster involving participation of competitive forums, working groups, associations of Indonesian coconut farmers and





Coconut Cluster Model of North Sulawesi



multidisciplinary government departments; such as ministry of agriculture, ministry of industry and ministry of trade with backward and forward linkages is the uniqueness of Coconut Industrial Cluster. Mapping of coconut raw material potency, rejuvenation of coconut plantations, strengthening of extension requirement, capacity building for processing sector, creating business partnership between coconut farmers and processing industry, establishing

working groups, preparing industrial investment profile on coconut processing and developing appropriate coconut based industries and suitable marketing strategies are the prime responsibilities of the cluster. The success of various coconut based industries in Manado is mainly on account of their sound backward production linkages wherein the total requirement of raw materials for processing is met from the local farmers. The diagrammatic representation of the industrial



A view of the Mega Mart

cluster as explained by Dr.Hengky Novarianto of Indonesian Coconut and Palmae Research Institute (ICOPRI), Manado and a visit to such production units and Mega super market in Manado indicates the sustainability and success of coconut industry in Indonesia (see the diagrams).

The Author and the other Indian delegates have had the opportunity to visit the Mega Market, one of the biggest Supermarkets in Manado, to survey the coconut based product profile available in the confectionery and bakery sector besides witnessing a cluster unit of confectioneries where individual confectionery units are engaged in the manufacturing of different products under a single umbrella. Unlike India where the major and leading food chain markets, Food World, ITC etc outsource the bakery and convenient food products from cottage level manufactures, the Mega market in Manado houses such confectionery units in the market itself and conduct both the production and sales within the same premises under good hygienic environment. In bakery units, the baking, displaying and selling activities are being carried out in the same premises having distinguished separations with transparent glasses. All activities are clearly visible to every consumer who visits the mart (see figure). The process of making and cooking is also visible to the public. The staff in baking section wear neat white dress, neat white cap, ghouse and mouth cover. All stages in the production processes are carried out under good manufacturing practices, strictly in accordance with well defined protocols and exposed to the



visitors who form the wholesale and retail buyers of the product. It is this manufacturing method which enhances the keeping quality of the product and is considered to be the best marketing strategy in building up credibility and demand for the product among the consumers. The important coconut based food products that are manufactured and sold in the Mega Mart are;

a) Coconut cheese:

This product is made from coconut floor, cheese and wheat floor with proper mixing and softening manually and baked in gas operated hot air ovens. The baking activities are generally manned by men in uniform.

b) Coconut bread:

This product is also made from coconut floor, i.e. desiccated coconut powder and wheat floor with proper mixing with top coating of sugar. Coconut bread is a popular food item of all the island. It is served along with every meal.

c) Coconut based Beverages-

Nata de Coco in cube forms mixed with other chilled fruits and ice-cream are the common fruit beverages served in the major food courts in the island. It is also an important export commodity of Manado. Tender coconut water with other fruit mixture along with the tender coconut kernel is seen a very popular and ideal drink preferred by all people. The tender coconut water and the kernel after separation have been stored in the refrigerated vessels. On demand the beverages are served immediately after mixing the ingredients. Only mixtures, blenders and grinders were used for the preparation of coconut beverages.



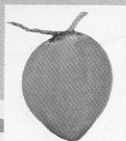
Coconut cheese in the confectionary unit in the Mega Mart



Coconut bread



Tender coconut water beverages



Attractive, elongated glasses were used to serve the drinks. The environment was kept clean and free from flies, dust and other pollutants.

Besides the products explained above, the other coconut based food products which command consistent demand from all over Manado are coconut biscuits, coconut chocolate, palm sugar based products etc. Since all such units are functioning as cluster business-enterprises, the raw material requirement of these clusters are linked to coconut farmers and primary processors for the uninterrupted supply of raw materials at a predetermined parity prices. The innovative models seen in the Supermarket in Manado can be replicated in all the modern food chain markets in India particularly in the important cities in Kerala, Tamil Nadu, Karnataka, Goa and Maharashtra where feeder areas for raw material supply can easily be mapped for regular and steady supply at remunerative and stable prices. The price discovery coupled with an assured income will lead to a multiplier effect in the management of gardens and the sustainability of the enterprises. Such innovative ventures can be considered for assistance from the Coconut Development Board under its Centrally Sponsored Scheme Technology Mission on Coconut.

Coconut Handicrafts emporium:

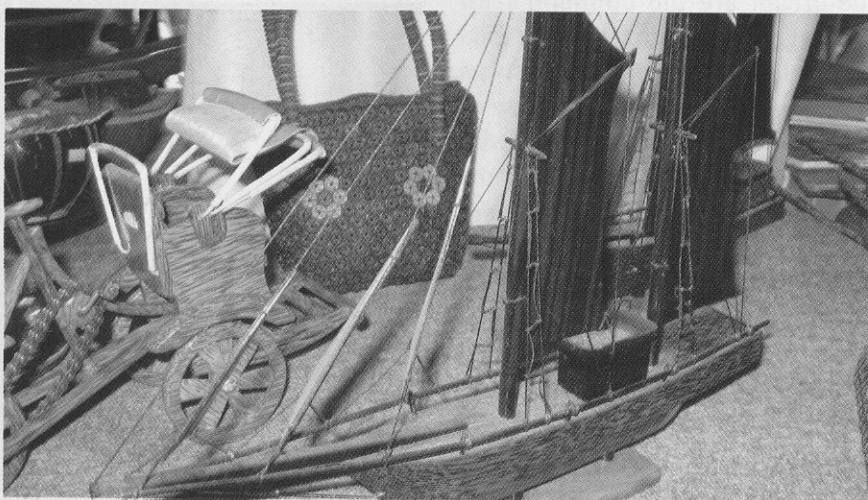
North Sulawesi is one of the traditional coconut growing regions in Indonesia where use of coconut wood in many household applications are popular. Traditionally coconut wood is used for the construction of houses, cottages, furniture etc. In view of

the easy availability of old palms which are above 60 years, many large-scale coconut wood based saw mills and furniture units are set up and working successfully. The furniture made of coconut wood were displayed in the furniture shop in the displayed in the supermarket for sale. They are made of treated sawn coconut logs taken from 60-100 years old coconut trees. The furniture therefore are very strong, with good surface finishing. The major items in the emporium displayed are chairs, tables, cots, book cases, ash trays, tea-poy's etc. The treated mature coconut wood are also used for decorative paneling, for making ornamental flower pots apart from having traditional uses such as for the construction of cottages where wall paneling, doors, roof panels etc are made of coconut wood only. Many cottages and houses in the island utilize the whole treated and finished coconut wood as supporting pillars. Similarly use of decorative coconut pillars in carpet area, corridors and balcony's of multistoried buildings is a common practice that can be observed in Manado.

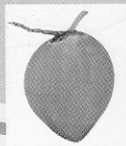


Bookshelf made of coconut wood
Provisional Market:

The provisional shop in the Mega Market is housed in the ground floor. All the amenities including cooling chambers and walk-in coolers are provided for stocking the perishables like fresh vegetables, fish and meat, grated coconuts, coconut milk, coconut ice-cream etc. A major portion of the provisional shop is exclusively set apart for household



A view of the coconut handicraft emporium at the Manado International Airport



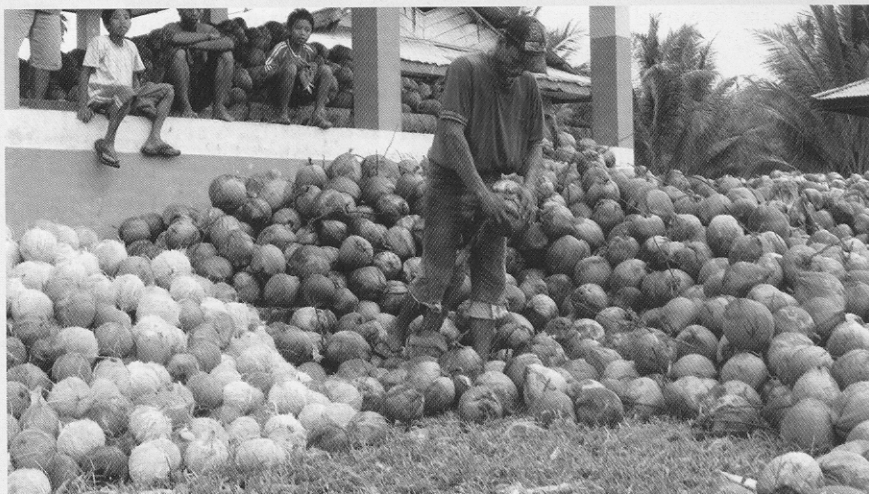
food and beverage items. Various vegetable oils for cooking purposes are show-cased. They are branded and packed in 1 lit, 2 lit, 4 lit and 5 lit pet jerry cans in colours and pet transparent bottles with labels. The major coconut based commodities displayed for sales were;

Packed and preserved Nata, packed in pouches and jars in liquid medium: Nata-de-cocoa is an important ingredient in fruit salad served in all the star hotels and restaurants and largely consumed by all people in the islands including tourists. Even though Nata-de-cocoa has steady market both in domestic market and foreign markets only less than 20 per cent of coconut water, the by-product of copra and desiccated coconut powder manufacturing units are currently utilized for the manufacturing of Nata.

Coconut Jam: The other prominent products displayed in the provisional store were different types of jam. The Coconut Jam made from coconut milk as the main ingredient was seen in good demand. Even though the product has extensive and wider uses, the bulk quantity is utilized along with the bread. The product has a shelf life of 6 months.

Coconut ice-cream: The coconut ice-cream in bulk packs are only sold through the provisional store. They are outsourced from the major confectionery industries. The demand for the ice-cream is mainly from household sector, hotels and restaurants.

Coconut oil and coconut milk: Coconut oil and coconut milk are abundantly used by the people of



Traditional method of de-husking

North Sulawesi, Indonesia. They use these items mainly in culinary preparations and as the major vegetable oil particularly for preparing non-vegetarian food. Frying of fish and meat is only done in coconut oil. The oils displayed in the provisional markets were; olive, sun flower oil, corn oil, palm oil, blended palm oil with soy and sunflower, till and mustard oil, rice bran oil etc. It was noticed that all oil displayed are mainly in one lit small packs, 2lit, 4lit and 5lit bulk packs which indicates the consumer purchasing behavior. On a roving survey among the retail buyers it was found that 99 per cent of the

chicken, beef and mutton and fish curries besides using for frying fish and pork. The majority of the consumers preferred coconut oil for non vegetarian cooking. However, an important characteristic of the coconut oil noticed was that the oil is not solidifying even below 22°C as the mall is functioning under controlled atmosphere. Similarly, instead of labeling the consumer packs as coconut oil, it was labeled as omega-9, omega-6 and omega-3 oils. The prevailing market prices of coconut oil in the retail domestic markets were also collected from the labels and are furnished in the table below.

Name of oil	Price Rupiah per lit (8300 rupiah= 1 US \$)
Olive	83200/lit (10 \$/lit)
Virgin Olive	162500/ 500 ml (39 \$/lit)
Canola	39500/946 ml (5 \$/lit)
Happy Salad oil(Soya)	58325/2 lit (3.5 \$/lit)
Omega9-Omega-6 oil (Coconut oil)	67275/5lit (1.62 \$/lit)
Coconut oil	13700/lit (1.65 \$/lit)
Sunrise Blended Palm oil and soybean oil	79875/4lit (2.41 \$/lit)

consumers were belonging to household sector. It was reported that the major uses of the coconut oil was reported for the preparation of non-vegetarian dishes which includes

The important brands that were displayed in the markets are Bismoli, Mitra and Sania. Even though different brands are made available to consumers, it was noticed that all



brands are owned by a single company. It could be observed that Omega-9&Omega-6 classification of coconut oil is mainly intended for export to certain countries where import of coconut oil is banned. A disguised labeling promotes every chance of export to countries like India where domestic price of coconut oil generally rules higher than the international prices. The colour of coconut oil that was displayed in the provisional market was dark yellow which has no resemblance to the pure Indian coconut oil. Unlike in India, the problem of sedimentation was not seen in any of the packets. A close study of the oil was taken with that of the manufacturer and found that the oil was filtered with proper

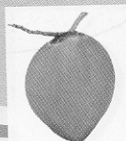
micro-filtration technique under controlled temperature and hence all impurities, including any source of sediments were eliminated completely before packing to sterilized bottles. The Indian coconut oil industries are currently facing the problem of sedimentation. Probably the methods adopted by the Indonesian manufacturers can provide a permanent solution of Indian manufacturers. They may also try to heat the oil at an optimum temperature before filtration and also allow the oil for natural sedimentation as is reported by the Sri Lankan entrepreneurs.

The delegates to 43rd COCOTECH under the leadership of Mr. Dissanayake, the Honorable Minister of Industry, Sri Lanka and the Chairman of APCC had an opportunity to visit a large-scale desiccated coconut powder manufacturing and coconut oil extraction unit owned by PT. TROPICA COCOPRIMA, the only large scale company in the Sulavasi Region involved in the manufacturing and export of coconut oil, desiccated powder, palms oil activated carbon etc. The company owns 4 processing industries situated in high yielding coconut regions of different Provisions of Manado (North and South Sulawesi). Each factory has the installed capacity of processing 1000 MT of copra per day. All the units were operating at their

full processing capacity till recently. However, the recent climatic changes and the epidemic outbreak of but rot in Sulawesi caused considerable damages to coconut palms and affected the productivity of coconut. Hence the processing units are running with 60 per cent capacity utilization for want of adequate quantity of copra. The general practice of procuring the required copra by company is to collect copra through their commission agents employed in various parts of the provinces. In Manado, the farmers produce copra at the farm level and sell to commission agents who in turn supply the same to the factory. The copra processing at the farm level is not as hygienic as in Kerala or elsewhere in India. We visited the processing area of the factory wherein copra was cut into small pieces by hammer mills. There were about 20 hammer mills installed in the factory for cutting 1000 MT copra per day. All the hammer mills and other equipments were fed with the copra through conveyers through silos from where the materials are transported to 40 expellers which are run by pulley. The copra crushing through expeller is done only twice against general practice of three crushing in India. Hence the copra cake contains more than 16 per cent oil which is generally imported into India by Solvent Extraction units. In India the expeller extracted cake contains only 6-9 per cent oil comparing to 16 per cent or more in Manado. The oil produced by the company is crude coconut oil



Mechanical deshealing of coconut



which is further refined in their own refineries, stored in ordinary MS tanks having 30,000 MT from where the oil in bulk is seen directly pumped into the ships anchored in their own ports situated adjacent to the factories. The centralized form of oil extraction, refining, storing and transporting of the products including the byproducts to destinations was helpful in strengthening the power of economy of the company and hence the company runs on high profit. During the refining, the fatty acid obtained is sold to chemical factories, pharmaceuticals, detergents and soap industries locally and abroad. The major buyers of refined coconut oil are USA, Canada, Malaysia and Japan for their chemical and cosmetic industries. The company is also running palm oil extraction units and refineries. It was reported that Bombay oils, Hindustan liver, Shalimar and a few major buyers from Calicut have been regularly importing palm oil from this company. The entire supply of coconut oil and other vegetable oils in NSP region is met from this company.

The finest desiccated coconut of Indonesia is produced by the PT.TROPICA COCOPRIMA. The DC plant was set up in 1997 and their average monthly capacity is 275 MT desiccated coconut powder. The company is HACCP certified and owns independent quality testing Lab for testing the raw material as well as the finished products. Apart from coconut oil and DC the company produces granulated and cut products of DC



Shell charcoal unit for heat generation

for topping, filling, texturing of candies, cake, pastries, cookies, dessert, chocolate bar etc. The important export destinations of the company are Angola, Australia, Belgium, Egypt, Germany, Hungary, India, Japan, Korea, Malaysia, Netherlands, Poland, Russia, Saudi Arabia, South Africa, Singapore, Sri Lanka, Turkey, United Arab Emirates, United States of America and the Netherlands.

It is understood that currently; the company is facing acute shortage of copra on account of the decline in the production of coconut due to the outbreak of bud rot and price declining. To meet the daily processing requirements and to fulfill the supply orders according to the long term agreement executed with the buyers from the importing countries, the company has been importing copra from Bangladesh at times of short supply, the sources of which was not revealed. On the spot physical examination of the copra kept in the factory for oil extraction indicated that the quality of copra when comparing with that

of India was far below the Indian Ag-mark specified FAO grade copra and the oil produced in crude form was dark which was further bleached and deodorized

Display cum Sales Counters at Airport:

The coconut handicraft items have occupied prominent place in the handicraft emporium at the International Airport in the Manado. Many fancy items in the Airport; such as electrical shades, dustbins, ashtrays, file racks, tables, chairs, announcing desk and various counters etc. are made of coconut wood. The decorative hanging lights fitted at the inside roof of the airport lounges and other prominent places were made of coconut wood. The porticoes of the relief areas are also constructed with coconut wood. Thus the commercial utilization of coconut stem wood in NSP ensure better price to coconut wood when it becomes old and unproductive. The handicraft emporium at the Airports, displayed various items such as coconut wood plates, trays,



coconut wood jars etc which were made of coconut stem wood and shell. The shell based handicrafts were key chain, purse and curios. All the counters were manned by sales girls and owned by individual entrepreneurs. The book cases in the book stalls were also made of coconut wood. Thus the wood utilization for value additions in Manado is an emulating model which can be adopted in Kerala and A&N Islands where replanting and rejuvenation program is in the take off stage. However, the available artisans in the country are not adequately skilled to attain the standards and finishing as was witnessed in Manado.

Harvesting Practices:

The farmers in Indonesia are harvesting their coconut palms once in three months and therefore only 4-5 harvest are being taken in a year. Due to the shortage of climbers, on every harvest the climbers harvest 3-4 bunches with out checking the right maturity. Hence the copra produced by the farmers consists of about 40

per cent rubbery copra with lot of fungus and external contaminants. It was informed by some of the experts in the Island that because of the poor quality of copra due to immaturity of the nuts, the coconut oil has high iodine value. Since Manado is experiencing regular and intermittent rains the farmers adopt sun drying as well as traditional type of Kiln drying by using the shell, husks and other materials as fuels. Hence the quality of copra comparing to Kerala and Tamil Nadu is much inferior.

Acknowledgement

Acknowledgements are due to Dr. Romulo N Arancon Jr. Executive Director, APCC who is instrumental in making the field visit highly educative and successful.

Thanks are due to Dr. Deddy Saleh, Head, Commodity Futures, Trading Regulatory Agency, Ministry of Trade, Indonesia who has arranged the field trip for the Cocotech delegates to Coconut processing Industries. Thanks are also due to Lito F Cupon, Plant Manager, PT Tropica Coco Prima, Jalan Raya

Trans Sulawesi, Indonesia, (tropica888@hotmail.com), M/s. PT Multi Nabati Sulawesi, Jl. Raya Madidir, Sulawesi Utara, Indonesia (eugine.macalisang@wilmar.co.id), Ev. Drs. Herman Kemala, Merciful Building, Manado, Sulut (mercifulbuildings@gmail.com) for allowing the delegates to witness the cluster level manufacturing of convenient food products and the industrial level of processing of convenient food products, Felix Fernandopulle, Chief Executive Officer, Kudawewa Mills, Kudawewa, St. Catherins, Thoppu, Kochchikade, Ismail Maskromo, Kepala sesksi, Kompleks Baltitka Kaiwatu No.66, Kairagi Dua Mapanget Manado (is_maskromo@yahoo.com) for providing valuable information.

Notes & References

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Plant Protection - Root (wilt) Disease

Symptoms : Abnormal bending or ribbing of the leaflets, flaccidity of the leaves, general yellowing followed by marginal necrosis of the leaflets. Abnormal shedding of buttons, reduced leaves and crown, gradual reduction in yield.

Control Measures : Being a non-lethal, debilitating disease an integrated approach is to be followed for management of root wilt. Recommended control measures for leafrot disease as this disease gets superimposed on most of the root wilt affected palms. Follow integrated nutrient management apply organic manure @ 50kg / palm / year. Apply balanced dose of chemical fertilizers i.e. 500g Nitrogen (1.1kg urea), 300g Phosphorus (1.7kg Mussouriphos), 1000g Potassium (1.7kg Muriate of potash) in two splits - 1/3rd during April-May and 2/3rd during September-October under rainfed condition and in four splits during January, April, July and October under irrigated condition. In addition to this 500g MgO (1kg Magnesium sulphate) also has to be applied along with second dose of fertilizer application. Cut and remove disease advanced, uneconomical palms yielding less than 10 nuts per palm per year. Grow green manure crops - cowpea, sunhemp (*Crotalaria juncea*), Mimosa invisa, Calapagonium mucanoides, Pueraria phaseoloides etc. may be sown in coconut basins during April-May and incorporated during September-October. Irrigate coconut palms with at least 250 litre water in a week. Adopt suitable inter/mixed cropping in coconut gardens. Provide adequate drainage facilities.