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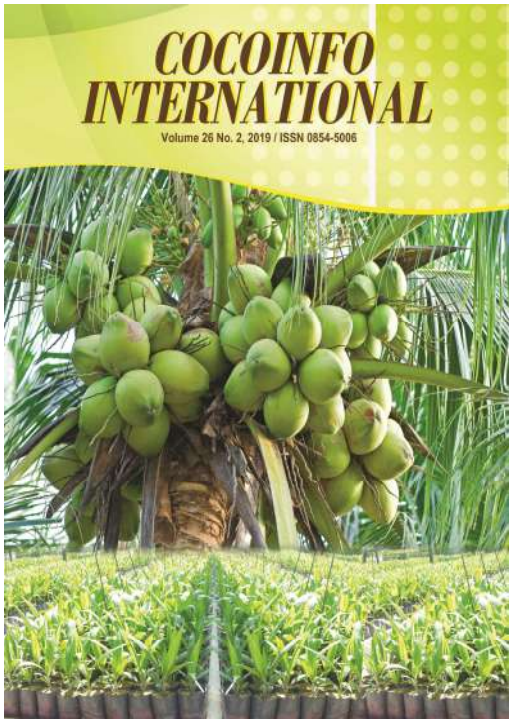

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From the Editor-in-Chief

EMBRACING UN 2030 AGENDA COMMUNITY DECLARES 'COCONUT FARMERS NEED NOT BE POOR'

It has been a great privilege to have served as the Editor-in-Chief of the COCOINFO International publication in my capacity as the Executive Director of ICC since 2014. This would be my final editorial prior to my retirement from office in January 2020. Last September ICC compiled and published a 50-Year supplement of COCOINFO International consisting of selected articles since its inception that were considered relevant to the industry going forward. This has prompted me to mention a few of these subjects in this Editorial.

Replenishing of palm population as a result of senile, deceased and non-productive palms, has been a serious concern over the last two decades, worsened by little or no action taken by communities to replant. Programs announced by countries for implementation were either inadequate in quota to replace palms, short-planted due to supply or not undertaken in some instances. The industry is therefore not in any better situation today in terms of replanting. The hybridization program was unsuccessful in most countries hence 'back to the drawing board' for many to first chose what varieties would meet the production and product demand for planting by farmers. Indonesia, Malaysia, Sri Lanka, Philippines and other countries have since developed local hybrids recommended to farmers, regrettably present seed garden capacities are unable to provide adequate supply.

ICC estimates over 700 million seedlings are required to meet outstanding plantings unfortunately the total seed garden capacity globally can only to supply 1% of demand. The industry has therefore desperately reached out to the scientific community who have been conducting biotechnology research over the last 40 years seeking solution through Coconut tissue culture for micro propagation by which plant material could be mass produced to be able to meet the demands. ICC believes that this is the most appropriate way forward and that biotechnology would be the major solution towards supply of planting material produced on commercial scale. Highly trained Coconut Development Officers are now needed in countries that wish to seriously pursue sustainable development and achieve viability for all actors along the Coconut value chain. Knowledge, technology and experience is needed in all aspects of agribusiness and agroindustry. The compatibility of Coconut agriculture, industry and commerce with its alternate economic activities such as livestock, poultry, fisheries, food crop (fruits, nuts, vegetables) and MSME-based interventions indicate very positive outlook and considered commercially viable. This approach should ensure that poverty alleviation measures are in place for farmers to prosper.

Innovative technology, smart farming, best practices management and new product developments are enabling the industry to position well for future sustainability. The onus would be on Governments to follow through with enabling conducive environment that would empower the industry to thrive and sustain over a long term thus contributing well towards the nation's economy.
The first-time external donor funding from the Australian Government through its Department of Foreign Affairs and ACIAR commences in 2020 to assist in revitalizing COGENT operations relating to the conservation and utilization of coconut germ plasm currently held in the 5 region based international coconut gene banks as well as collaboration with selected national coconut gene banks.

External agencies, governments and institutions continue with efforts in partnership to counter infestation of pest and diseases such as the CRB-Guam type and Lethal Yellowing which among other concerns are threatening industry production. Effective transfer of know-how to farmers would ensure the correct first respondent is equipped and enabled to take affirmative actions that prevents such extensive damage to crop.

ICC is encouraged by the efforts of the private sector and industry in keeping the Coconut business alive and well so that farmers continue to market their produce economically. With my best wishes for all.

URON N. SALUM
Executive Director and Editor in Chief

PLANTING COCONUTS FOR LIFE-LONG FINANCIAL BENEFITS

Femi Ibirogba

*Coconuts, like many other perennial agricultural economic crops, are low capital-intensive, easy-to-**do and life-long sources of***

Varieties of coconuts

According to breeder Ramu Thampalayagowder, Assistant Director of Agriculture at Department of Agriculture, Government of Tamilnadu Chennai Area, India, there were basically two varieties of coconuts, tall and dwarf.

The tall coconut varieties start producing inflorescence in five to nine years after planting, whereas dwarf coconut varieties do produce inflorescence in two to three years after planting. Explaining why the dwarf coconut varieties produce more fruits, Thampalayagowder said dwarf coconut produces leaves (fronds) and bunches in rapid succession that even the pollen produced in the successive bunches can fertilise the female flowers in the lower bunches in the same coconut tree .

"This is the reason why the dwarf coconut variety produces more nuts/fruits per tree per year; 40 fruits per bunch in 17 bunches under ideal conditions. These would give about 680 fruits/ nuts per tree. The average yield of tall coconut, he said, is 60 fruits/nuts per tree per year and it is in the range of 80 to 100 in some places.

Hybrid coconuts

The Indian breeder explained that "When dwarf coconut is bred with fertile and well performing tall coconut, the resulting hybrid possess characters of both the parents." The characteristics of hybrid coconuts include early maturation, fruiting between two and four years, unlike five to nine years waiting period for the tall varieties; more kernel and oil content, the characters acquired from well performing tall coconut varieties; more number of bunches and fruits per tree yearly, characters acquired from

dwarf varieties and life period of 40 to 50 years, acquired from tall coconut tree that lives up to 100 years. Though hybrid coconuts produce fewer fruits, the fruits/nuts are bigger than those of the dwarf varieties.

Why investing in coconut plantations?

Most coconuts trees in Nigeria are the wild tall varieties that produce scanty fruits which are not adequate for direct consumption as food, let alone for industrial processing and expert A promoter of coconut plantation in Nigeria, who runs First African Coconut idea, Mr Anthonio John-Bede, said investigation in Lagos and other main cities reveal that Nigeria imports coconuts from Benin Republic, Togo and Ghana, and that nothing is available for industrial or export purposes. This, John-Bede said, is a strong reason for young and middle-aged Nigerians to invest in the business that can bring about life-long opportunities of stable and steady income to thousand of Nigerians; help build value chain around the coconut industry and create thousands of job opportunities for young Nigerians and women.

Coconut plantation in Kerala

Economics of coconut farming

One hectare of land, that is about two and a half acres, will accommodate 200 trees of coconuts in low density plantations. In the high density plantations, about 280 to 300 trees are planted on one hectare of land, while 450-480 trees of coconuts are planted on one hectare in the ultra-high density plantations. John-Bede, while explaining the economics of coconuts on one hectare of land using the low density population (200 trees per hectare), says fruiting and harvesting would start in the fourth year if hybrid varieties are planted.
Conservatively, each tree would produce about 200 coconuts in a year, and the nuts would increase as the trees mature in age, bearing fruits for no fewer than 60 years. He said at least each nut would be sold at the rate of N80. This will generate an annual income of between N2.4 million and N3.2 million annually. This income, he argued, would be augmented by arable crops such as potato, yam, beans and vegetables that could be intercropped with coconuts trees.

He described coconuts plantations as almost maintenance-free, compared with cocoa plantations which require all kinds of chemicals against fungi and bacterial diseases with intensive labour requirement. The investment, he added, could take care of future pension income for those running individual businesses that are not pensionable; could take care of future school fees and child support; and could be used by the public and private entities to create employment and for reforestation programmes. “In-between coconuts trees spacing, sweet potato, vegetables, pineapples, pawpaw, oranges and coffee could be grown,” he said.

To plant one hectare of land with coconuts would cost about N500,000, covering seedlings, logistics, planting, supervision and insurance coverage, excluding the cost of the land. Affirming the agro-economic benefits of coconuts plantations, the acting Executive Director of the Nigeria Institute for Palm Research, Benin City, in Edo State, Dr Celestine Ikuenobe, said Nigerians have not maximized the business opportunities in coconut as an economic tree. He too said conservatively, a coconut plantation of 200 trees, even with the poorest variety, would give the owner nothing less than N1.6 million in a year. He urged Nigerians, especially in the South and coastal areas, to plant more coconuts in large numbers to maximize of America, presenting a huge opportunity for Nigerians to key into its production, commercialization and exportation. the economic potentialities of the tree crop. John-Bede said coconuts are in high demand in the United States.

The Pomeroon Seedling Nursery (coconut seedling), Gunaya

50TH ANNIVERSARY COMMEMORATION

Mridula K[1]. and Muhartoyo[2]
[1.] ICC Assistant Director
[2.] ICC Documentalist

Ms. Armida Salsiah Alisjahbana, Executive Secretary, UNESCAP Congratulating ICC for its 50th Anniversary

The 50th Anniversary Commemoration of ICC was arranged back to back with the 55th ICC Session & Ministerial Meeting in Manila, Philippines. The occasion was facilitated by **Mr. Uron N. Salum**, Executive Director, ICC. The occasion was attended by **Mr. Gonzalo.T. Duque,** PCA Administrator, National Ministers and Senior Officials that included **Hon. Lopaoo Natanielu Mua**, Minister of Agriculture and Fisheries, the Government of Samoa, **Hon. Clezy Cleveland Rore,** Minister of Commerce, Industry Labour and Immigration, the Government of Solomon Islands, **Hon. Henry Jons Amuli.,** Vice Minister for Agriculture and Livestock, the Government of Papua New Guinea, **Hon. Vadivelu Suresh**, State Minister of Plantation Industries, the Government of Sri Lanka, **Hon. Viam Pillay,** Assistant Minister for Agriculture, Government of Fiji. Delegates and participants included Senior Government Officials of ICC member countries and Official Observers.

Mr. Uron N. Salum, ICC Executive Director, Giving Speech to initiate the 50th Anniversary Commemoration

Mr. Uron N. Salum, ICC Executive Director, in his official introduction of the 50th Anniversary Commemoration expressed his sincere gratitude to the host Government of the Republic of Philippines through Secretary Dr. William Dar, Minister for Agriculture for the excellent arrangements and wonderful hospitality. He stated that "we are here today as a legacy of forefathers, leaders and dedicated coconut people who have gone before us. We give immense credit to them. We take on the baton from them after 50 years since the inception of the Community with its first Session held on 2nd September 1969. We shall journey another 50 years. The Tree of Life is becoming more and more important each day, month and year. This week the Ministerial Meeting and Session of Delegates should set a new course. The coconut sector must thrive and be vibrant so that the *Coconut Farmers Need Not Be Poor*. We pray God's blessing and guidance on this week of deliberations." He wished all participants a fruitful week of meetings and events.

Ms. Armida Salsiah Alisjahbana, Executive Secretary, UNESCAP delivered her message by video in this occasion. She congratulated the

Member Country Delegates and Distinguished Guests

International Coconut Community on its 50th Anniversary**.** When the ICC was created in 1969, its ambition was to harness the economic potential of a plant critical for the food security, culture and traditions of peoples across the region. She said that the ICC has lived up to this ambition. Its 19 coconut producing member countries now account for over 90% of world's production and exports of coconut products. Productivity has increased, products have been diversified, quality standards have improved, and coconut research has been deepened. UNESCAP is looking forward further successes in the ICC's work across Asia and the Pacific, including to tap this special plant's health benefits. At the United Nations Economic and Social Commission for Asia and the Pacific, UNESCAP are committed to working with all development partners to support this work. She wishes the ICC another successful 50 years in promoting a crop so important for Asia - Pacific region.

Mr. Romulo N. Arancon Jr. former Assistant Director and Executive Director congratulated all the leaders on this occasion and being part of the launching of International Coconut Community. In his message he referred some of the important recommendations of the APCC session which help for the development and prosperity of coconut industry in the countries. He stressed upon the decision of the 43rd APCC Session held in PNG wherein PNG declaration signed by all the Delegates to accelerate replanting program in the countries. He requested that to speed up the development of coconut sector every country should include the coconut program in the priority National Development Country Policies and Plans. International Development agencies was also to be tapped to support the coconut sector. He appreciated the wonderful hospitality of the Philippines Government.

Mr. Romulo N Arancon, Jr. , former Executive Director Delivering His Anniversary Message

Mr. Muhartoyo , ICC Documentalist, Delivering his Reflection Speech.

Now that APCC is elevated into ICC its mandates to promote, coordinate, and harmonize the activities of all coconut industry which sustain the lives of millions of small farmers as well as those engaged in the industries have indeed become more challenging. Value addition, processing and marketing of high value coconut products should be encouraged and supported. More program to be included and initiated for improving the productivity level of the plantations. He mentioned that Thailand is having more coconut industries and the other countries can learn from them and share the experiences with the stakeholders and farmers. Since now ICC has reached into global level so more concentration needs to be given for the betterment of the coconut farmers and industry in coming years. He congratulated the entire coconut community on 50th anniversary and wished more success in future.

Mrs. Hartati, ICC Office Assistant, Receiving Long Service Recognition Award

Mr. Muhartoyo, Documentalist of ICC Secretariat delivered his reflection speech on behalf of the long serving staff of the Secretariat. In his message he shared his experience in ICC during his long service carrier. He joined ICC then APCC in 1996 and was entrusted with the implementation of the project on Information Networking through Electronic Media in which the first ICC website development was one of the project components in addition to publication and documentation work. During his tenure he happened to meet so many coconut growers; stakeholders, experts and leaders with opportunity to learn. He expressed his sincere gratitude to former Executive Directors, colleagues, member countries, and stakeholders for their friendship, mutual cooperation and support during his tenure. He added that his time was very well spent in ICC and he would treasure his experience, knowledge, personal and professional development for the rest of his life.

On the ocassion of 50th Anniversary Commemoration ICC acknowledged the contribution and services of Individuals; Corporate Organizations and National Institutions.

Hon. Vadivelu Suresh, State Minister of Plantation Industries, Sri Lanka presented the 'Tree of Life' Awards to three catagories which included Corporate Organizations; National Institutions and Individuals.

Corporate Organizations receiving the awards were : (a) Franklin Baker Philippines; (b) P.T.Sambu Group, Indonesia; (c) United Plantations Berhad, Malaysia and (d) WM Middleton & Sons Limited, PNG. National Institutions serving 25-50 years or more in the coconut sector awarded were : (a) Philippines Coconut Authority, Philippines; (b) Coconut Research Institute Sri Lanka; (c) Coconut Development Board, India; (d) Coir Board of India; and (e) Coconut Industry Board, Jamaica.

Individuals awarded were; (a) Dr. L.C.Priyanthie Fernando, Former Director, Coconut Research Institute of Sri Lanka; (b) Dr. Ponciano A Batugal, Chairman, ICC Technical Working Group; Philippines(c) Dr. Narong Chomchalow, Chairman Conservation and Development of Coconut Oil of Thailand Forum;Thailand (d) Engr. Divina D. Bawalan, Free Lance International Consultant; Philippines and (e) Mr. Joseph Bae, Pioneer and long serving Copra Marketing Board Official of PNG.

Hon. Clezy Cleveland Rore, Minister of Commerce Industry, Labour & Immigration, Solomon Islands presented the Service Recognition Award to the former Executive Directors. The awards received by were (a) Dr. P.Rethinam served during 2002-2006; (b)Mr. Romulo N Arancon Jr worked with the Secretariat as Executive Director during 2006- 2013 and Assistant Director during 1996-1999. Two ICC staff members receiving Long Service Recognition Award were Mr. Muhartoyo, Documentalist and Mrs. Hartati,Office Assisatnt.

Indonesian NLO Receiving The Tree of Life Award on Behalf of Sambu Group Company

Mr. Gonzalo T. Duque, PCA Administrator, Receiving The Tree of Life Award Accompanied by His Staff

Dr. Ponciano A. Batugal Receiving The Tree of Life Award

Hon. Lopaoo Natanielu Mua, Minister of Agriculture of Samoa presented Certificate of Accreditation to 12 organizations which qualified for accreditation with whom ICC has formalized relationship through an MoU. The partner relations enable the Community to expand productive activities, visibility and serves its stakeholders in a cost-effective manner. The organizations that included (a) Australian Centre for International Agriculture Research (ACIAR); (b)The Pacific Community (SPC); (c) Centre for Agriculture and Bioscience International (CABI); (d) Melanesian Spearhead Group (MSG); (e) Bioversity International; (f) Centre de Cooperation International en Recherche Agronomique pour le Development (CIRAD); (g) Centro de Investigacion Cientifica de Yucatan (CICY); (h) Caribbean Agriculture Research & Development Institute (CARDI); (i) Kopek Kelapa-Coconut Coalition of Indonesia; (j) United Coconut Association of the Philippines Inc (UCAP); (k) Conservation & Development of Coconut Oil of Thailand Forum (CDCOT); and (l) Consortium of Coconut Farmer Producer Companies, India. The certificates were received by the respective representatives of the organizations present during the occasion.

Mr. Uron N. Salum, Executive Director presented Plaques of Appreciation to **Hon. Dr. William D. Dar,** Secretary of Agriculture as Chief Guest at the Session. **Mr. Gonzalo T. Duque** received the plaque on his behalf. ICC Plaques of Recognition were presented to the **Hon. Lopaoo Natanielu Mua**, Minister of Agriculture, Samoa; **Hon. Clezy Cleveland Rore**, Minister of Commerce Industry, Labour & Immigration, Solomon Islands **Hon. Vadivelu Suresh**, State Minister of Plantation Industries, Sri Lanka ,**Hon. Viam Pillay**, Assistant Minister of Agriculture, Fiji and **Hon. Henry Jons Amuli.,** Vice Minister for Agriculture and Livestock from the Government of Papua New Guinea**.**

Mr. Uron N. Salum, Executive Director and **Mr. Gonzalo.T. Duque,** PCA Administrator officiated in the release of 50 Years Publication for CORD; COCOINFO and Coconut Journey 1969-2019.The nine regular publications were also released on this occasion and presented to **Mr**. **Roel.M. Rosales,** Deputy Administrator**.**

Congratulatory messages by the National Ministers present on the occasion were delivered in the following manner:

Hon. Lopaoo Natanielu Mua, Minister of Agriculture, Samoa congratulated ICC and all the

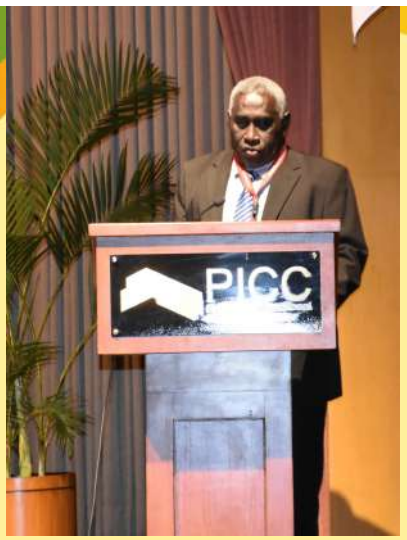
Mr. Uron N. Salum, ICC Executive Director, Handing Over the Newly Released ICC Golden Jubilee Books to Mr. Gonzalo T . Duque, PCA Administrator, as Chief of ICC

member countries on behalf of his country. He urged that this is the time Coconut industry to work together and move forward for the development of the sector.

Hon. Vadivelu Suresh, State Minister of Plantation Industries, Sri Lanka congratulated ICC and all members of the Community on its 50th anniversary. He stated that coconut is an important cash crop for Sri Lanka. The soil of Sri Lanka is very much fertile and suitable for coconut cultivation. Each and every part of the coconut is useful. The major product produced in Sri Lanka is VCO; copra;

DR. P. Rethinam, Former Executive Director Receiving Service Recognition Plaque

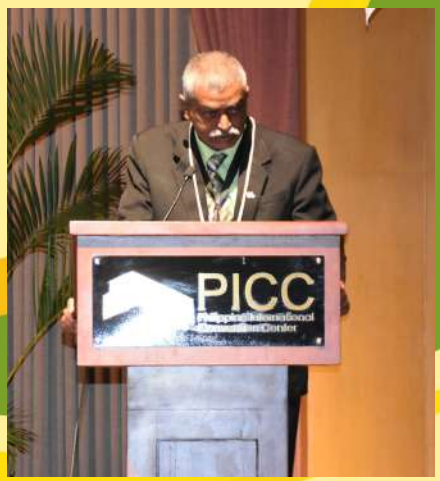
***Hon. Vadivelu Suresh**, State Minister of Plantation Industries, Sri Lanka*



Hon. Clezy Cleveland Rore, Minister of Commerce Industry, Labour & Immigration, Solomon Islands .

Hon. Lopaoo Natanielu Mua, Minister of Agriculture, Samoa

Hon. Henry Jons Amuli., Vice Minister for Agriculture and Livestock from the Government of Papua New Guinea.



Hon. Viam Pillay, Assistant Minister of Agriculture, Fiji

Congratulatory Messages from Ministers Gracing the ICC 50th Anniversary Celebration

coconut oil; Desiccated Coconut powder; shell products and coir products. In Sri Lanka 70% of the production is used for daily consumption.

He thanked the Philippines government for the wonderful hospitality and expressed his gratefulness to all fellow Ministers and representatives of member countries for sharing and exchanging important thoughts.

Hon. Clezy Cleveland Rore, Minister of Commerce Industry, Labour & Immigration, Solomon Islands expressed congratulations on behalf of his country to ICC and all member countries. He thanked the Philippines Government for the hospitality and arrangements. He stated that this is the platform where everyone can share their ideas and experience and exchange the thoughts for the better development of the sector.

Hon. Henry Jons Amuli., Vice Minister for Agriculture and Livestock from the Government of Papua New Guinea**.** He thanked ICC for inviting him on this occasion and thanked the government of PNG for deputing to this meeting. He also thanked all his fellow Ministers for sharing their experiences and expressed his appreciation to Philippines Government for wonderful hospitality and arrangements. Since ICC now grown to international level more policies and program to be framed for the betterment of the coconut sector. He wished everyone a productive session and safe stay in Manila.

Hon. Viam Pillay, Assistant Minister of Agriculture, Fiji thanked everybody and honoured to be part of this wonderful event. He congratulated ICC and all member countries on this occasion. He expressed his thanks to Philippines Government for the wonderful hospitality.

THE LAUNCHING CEREMONY OF INTERNATIONAL COCONUT COMMUNITY

Mridula K[1]. and Muhartoyo[2]
[1.] ICC Assistant Director
[2.] ICC Documentalist

A land mark decision was taken in the 53rd APCC Session/Ministerial Meeting held in Kiribati during 23-28 October 2017. It signified the shift of the Community from regional body into an international entity. The Session unanimously resolved to establish a global institution to be named 'International Coconut Community', by invoking an amendment to Article 5 thus removing the geographical boundaries defining membership qualification.

Following the unanimous endorsement to go international, the Plenipotentiary Delegates signed a resolution on the decision which was then sent to the Treaty Office of the United Nations for the final administrative process. The UN Treaty Office responded with the Depository Notification dated 20th March 2018 since then Asian and Pacific Ccoconut Community was officially graduated into the International Coconut Community (ICC). The 54th APCC Session/Ministerial Meeting held in Malaysia during 24-28 September 2018 decided that the ceremonial launch of ICC to be held in 2019 in Manila , Philippines and Mr. Roel M. Rosales, Philippine Plenipotentiary Delegate, conveyed the readiness of the Philippines to facilitate the launching ceremony.

On Wednesday, 28 August, the ceremonial launch of International Coconut Community was organized back to back with the 55th ICC Session & Ministerial Meeting in Manila, Philippines. The occasion was observed as **"Pacific Night"** at Diamond Hotel Ballroom.

The ceremony was facilitated by **Mr. Uron N Salum**, Executive Director, ICC. The occasion was attended by **Mr. Gonzalo.T. Duque,** PCA Administrator , National Ministers that included **Hon. Lopaoo Natanielu Mua**, Minister of Agriculture and Fisheries from the Government of Samoa, **Hon. Clezy Cleveland Rore,** Minister of Commerce, Industry Labour and Imigration, from the Government of Solomon Islands, **Hon. Henry Jons Amuli.,** Vice Minister for Agriculture and Livestock from the Government of Papua New Guinea, **Hon. Vadivelu Suresh**, State Minister of Plantation Industries from the Government of Sri Lanka, **Hon. Viam Pillay,** Assistant Minister for Agriculture, Government of Fiji. Delegates and participants included Senior Government Officials of ICC member countries, Official Observers, the officers and staff of Philippines Coconut Authority and Department of Agriculture, Government of Philippines also attended the function.

On this occasion, gala dinner was organized in which cultural performances were presented. The pacific dance was performed by the Manus Pohowa Dancing Group of nine members from Papua New Guinea. The group performed the traditional dance of Papua New Guinea. Some local artists from Philippines also performed on the occasion.

The Launching was Signified by the change of logo

HIGHLIGHTS OF 55TH ICC SESSION & MINISTERIAL MEETING

Mridula K.
ICC Assistant Director

Group Photo of Plenipotentiary Delegates and observers

ICC Session & Ministerial Meeting is the highest decision-making body of the Community and is held annually to discuss, deliberate and take policy decisions on the activities to be undertaken by the Community for the sustained development of the global coconut sector. The countries are represented at the Session by the Honorable Ministers of Agriculture/Trade/Commerce, Plenipotentiary Delegates authorized by the National Governments and Senior Officials from the concerned Ministries.

The 55th ICC Session & Ministerial Meeting was hosted by Ministry for Agriculture and Philippines Coconut Authority, Government of Philippines who is the Chair of ICC during CY 2018-2019. The Session was organized at the Philippines International Convention Centre (PICC) Manila, Philippines during 26-30 August 2019.

The 55th ICC Session & Ministerial Meeting was attended by National Ministers and Senior Officials that included Secretary of Agriculture, Philippines, Dr. William D. Dar, Hon. Lopaoo Natanielu Mua, Minister of Agriculture and Fisheries from the Government of Samoa, Hon. Clezy Cleveland Rore, Minister of Commerce, Industry Labour and Immigration, from the Government of Solomon Islands, Hon. Henry Jons Amuli, Vice Minister for

Secretary William D. Dar giving his Inaugural Speech

Plenipotentiary Delegates of ICC Member countries at the 55th Session in Alphabetical Order

Agriculture and Livestock from the Government of Papua New Guinea, Hon. Vadivelu Suresh, State Minister of Plantation Industries from the Government of Sri Lanka, Hon. Viam Pillay, Assistant Minister for Agriculture, Government of Fiji.

Delegates and participants included Senior Government Officials of ICC member countries and Official Observers from the Centre for Agriculture and Bioscience International (CABI), United Nations Conference on Trade & Development (UNCTAD), The Pacific Community (SPC), Centre de Investigacion Cientifica de Yucatan (CICY), Australian Centre for International Agricultural Research (ACIAR), French Agricultural Research Centre for International Development (CIRAD), Caribbean Agricultural Research & Development Institute (CARDI), Melanesian Sphearhead Group Secretariat (MSG), International Treaty on Plant Genetic Resources for Food & Agriculture (ITPGRFA), Conservation and Development of Coconut Oil of Thailand Forum (CDCOT), Centre National De Recherche Agronomique (CNRA), Bioversity International, Indonesian Coconut Coalition, (Kopek Kelapa) Indonesian Farmers Association and Tanzanian Agricultural Research Institute (TARI). Observer Country in attendance was Brunei Darussalam.

The Governments of Marshall Islands and Vietnam were not represented. A total of 75 participants registered for the Session.

Official Opening Ceremony

The inaugural program was graced by the presence of Secretary Dr. William D Dar, Philippines Minister for Agriculture and Acting Secretary, Government of Philippines who inaugurated the Session in presence of the Mr. Gonzalo T. Duque, Administrator of PCA and Hon. Cynthia A. Villar , Senator , the Republic of Philippines with the visiting Ministers, dignitaries and plenipotentiary delegates from the member countries.

Session & Ministerial Meeting

Mr. Gonzalo T. Duque, Administrator of PCA and Hon. Viam Pillay, Assistant Minister of Agriculture, Government of Fiji presided as Chair of the Ministerial Meeting. The Session started with the Ministerial Meeting on six specific agenda items which was followed by the presentations and discussions on the other Session agenda items.

The major agenda included the presentations by the International Partners of ICC. Ms Mellissa Wood, General Manager, Research Programs Australian Centre for International Agriculture Research (ACIAR) presented the ten-year program of ACIAR expecting the outcomes which will transfer global benefits to other key coconut regions like Asia and West Africa. The programs are:

a. Implement the new *Global Strategy for Conservation and Use of Coconut Genetic Resources* to future proof the coconut gene pool.

Mr. Uron N. Salum, ICC Executive Director Accompanied Session Chair, Hon. Viam Pillay, Assistant Minister of Agriculture, Government of Fiji

b. Ensure sufficient supply of high-quality coconut planting material suited to new product opportunities and intensified production systems, including new tissue culture technologies.
c. Manage biotic pest threats through improved diagnostic capacity and by developing an Integrated Pest and Disease Management Program with a focus on development of effective biological controls.
d. Develop an economically sustainable and diversified coconut production systems to enable growers to invest in the renewal of the coconut resource by replacing senile coconut palms with new high quality and high yield varieties to support a growing processing industry and optimising land use to support economic returns.
e. Investigate new products R&D, such as coco wood veneer industry development including installation of processing capacity, product development, market and value chain. Attract investment capital from partnership with equipment manufacturers and plywood makers in China.
f. Build and support the enhancement of networks for global coconut collaboration and improve national capacity for long term coconut research and industry development.

Mr Daniele Manzella, Technical Officer for International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), FAO Rome presented the developing an efficient partnership with ICC since ICC has taken up the coordination and hosting of COGENT and has also expanded its

Ms Mellissa Wood, General Manager, Research Programs , ACIAR

Mr Daniele Manzella, Technical Officer, International Treaty on Plant Genetic Resources for Food & Agriculture, FAO

mandate from regional to global in line with COGENT's scope:

a. liaise with governments hosting COGENT's collections for upgrading the remaining old agreements into agreements under the International Treaty;
b. expand COGENT's network of collections by signing new agreements with interested host countries;
c. continue assisting the host countries where COGENT's collections are under threat by facilitating the mobilizing of the necessary additional resources by partner institutions and donors;
d. expand technical cooperation for the management of COGENT's collections in accordance with international standards and best practices.

Mr Jan Helsen, Director, Land Development Division, The Pacific Community Suva, Fiji in his presentation mentioned that the Pacific Coominty

Dr Fabian Dayrit, Chair of ICC Scientific Advisory Committee on Nutrition & Health

Dr. Ponciano A. Batugal, Chairman, ICC Technical Working Group

partly in the context of its recently signed MoU with ICC, SPC recommends actions to safeguard coconuts from possible extinction, including collaboration to combat pests and diseases, palm senility and low productivity, and genetic erosion. SPC recommends stronger alliances between investment and development partners recognizing the importance of the 'Tree of Life' that has traditional, food security, and huge underexploited and competitive market potentials. Together the SPC, the ICC and other partners can successfully address the multiple challenges within the region and beyond.

Dr Fabian Dayrit, Chair of ICC Scientific Advisory Committee on Nutrition & Health in his report presented the Terms of References of the committee; activities and proposed the research projects namely: 1. Nutrition and Health Survey; 2. On the effectivity of VCO as cure for AIDS; and 3. On the use of VCO for cognitive health and Alzheimer's Disease and submitted the following recommendations:

a. Follow up the discussion on health issues regarding coconut oil with FAO & WHO.
b. Expand the membership of the SACH
c. Appoint an Editor and International Editorial Board which will be tasked to upgrade CORD into a scopus listed journal.
d. Each ICC member country should strengthen links with their respective Health Ministry.

Dr. Ponciano A. Batugal, Chairman, ICC Technical Working Group presented the recommendations of the ICC Review Committee meetings and Technical Working Group meetings before the Session.

Government of Guyana as new member of the International Coconut Community:

Government of Guyana was unanimously approved as the 20th full member country of the Community.

New Accredited Organizations

The Secretariat nominated 12 organizations which qualified for accreditation with whom ICC has formalized relationship through an MoU. The accreditation enables the organization formal recognition as an Official Observer at all Sessions & Ministerial Meetings and events it provides one member of the organization free registration at International COCOTECH Conferences and other benefits such as the recipient of regular publications, communications, notices and invitations to all ICC related events. The partner relations enable the Community to expand productive activities, visibility and serves its stakeholders in a cost-effective manner.

The organizations includes:(a) Australian Centre for International Agriculture Research (ACIAR); (b) The Pacific Community (SPC); (c) Centre for Agriculture and Bioscience International (CABI); (d) Melanesian Spearhead Group (MSG); (e) Bioversity International; (f) Centre de Cooperation International en Recherche Agronomique pour le Development (CIRAD); (g) Centro de Investigacion Cientifica de Yucatan (CICY); (h) Caribbean Agriculture Research & Development Institute (CARDI); (i) Kopek Kelapa-Coconut Coalition of Indonesia; (j) United Coconut Association of the Philippines Inc; (k) Conservation & Development of Coconut Oil of Thailand Forum(CDCOT); and (l) Consortium of Coconut Farmer Producer Companies, India.








BIOVERSITY INTERNATIONAL | *MSG VANUATU* | *CABI MALAYSIA* | *CICY MEXICO* | *CIRAD FRANCE* | *CARICOM TRINIDAD* | *CDCOT THAILAND* | *UNCTAD GENEVA*

PRESENTATIONS BY REPRESENTATIVES OFOBSERVER ORGANIZATIONS

Country Papers - Gateway for Exchanging Ideas and Programs

Country paper presentation by member countries gave a brief update on the policies and programs for coconut development undertaken by National Governments including the legislations to promote the development of the sector. The delegates presented the status of coconut production, processing and export in their countries. Presented the updates on the coconut replanting, new planting and rehabilitation programs.

The status of the research and development activities , policies and programs implemented in the country to enhance farm productivity and increase the farmers income were also shared with the member country delegates. The constraints faced by the sector and suggested road map for the way forward for the coconut sector were briefed by the delegates. The country papers helped in understanding the developmental activities undertaken by the countries and helps to idnetify the replicable models for customised implementation in other countries. It also helped in exchange of ideas and technology and paved way for possible collaborations between member countries.

Observer Country of Brunei Darussalam also presented a brief update on the policies and programs for coconut development undertaken by National Governments and link with ICC including the legislations to promote the development of the sector.

Observer Organizations

The International organisations attended and presented the nature and extent of their involvement in the Coconut sector with refrence to collaboration with community are Bioversity International; Centre de Investigaticion Cientifica de Yucatan (CICY); French Agricultural Research Centre for International Development (CIRAD); CAB International (CABI) ; Caribbean Community (CARICOM); United Nations Conference on Trade and Development (UNCTAD); Conservation and Development of Coconut Oil of Thailand Forum (CDCOT) and Melanesian Spearhead Group (MSG).

Strategic Plan 2020 – 2024

The Strategic Plan for 2020-2024 approved for implementation by the Secretariat including review by the Technical Working Group after 2.5 years of implementation.

Amendments to the Establishment Documents

Amendments of Establishment documents of ICC approved included *Agreement Establishing the International Coconut Community*; *Agreement between Government of Indonesia and the International Coconut Community*; *Rules of Procedures of the International Coconut Community*; *Financial Regulations of the International Coconut Community* and *Staff Rules and Regulations of the International Coconut Community*.

International COCOTECH Conference

Theme and Venue for the 49th International COCOTECH Conference was approved by the Session. The proposed theme of the Conference is "*Promoting Smart Farming and Eco-Friendly Technologies for Sustainable Coconut Development"* and the Conference during 2020 would be hosted by Government of Malaysia.

Election of New Executive Director

The new Executive Director was elected successfully with 17 members present voting 15 votes to 2 in favor of Dr Jelfina C. Alouw of Indonesia who would assume office effective 22 January 2020.

Field Visit

The delegates were taken on a field visit to the Philippines Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) and University of Philippines (UPLB) at Los Banos. The delegates had an interaction with the experts of the Institute and to know the different activities taken up by the Institutes. The interaction would surly help the delegates to take up collaborative activities with the institutes by their host country.

DOES LOW CHOLESTROL CAUSE ALZHEIMER'S?

Dr. Bruce Fife
Certified Nutritionist and Doctor of Naturopathic Medicine, USA

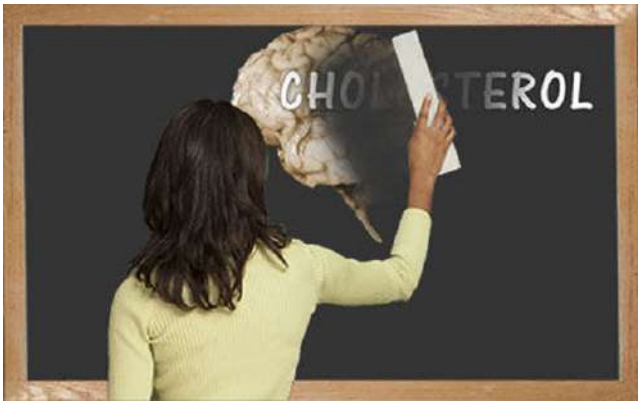
Alzheimer's disease is growing into an epidemic. Over 5 million Americans have the disease. In 1980 Alzheimer's affected less than 0.3 people for every 100,000 in the US. By 2006 that number shot up to 20 per 100,000. The number of cases is expected to double over the next couple of decades. This sharp rise in Alzheimer's is worrying doctors and researchers. "Alzheimer's is going to swamp the health care system," says Dr. John C. Morris, a neurology professor at Washington University in St. Louis and an adviser to the Alzheimer's Association. "It's frightening," says Rachel A. Whitmer, PhD, an Alzheimer's research scientist at Kaiser Permanente in Oakland, California. Currently, Alzheimer's is the seventh leading cause of death in the US.

Alzheimer's usually strikes after the age of 60. Yet, it can occur as early as the 40s and 50s. Over half a million Americans under the age of 60 have Alzheimer's. While the risk of Alzheimer's increases with age, it is not a part of the normal aging process. It is a disease. The brains of Alzheimer's patients are distinctly different from the brains of those people who age normally.

There is no known cure. Doctors don't even know what causes it. However, the sharp rise in Alzheimer's over the past few decades points to something in the environment as the culprit. The disease is more prominent in affluent nations than in poorer countries, suggesting the cause is associated with our changing lifestyle. Diet and health care readily come to mind. Both have changed dramatically over the past few decades.

One of the biggest changes is the shift from eating foods rich in saturated fat and cholesterol to low-fat, and low-cholesterol foods. Since the 1970s we have been in a low-fat craze. Saturated fat and cholesterol have been purged from the diet. We've switched from eating whole foods rich in natural fats, to low-fat and non-fat milks and cheeses, lean cuts of meat, yolkless eggs, skinless chicken, and low-fat this and no-cholesterol that. Even restaurants offer low-fat food options. Total fat consumption has dropped from about 40 percent of total calories in the 1960s to about 30 percent now. Dietary fat has been demonized so severely that out of fear many people restrict their total fat intake to less than 20 percent. Some avoid any and all foods containing the least bit of cholesterol. As a result, we have become a fat deficient society.

What has been the result? Obesity is at an all time high. Over 60 percent of Americans are overweight and one-third of the population is obese. While saturated fat and cholesterol intake have dropped dramatically, heart disease is still our number one killer. Other diseases such as diabetes and Alzheimer's are on the rise. Low-fat, low-cholesterol diets are not working.



It is interesting that as we have moved away from eating fat and cholesterol, the incidence of Alzheimer's has skyrocketed. Is there a connection?

Fat is an essential element of the human brain. Sixty percent of the brain consists of fat and cholesterol. While the brain accounts for only 2 percent of the mass of the body, it contains almost 25 percent of the body's cholesterol.[1]

Although cholesterol has been demonized by the pharmaceutical industry, in truth it is vital for good health and for life itself. Cholesterol performs many vital functions in the body. It is needed to maintain healthy cell membranes, to form hormones (such as estrogen and testosterone), produce vitamin D, and make bile acids, which are necessary for proper fat digestion and nutrient absorption.

The cells of our body are encased in a lipid (fat and cholesterol) membrane. Even the individual organelles (cell organs) inside the cells are encased in a lipid coat. Cholesterol is a vital element of the

cell and organelle membranes. Cholesterol is uniquely able to influence the structure, thickness, permeability, deformation, and other characteristics of the cell membranes. Cholesterol is needed to regulate the entry and exit of certain hormones, fats, and proteins. Cholesterol typically makes up about 20 percent of the membrane. Nerve cells and especially the neurons or brain cells, may contain two or three times this amount.

Cholesterol is constantly being formed to maintain, replace, and repair the cells and tissues, especially in the brain. Cholesterol is absolutely essential for the transmission of nerve impulses and for the storing and retrieving of memories. The synapses—the highly specialized junctions between the brain cells—depend on cholesterol in order to transmit signals from one neuron to another.[2] Any interference with normal cholesterol synthesis can impair nerve tissue maintenance and repair, leading to neuron degeneration.[3] Even a small depletion of cholesterol—less than 10 percent—has been shown to be enough to inhibit nerve transmission.[4] When this happens memory and cognitive skills decline.[5]

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A dementia were assessed. Higher cholesterol was associated with higher memory scores on tests. The researchers' conclusion: "high cholesterol is associated with better memory function."[8]

Researchers at Seoul National University in South Korea came to similar conclusions. For three years they followed 106 elderly subjects with possible dementia. As with the other studies, those with the highest cholesterol readings performed the best on neuropsychologic tests. Those who eventually digressed into Alzheimer's disease had lower blood cholesterol readings.[9]

A number of studies have shown that Alzheimer's patients tend to have lower total blood cholesterol, lower HDL cholesterol, lower LDL cholesterol, and lower triglyceride levels than age matched people with normal mental function.[10-11] Brain cholesterol levels are also below normal. An examination of brain tissues from deceased Alzheimer's patients shows that the areas of the brain associated with memory are cholesterol deficient.[12-13]

As far back as 1991, researchers suggested that increasing delivery of cholesterol to the brain may help Alzheimer's patients and recommended increasing fat consumption.[14] More recently, a study published in the Journal of Biological Chemistry showed that dietary cholesterol, the type found in foods such as eggs and meat, can protect the brain from the physiological changes that are associated with Alzheimer's disease. This study provided evidence that dietary cholesterol improves brain cholesterol status and helps protect against the formation of amyloid plaque, a feature found in the brains of Alzheimer's sufferers.[15] This study demonstrated that dietary measures can be taken to help protect against developing neurodegenerative disease. It also suggests that the wrong type of diet (i.e., low-fat, low-cholesterol) can promote neurodegeneration.

Cholesterol levels, for the most part, are set by genetics. Some people naturally have what is generally considered to be low cholesterol, while others have higher cholesterol. Higher cholesterol isn't bad if it is the level that has been set by your genetic blueprint and is not a consequence of some rare inherited defect or illness. Forcing your cholesterol level down with drugs will only cause problems. Reducing cholesterol by extreme low-fat dieting or drug therapy is known to cause changes in the brain similar to those found in Alzheimer's patients.[16]

When blood cholesterol is lowered by any means, cognitive ability declines, increasing the risk of

Alzheimer's. The adverse effects of cholesterol-lowering statin drugs on brain health have been reported for years.[17-19]

Not everyone who takes statins complains of memory loss. However, everyone who uses statins is adversely affected to some degree. This was demonstrated by researchers at the University of Pittsburgh School of Medicine. The investigators took 209 healthy adults and randomly split them into two groups, one being the treatment group and the other the control group. The treatment group was placed on statins and the control group on placebos. At the beginning of the study cognitive performance and psychological well-being of each participant was carefully assessed. After six months, all of the patients on placebos showed a measurable increase in cognitive function, while every subject in the statin group showed a measurable decrease in cognitive function in one or more areas.[20] So apparently, everyone who takes cholesterol-lowering drugs is adversely affected to some degree. Researchers have also found that depriving the brain of cholesterol sets into motion chemical changes that lead to the formation of abnormal proteins and neurofibrillatory tangles which are characteristic of the damage seen in Alzheimer's and other neurodegenerative diseases.[21]

> ***…every subject in the statin group showed a measurable decrease in cognitive function…***

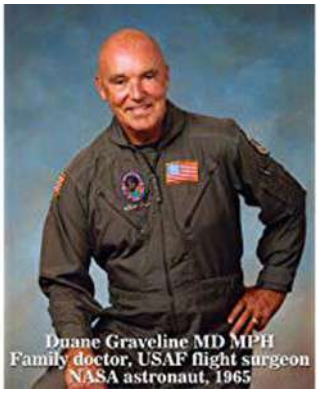
Ironically, drug companies have tried to portray high cholesterol as a cause of Alzheimer's and have touted statins as a novel means to lower the risk of the disease. One pharmaceutical industry sponsored study reported that people who have high cholesterol in their 40s appear to have an increased risk of Alzheimer's disease decades later.[22] The problem with this study, however, was that most of those people who had high cholesterol and developed Alzheimer's later in life were also taking statins. It was not the cholesterol that was causing the problem but the drugs they were taking to lower the cholesterol. Those people who naturally had lower cholesterol and were not on the drugs were less likely to develop dementia. The drug industry points to this study as another reason why people should be taking cholesterol-lowering drugs.

In a couple of short term studies cholesterol-lowering drugs have appeared to slow down the cognitive decline of individuals with Alzheimer's. The pharmaceutical industry has used these studies to justify their stance that statins protect against Alzheimer's. But again the studies are misleading. In the short run statins may provide some benefit but over time they accelerate the rate of cognitive decline, making the condition worse.

For example, in one study with elderly African Americans, researchers stated that "Initial use of statins resulted in less cognitive decline in individuals, but continued use of a statin resulted in more cognitive decline."[23] It is believed that the initial improvement was due to the anti-inflammatory effect of the drug, which may have helped reduce chronic brain inflammation—a characteristic of Alzheimer's. But in the long run the damaging effects of cholesterol depletion overshadowed this positive effect. A study like this can be made to appear to support statins if the long term effects are ignored. This doesn't stop the drug companies from pointing to the short term effects as proof that we need to add drugs to our diet.

> ***Autopsy studies…have shown no protective benefit whatsoever in taking statins.***

More recent studies, however, have completely refuted the drug makers' claims. They have demonstrated that statins provide absolutely no protection against Alzheimer's disease or dementia in general.[24] Autopsy studies—the most definitive in regards to the changes occurring in the brain—have shown no protective benefit whatsoever in taking statins.[25] Unfortunately, drug companies continue to promote and perpetuate these falsehoods.



Perhaps the most vocal advocate for educating people about the dangers of statins on brain health was Duane Graveline, MD, MPH. His passion stemed from his own experience using these drugs. Dr. Graveline was a former United States Air Force Flight Surgeon and Astronaut.

As a NASA astronaut he was required to be in tip-top shape both mentally and physically. During a routine medical exam, Graveline was told his cholesterol was too high, so he began taking 10 mg of Lipitor daily. Six weeks later he began to lose his memory.

One day Graveline seemed fine, but then his wife spotted him walking aimlessly about their driveway

and yard. When she confronted him, he acted confused and gave no evidence of recognizing her. He refused to come into the house or get into the car to see the doctor. She had to call an old friend of his to convince him to go see the doctor. A neurological examination that included an MRI found no abnormalities.

He remembers nothing of this incident. About six hours after his wife first noticed his condition be slowly began to come to his senses. He was completely bewildered by the experience. Over the next few days his mind began to function normally again. He questioned neighbors and asked them if they saw him walking about on that day. One of them said he saw Graveline walk past his house and that he stopped to talk to another neighbor for a few minutes. Graveline had no memory of it.

During this recovery period he had neglected to take the medication. He experienced no further memory problems. He began to wonder whether the cholesterol medication was at the bottom of all it all. In researching statin side effects he found only slight references to possible cognitive problems. He questioned several doctors and pharmacists if Lipitor could cause memory loss. They all assured him it didn't. He was not so sure.

A year later at his next astronaut physical, he was again advised to take cholesterol-lowering medication. When he expressed concern about the drug's effect on his memory the doctor replied, "Statins don't do that." The doctor convinced him to get back on the drug but reduced his dose to only 5 mg a day. Six weeks later he experienced a second episode of amnesia, this time more severe than the first. He lost all memory of his wife and children, his career as an astronaut, his medical school training, and his college life. He could recall his early teenage years and before, but nothing of his entire adult life. He remained in this stupor for 12 hours.

Again the examining doctors chorused "Statins don't do that" but he was convinced they do. No one seemed to believe him. Desperate to find out more about the connection between statins and memory loss, he sent an email describing his problem to the People's Pharmacy, a newspaper column that is syndicated throughout the country. His letter was printed in the column. The authors of the column were immediately bombarded with hundreds of letters from readers reporting similar experiences. After receiving hundreds of reports similar to these and uncovering studies linking cognitive problems with statin use, Dr. Graveline wrote a book titled titled statins.

Cholesterol is an important building block for our cells, particularly for our nerve and brain cells. If you are going to build a brick house, you will need an ample supply of bricks and mortar for the job. If the supply company delivers only half the bricks needed, your house cannot be completed and will not function as designed. The same is true with your brain. When you reduce your cholesterol with extreme dieting or drugs, the brain is deprived of the building blocks it needs to function properly.

If you want your brain to be healthy, you should make sure to get plenty of good fats in your diet and eat good sources of cholesterol such as organic meats, poultry, fish, dairy, and eggs. The best fats are traditional fats that have been used safely for thousands of years by cultures around the world. These foods provide the basic building blocks the body needs to manufacture and maintain proper cholesterol levels. If you eat healthy natural foods you do not have to worry about your cholesterol.

Good cholesterol foods

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1ST NATIONAL COCONUT FESTIVAL OF PAPUA NEW GUINEA

Muhartoyo
ICC Documentalist
International Coconut Community

Hon. Davis Madava Steven, MP, Deputy Prime Minister and Minister for Justice & Attorney-General, flanked by Hon. Sam Basil, Minister for Planning & Monitoring (left) and Mr. Alan Aku, KIK Acting Managing Director Proceeding to Innaugural Stage.

The Kokonas Indastri Koporesen (KIK) successfully organized the country's first coconut festival from 26-28 September 2019 at the Sir John Guise Stadium in Port Moresby. The purpose of the Coconut Festival was to provide opportunity to showcase the potential of coconut industry of the Papua New Guinea. it was also aimed to promote the benefits of coconut so that people who look after and continue to source their livelihood from coconut have better income opportunity.

The coconut festival runs under the theme 'Coconut for family wellness' in reflection of an international theme that is being promoted by the International Coconut Community (ICC) formerly known as Asian and Pacific Coconut Community (APCC) which PNG is a member too.

Activities covered seminar presentations on selected subjects on nutritional and health benefits of coconut, processing of some valued added coconut products and development aspects of coconut, exhibitions of high value coconut products, information on coconut processing equipment and machinery, technical knowledge and information including demonstration of virgin coconut oil processing and soap production.

Hon. Davis Madava Steven, MP,Deputy Prime Minister and Minister for Justice & Attorney –General Giving His Keynote Address

The KIK acting Managing Director, Alan Aku, said coconut is 500 million industry, a big industry

The Panelists of Seminar Day 1, From left, Dr. Fabian Dayrit from Philippine, Dr. Eric Omuru, Moderator, Mr. Anas A. Setiawan from Indonesia, and Mr. Sasi Khumar from India

A Seminar Participant Raising Questions during the Q & A Session

which cannot be played down anymore. A new era of coconut industry begins by the introduction of a paradigm shift in which downstream processing to produce various value added products is strongly encouraged. This Coconut Festival is part of the this shift.

KIK has embarked on Small and Medium Enterprises (SMEs) program which is focused on small people in the value chain. They need to be developed in order that people on the ground will benefit from the coconut industry development. Not less than 16 small to medium enterprises (SMEs) involved in the industry showcased their products. Currently Sixteen SME's are in the business of creating coconut products which ranges from body dress and decorations, housing, fuel, oil for cooking, beverages, cosmetics, biofuels, soaps, lotions, shampoos among many others

At the inaugural session Mr. Uron N. Salum, Executive Director of International Coconut Community gave an overview of the Coconut Industry around the World. Meanwhile Minister for National Planning and Monitoring: Hon. Sam Basil, MP, in his inaugural speech said that the

A View of the Exhibition

Hon. Davis Madaya Steven, Deputy Prime Minister and Minister for Justice and Attorney-General (Second from left) visiting ICC booth.

Some Coconut Products which have not been produced in PNG at the ICC Stall Attracting Many Visitors of the Festival.

Government is now focusing on growing the economic sector and has fully pledged to support the coconut industry seeing the industry as a dynamic and lucrative industry which generates adequate revenue for the nation's economic growth.

Papua New Guinea's Deputy Prime Minister, Hon. Davis Steven who gave keynote address during the inaugural session says that the Coconut Industry is the missing link which will boost the country's economy.

In this occasion, International Coconut Community also actively participated in the exhibition by showcasing various high value coconut products such as shoes and slippers made from coir, coconut sugar, nata de coco, coconut water and coconut milk in tetrapak packaging, virgin coconut oil, and coconut chips. Many visitors were curious to find out these products. Special attention was given by the visitors to the products which have not been produced in Papua New Guinea yet such as, coconut sugar, coir handicrafts, shoes and slippers. These products become eye opener for them to realize that coconut can be processed into many value added products and can potentially increase the income of coconut farmers.

To inculcate the love of coconut from childhood, various fun games were organized during the festival. The games include: coconut bowling, coconut coin toss, Pin the coconut on the tree, coconut head dress up, hidden prizes under the coconut. Many children were quite enthusiastic in taking part in these amusing games.

DEVASTATION OF COCONUT BY 'GAJA' CYCLONE AND STRATEGIES FOR REBUILDING OF COCONUT FARMING IN TAMIL NADU STATE, INDIA

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Introduction:

Natural disaster 'Gaja' cyclone crossed over the state Tamil Nadu in India during the late night hours of 15th November and early morning hours of 16th November 2018 caused heavy damage to Agriculture, livestock and human lives.

The 'Gaja' cyclone crossed over the land near Vedaranyam of Nagapattinam district in the east coast region of Tamil Nadu with a high speed wind exceeding 120 kmph. It also caused heavy loss to the houses and infrastructures. The cyclone devastated the crops particularly coconut palm in

Fig. 1: India map (State wise)

Cauvery delta districts of Tamil Nadu *viz.,* Thanjavur, Pudukkottai, Nagapattinam, Tiruvarur and Tiruchirappalli districts which are adjacent to the east coast region of the state.

Coconut is the predominant crop grown as plantation as well as oilseed crop in the east coast region of the state. Coconut is extensively cultivated in this delta region for the last 40-50 years by replacing the traditional rice crop. The annual rainfall is ranging from 1000-1200 mm. The soil type is clay loam and sandy alluvial type in nature. Coconut is grown under irrigated and rainfed condition.

Most of the farmers are small and marginal farmers with coconut garden of less than two

Fig. 2: Tamil Nadu map (cyclone affected districts)

hectares. In addition to loss in coconut production, the cyclone has caused unemployment, environmental pollution and changes in the pest and disease scenario. The cyclone significantly affected the rural economy and social status of the farmers in this region.

Status of coconut cultivation in India:

Tamil Nadu is one of the major coconut growing states in the country ranking third place in coconut area (0.461million hectare) and production (6571 million nuts) contributing 22.1 % and 27.5 % respectively.

Table 1: Area, Production and Productivity of major coconut growing states in India (2016-17)

States	Area ('000 hectares)	% share in area	Production (million nuts)	% share in production	Productivity (nuts/ ha)	Productivity (nuts / tree/ year)
Kerala	771	37.0	7449	31.2	9664	55
Karnataka	514	24.7	6773	28.3	13181	75
Tamil Nadu	461	22.1	6571	27.5	14251	81
Andhra Pradesh	115	5.5	1378	5.8	11957	68
All India	2082	-	23904	-	11481	65

Source: Coconut Development Board, Kochi (2018)

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States	Area ('000 hectares)	% share in area	Production (million nuts)	% share in production	Productivity (nuts/ha)	Productivity (nuts / tree/ year)
Kerala	771	37.0	7449	31.2	9664	55
Karnataka	514	24.7	6773	28.3	13181	75
Tamil Nadu	461	22.1	6571	27.5	14251	81
Andhra Pradesh	115	5.5	1378	5.8	11957	68
All India	2082	-	23904	-	11481	65

Source: Coconut Development Board, Kochi (2018)

Table 2: Area, production and productivity in the Gaja affected region of Tamil Nadu (2016-17)

Name of the district	Coconut area (ha)	Production (million nuts)	Productivity (nuts/ha)	Productivity (nuts / tree/year)
Thanjavur	36136	663.9	18372	105
Tiruvarur	4718	87.0	18440	105
Pudukkottai	9456	112.1	11855	68
Nagapattinam	3823	65.4	17104	98
Tiruchirappalli	6070	46.5	7661	44
Dindigul	30538	241.6	7911	45
Average Production	-	-	13557	78

Source: Coconut Development Board, Kochi (2018)

Tamil Nadu ranks first in coconut productivity in India with 14251 nuts / hectare as compared to the national average of 11481nuts / hectare.

A total area of 41492 hectares out of 54133 hectares was completely devastated by 'Gaja' cyclone accounting to 76.64 % in the above four districts. Thanjavur district was severely affected by the cyclone with an area of 32544 hectares and followed by 32541 hectares in Pudukkottai district. The cyclone damage was very meagre in Tiruchirappalli and Dindigul districts. In the affected coconut gardens mostly 70-80 % of coconut palms were completely damaged or uprooted.

General observations made:

Adult coconut palms at different ages (5-70 years) were heavily affected and young coconut trees of 2

Table 3: Coconut area devastated by Gaja cyclone in delta districts of Tamil Nadu

Districts	Total area (ha)	Cyclone affected area (ha)	% of area affected
Thanjavur	36136	32544	90.05
Pudukkottai	9456	3541	37.44
Tiruvarur	4718	3081	65.30
Nagapattinam	3823	2326	60.84
Total	54133	41492	76.64

Source: Department of Agriculture, Govt. of Tamil Nadu (2018)

3 years were slanted or twisted due to the cyclone. Coconut trees which were shallow planted at a depth of 1-1½ feet were completely uprooted due to the cyclone. Both tall varieties (East Coast Tall, West Coast Tall) and hybrids (Tall x Dwarf, Dwarf x Tall) were affected. Coconut palms with heavy yielding under irrigated condition were completely damaged by the cyclone. Tall coconut varieties of more than 40 years old grown under rainfed condition were relatively less affected by the cyclone. Apart from this, thousands of coconut palms are surviving with partial damage. Coconut trees planted in field bunds, border planting as single or double rows were less affected. Coconut palms planted in closer spacing of less than 25 x 25 feet were severely affected.

Plate 1: 'Gaja' cyclone affected coconut garden

Types of cyclone damage on coconut

The cyclone caused extensive damage to both juvenile coconut palms of less than five years old and adult coconut palms upto 70 years old. Nature of damage to coconut palms is grouped as two categories *viz*., 1.Complete damage to coconut palms which cannot be recovered and 2. Partial damage to coconut palms which can be rejuvenated / revived.

1. Complete damage

- **Breakage at bole region:** Palms that are exposed in the bole region with shallow planting and inappropriate earthing up were broken off at the collar region and were completely detached from the root system. Tissues of trunk portion were completely damaged and roots were also cut in these palms
- **Trunk breakage:** In the affected gardens, many of the palms were also broken at the trunk region which were constricted by moisture stress during earlier years or at weakened spots due to damage by pests and diseases such as red palm weevil, rhinoceros beetle damage, basal stem rot and stem bleeding diseases. Heavy yielded coconut palms even with appropriate planting were broken in the middle of the trunk due to high speed wind.
- **Uprooting of palms:** Due to the heavy wind velocity (120-140 kmph) of the cyclonic storm, the palms along the windward side had been completely uprooted at the base which cannot be revived. The uprooted palms were fallen on the ground. Complete uprooting was noticed in coconut gardens where ever improper planting and excessive irrigation were followed.
- **Removal or blown away of crown region:** The crown region of certain affected palms was completely blown away by the high velocity wind. The crown of affected palm remains as decapitated palm without further growth.

Plate 3: Trunk Breakage

2. Partial damage

- **Slanting of trunk portion:** The cyclone affected coconut palms were slanted in different angles. In some trees, partial exposure of roots above the ground level was also noticed.
- **Crown twisting of palms:** The crown had been twisted in the juvenile and adult palms with reduced crown weight depending upon the wind direction.
- **Breaking and shedding of leaves:** In the crown of affected palms, bruising of
- leaves, petiole breakage, spindle leaf breakage to severe tearing of leaves, various levels of defoliation were also observed.
- **Shedding of mature and immature nuts :** Complete shedding of buttons, immature and mature nuts was observed in the affected garden.

Issues after cyclone damage

- **Livelihood of small and marginal farmers is significantly affected**: Most of the farmers in this region are small and marginal farmers having the farm holdings of one to two hectares. They are completely depending on the coconut farming for their basic livelihood, children education etc. The cyclone completely washed away their source of income which will influence on their social status also.
- **Coconut based industries are affected:** As the supply of raw material is significantly reduced, coconut based industries like coconut oil mills, coir industries, production of coconut desiccated powder and coir pith briquette are very much affected and become non viable.
- **Created unemployment to agricultural labourers** : Due to the cyclone, skilled and unskilled agricultural labourers engaged in various operations of coconut farming lost their regular jobs and income.
- **Removal and disposal of broken, uprooted palms:** Removal and safer disposal of fallen crown, trunk portion, bole region from the affected coconut garden is a great task to the farmers. It involves more cost, labour and machineries. There is a limited scope for using fallen coconut trees as timber. Mostly coconut trunk is used as fire wood in 'Brick" making industries with less economical value. Recycling or decomposing the fallen coconut trees as organic manure will be a practical and ideal solution for the disposal of uprooted trees. Leaves, petioles and inflorescence in the crown of affected palms can be powdered by using mechanical Leaf Shredders. In between the two rows of coconut garden, trenches can be made at 20-30 feet length, 10 feet width and 5-6 feet depth. Coconut trunks, crown and boles are put in to the trenches and applied with bio agents like *Trichoderma* and *Pleurotus* and covered with soil for decomposition. It will serve as good source of organic manure to the palms in due course.
- **Non-availability of quality planting material for new planting:** Since thousands of coconut trees are uprooted at a time, quality planting material are not available to the farmers for replacement. Particularly there is a heavy demand for hybrid seedlings
- **Revival / Establishment of surviving trees :** The recommended package of practices like

Irrigation management, integrated nutrient management and integrated pest management should be adopted for the recovery of partially affected trees. A minimum period two years period is required for the regular bearing of affected trees.

- **Changes in pests and diseases status in coconut:** After the cyclone, infestation of two major pests of coconut palms *viz*., rhinoceros beetle (*Oryctes rhinoceros)* and red palm weevil (*Rhynchophorus ferrugineus)* may increase due to the available food source in the region mainly the trunk and crown of fallen trees. Due to the mechanical injury by the cyclone, intensity and spread of bud rot (*Phytophthora palmivora*), basal stem rot (*Ganoderma lucidum)* and stem bleeding (*Thielaviopsis paradoxa*) diseases are to be increased.

Package for rejuvenation of coconut trees affected by Gaja cyclone

Tamil Nadu Agricultural University has given the following recommendations for the revival of cyclone affected surviving coconut palms.

1. Coconut seedlings of 1 to 3 years age affected by cyclone which are free from damage and are in a slanting position, they can be restored to original position by providing with support.
2. Proper irrigation to affected palms through basin method of application or micro irrigation is highly essential for the recovery of palms. Excessive irrigation or flood irrigation should be avoided. A quantity of 60-80 litres of water per palm per day is required for adult coconut palms of more than 5 years old. Soil moisture conservation with mulching techniques can be followed.
3. The Integrated nutrient management (INM) package involving application of organic manures viz., 50 kg Farm Yard Manure, 5 kg neem cake, inorganic fertilizers *viz*., 1.3 kg Urea, 2.0 kg Super phosphate, 3.5 kg Muriate of potash, micro nutrients namely 1 kg Gypsum, 0.5 kg Magnesium sulphate, 0.05 kg Borax along with bio agents like 0.1 kg *Trichoderma*, 0.1 kg *Pseudomonas* and 0.005 kg VAM per tree is recommended for trees of 5 years age and above in two splits dose at six months interval. First split dose is given one month after restoration.
4. The cyclone has disturbed the physiological and metabolic activities of the trees and affecting their normal growth and yield. The palms which are apparently healthy with minimum damage can be rejuvenated by root feeding with TNAU coconut micronutrient tonic @ 200 ml/palm once in six months. It should be given for two years continuously.
5. Any one of the green manure crops namely, sunhemp, calapagonium, kolingi or daincha may be raised and ploughed *in situ* at the time of flowering to enrich the soil.
6. Affected tissues in the coconut trees with bleeding patches may be scrapped out and applied with Bordeaux paste or Copper oxy chloride to prevent fungal infections like *Thielaviopsis*. The cyclone caused breaking and injury of terminal bud, spindle leaf and other leaves in the crown which will encourage bud rot infection. Spraying of copper oxy chloride @3 gm in one litre of water in the crown will reduce the disease incidence.
7. In order to control basal stem rot disease (oozing of brownish fluid from basal portion of trunk), root feeding with 2 ml Hexaconozole in 100 ml of water three times at three months

Plate 4: Crown twisting of palms

Plate 5: Crown twisting of palms

Plate 6: Slanting of Coconut Tree

interval may be adopted. Bordeaux mixture 1% may be applied @ 40 litres per palm once in a year to reduce the population of pathogen in the soil.

8. Good sanitation may be maintained by removing dead coconut trees in the garden. It will be helpful to reduce the pest population. Leaf axil placement of naphthalene balls @ 12 g / tree or chlorantraniliprole 0.4 GR @ 6 g / tree + 20 g sand /tree to repel the adult rhinoceros beetle. Neem seed kernel powder 50 g along with 100 g sand may also be applied. Monitoring and mass trapping of adult red palm weevil and rhinoceros beetle by installing aggregation pheromone bucket trap @ 1 /hectare.

Recommendations for new planting of coconut

In the completely cyclone devastated gardens, new planting of coconut is recommended as given below.

1. In the coconut gardens completely devasted by Gaja cyclone, new planting is advised with the following coconut varieties East coast tall (ECT), VPM 3 (Selection from Andaman ordinary), VPM 4 (West coast tall), Tall x Tall hybrid VPM 5 (Laccadive Ordinary Tall X Cochin china Tall) and Tall x Dwarf coconut hybrids *viz.,* VHC 2, VHC 3. Hybrids are recommended for the irrigated coconut cultivation.
2. Recommended spacing of 25 x 25 feet and proper planting of seedlings at 3 feet depth in the pit with dimension of 3 x 3 x 3 feet should be followed. Coconut seedlings should be planted in rows in between the existing affected coconut palms.
3. Recommended dose of organic manures viz., 10 kg farm yard manure or green manure and 1 kg of neem cake should be applied at the time of planting
4. During the pre bearing period (upto 5years), short duration crops like groundnut, sesame, pulses, vegetable crops, pine apple, banana, turmeric and flower crops like marigold, chrysanthemum can be raised as intercrops to obtain an interim income in the newly planted coconut garden.

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SUSTAINABLE COCONUT DEVELOPMENT PROGRAMME IN SRI LANKA: SPECIAL PROJECT ON INCREASED IMPROVED SEED NUT PRODUCTION AND HYBRID SEEDLINGS DISTRIBUTION TO HOME GARDENS

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Introduction & Rationale of the project

Coconut is one of the three major plantation crops grown in Sri Lanka covering an extent of 0.44 M hectares in the country, with a present trend in expanding coconut cultivation into non-traditional coconut growing areas specially into the 30 years of war affected Northern province of the country. Coconut is the second staple food crop in Sri Lanka next to rice with a domestic consumption of 70–80% of its annual production, which accounts for about 1800 to 2,000 million nuts with the per capita consumption of approximately 115 nuts per person per year.

This number is expected to increase with the population growth and with present trend in increased use of coconut with the reveal of health benefits of coconuts. For example, during the last 10 years, population has increased in about 3.4 million and accordingly local coconut consumption has increased by 251 million nuts. Coconut is a versatile crop, which provides the basic need of the people, i.e. food, drink, shelter and livelihood in addition to its diverse range of industrial products from kernel, shell, husk and water and from the trunk. Coconut plays a major role as food providing 15% of calories and 5% protein for Sri Lankans.

About 5% of the population in Sri Lanka depends on coconut as the main source of income by providing livelihoods for about 700,000 people directly and indirectly. Coconut is primarily a smallholder crop in Sri Lanka and 75% of the growers are small to medium scale growers. Hence, in Sri Lanka the coconut sector plays a vital role in generating sustainable income for rural and estate sector communities. Further to its importance to the local community, coconut sector plays an important role in bringing much needed foreign revenue to the country by exporting mainly its value-added products such as desiccated coconut, coconut oil, coir and activated carbon. For example, the foreign exchange earned from export of coconut products in 2011 was US$ 346.0 million and it contributed 1.1% to the GDP.

Coconut industry in Sri Lanka is currently facing many challengers. The limiting number of coconuts as fresh nuts or nut equivalent of its value-added products for the foreign market is one of the present challengers in the present-day coconut industry in a situation where higher proportion of coconut (70% to 80% of the production) is consumed domestically. For example, although 600 to 800 million coconut are exported as coconut kernel products, an expenditure of about Rs. 16 billion is annually spend on import of Palm oil and other vegetable oils to the country to cover the balance requirement of edible oil requirement of Sri Lankans. Coconut oil is the main source of vegetable oil used in Sri Lanka.

On an annual average only 78,000 metric tons coconut oil is domestically produced when the actual requirement of edible oil of the country ranges from 130,000 – 150,000 metric tons annually. The total requirement of the coconut industry in Sri Lanka is around 3800 million nuts per annum, but the total production is almost stagnated between 2500 and 2900 million in the past ten years. The solution for the challenge of increasing coconut production to meet the demand for local consumption and the requirement for foreign market lies in the mission of increased productivity from existing lands while exploring expansion of coconut cultivation into the non-traditional areas.

Productivity increase lies in the hands of plant breeders and agronomist as genetically superior planting materials giving high yield and adapting to diverse environments will provide the foundation for productivity increase with proper agronomic follow up. For example, the hybrids coconuts cultivars in Sri Lanka are capable of producing 40-50% more yield than traditional cultivars when judiciously planted and cared for.

Currently the supply of genetically superior seed nuts supplied by the seed gardens is limited to 30% of the total seed nut requirement. The balance

requirement is taken from selected coconut palm (Plus Palms) from good estates which is a poor substitution. The project activities covered the Ambakelle Isolated Seed Garden (ISG) and the Pallama Seed Garden (PSG) at Pallama in the Puttalam District, the Maduru Oya Seed Garden (MOSG) in Bogaswewa in the Polonnaruwa district, the Kiniyama Seed Garden in Bingiriya in the Kurunagala district and in the entire coconut growing area in the in the Northern Province.

Project objectives

A three year project was commenced at the Coconut Research Institute (CRI) of Sri Lanka in 2017, for the period of 2017 to 2019 with the special funding from the treasury as an special project for coconut development as a result of a project proposal submitted by CRI to the treasury through the Ministry of Plantation Industries.

The project aimed at increased improved seed nut production from its three seed gardens for production of genetically superior high yielding coconut planting materials to meet the total demand of the coconut growers which is estimated to be around 4 million seedlings per year to achieve the highest coconut productivity. In addition, the project launched a massive hand pollination programme as a supplementary to the seed gardens to produce minimum of 100,000 hybrid seed nuts within the project period to produce seedlings and distribute two seedlings each to each family among home gardens in the war affected Northern province.

Specific problems addressed by project

a) *Inadequacy of coconut production to meet the domestic and industrial demand*

In the light of emerging and progressive acceptance of coconut as a healthy food & beverage in the world and considering the increased population growth in coming years, a very high demand for coconuts could be anticipated in future. The currently estimated demand is around 3800 million nuts (around 2000 million nuts for local consumption and 1800 million nuts for the industry). In order to cater to the increasing demand for local consumption and to meet the future international demand for coconut, Sri Lanka need to take effective to ensure that Sri Lanka harvest the maximum potential from available land given the situation that land for coconut cultivation would be a major constraint.

b) *Inadequate availability of genetically superior high yielding coconut hybrids to meet the total demand of the coconut growers*

Prior to 1965, the annual seed nut requirement for the National Replanting Programme (NRP) of Sri Lanka was less than 100,000 nuts per annum and was met by superior mother palm seeds only. But with the growing demand for coconut seed nuts since about 1970, the annual requirement had increased to over 3 to 4 million nuts per annum to date. Furthermore, special projects implemented in recent times, the nuts laid in nurseries exceeded 10 million nuts. CRI has been involving in the process of mass production of improved seeds through seed gardens.

However, the capacity of seed nut production from existing seed gardens did not meet the total seed nut demand and therefore the balance seed nut requirement was met by a pool of scientifically selected palms known as “plus palm” (less stringent selection) and from nuts collected from estates known as “block nuts” (very poor substitute). However, this was never happened as seed production from seed gardens remained static at about 30% of the requirement of the NRP as a result of ever-increasing demand for seed nuts year by year and lowering productivity of palms in the seed gardens due to aging.

Therefore, establishment of new seed gardens, speeding up of work of seed gardens being established, strengthen the capacity of hand pollination progarmmes and rehabilitation and replanting of existing coconut seed gardens have to be carried out in an accelerated phase. Further in order to meet the increasing demand for seed nuts from the growers in the Northern part of the country, plus palms needs to be identified in the area only as transport of seed nuts from other areas to Northern part is costly while measures are taken to reduce the plus palm pool in the other parts of the country.

c) *Non-availability of genetically diverse planting materials for different uses and different environments for judicious use in increasing coconut productivity*

Coconut productivity can be increased through judicious planning of coconut planting taking into consideration the objectives and environment of coconut being planted. The coconut hybrids developed and recommended by CRI are capable of giving about 40 -50% more yield compared to traditional local tall varieties, if they are planted in a good environment and/or carefully looked after. Hybrids planted in home gardens are of such excellent example where household consumption is more than met by just one or two hybrid palms in the home garden.

Table 1: Volume of coconut production, exports & domestic consumption (2008-2013)

Year	Coconut Production (Mn.Nuts)	Export of Kernel Products (Mn. Nuts) (Equivalent)	Domestic consumption (Mn. Nuts)	% of Domestic consumption
2008	2,909	472	2,437	84
2009	2,762	493	2,269	82
2010	2,317	361	1,756	76
2011	2,808	481	2,327	83
2012	2,940	459	2,481	84
2013	2,513	395	2,118	84

Source: CDA Statistics, 2012

Table 2. Number of seed nut supplied to NRP from Seed Gardens (ISG at Ambakelle and MOSG at Maduru Oya) (2010-2013)

Cultivar/Year	2010	2011	2012	2013
CRIC60(Tall) (ISG)	856,225	682,365	749,411	476,070
CRIC60(Tall) (MOSG)	230,521	353,298	357,199	365,878
CRIC65 (Dwarf x Tall) (ISG)	72,556	90,998	57,586	77,256

Moreover, cultivars for less favorable environments (CRIC60, CRISL98) are in high demand in the estate sector due to management related issues, although they are less productive than hybrids. The hybrid with coconut mite tolerance (CRIC65 Yellow form) is of the choice of planting materials for places where mite damage is severe when coupled with Integrated Pest Management strategies. Furthermore, there are varieties which are giving more kernel yield than other cultivars or hybrids which are demanded by estate sector which are selling their nuts on weight basis. King coconut and dwarf varieties are in high demand for coconut water and they are the future varieties in the light of increasing demand for coconut water as a healthy drink in the world.

Therefore, seed production programme should aim at producing seed nuts of divergent cultivars. This is more importantly safe guards the coconut industry being devastated in any likely event of calamities where some cultivars may die due to less biotic or abiotic stress tolerance.

Mode of intervention of this project

a) *Improve and maintain existing seed gardens to the maximum seed production potential by rehabilitation and replanting, establish new seed gardens*

The Isolated seed garden at Ambakelle (ISG) in Puttalam district in North-Eastern province has been established in 1960's and this seed garden is the main source of seeds of improved tall cultivar CRIC60 and the only source of CRIC65 dwarf x tall hybrid seeds. Due to *Aceria* mite damage alone, about 0.3 M CRIC60 seed nuts produced (18%) in the seed garden is discarded owing to deformation of the nuts. There is a predatory mite breeding lab in the seed garden initially established for the purpose of supplying mite parasites to the coconut growers.

Within this project, the infrastructure facility of the excising lab was expanded to increase the predatory mite production sufficient enough to cater to the entire seed garden and bring down the mite population below threshold level. By this way it was expected to increase 0.27 M seed nuts (with estimated 10% nut rejection) of CRIC60 cultivar within a period of one year. The seed garden is established in 1960's and therefore some fields are due for replanting due to aging.

As a result, the seed production potential of the seed garden is in declining trend. The dwarf

Predator mite breeding laboratory at ISG

coconut palm population in the seed garden which is used to produce CRIC65 is highly sensitive to moisture stress during drought months. Hence a reliable high slandered drip irrigation system was established to provide irrigation for all dwarf field with 4500 dwarf green and dwarf yellow at the ISG in order to increase yield of the CRIC65 and get a steady supply of seed throughout the year from them despite frequent droughts with the climate change. Within this project, two deep wells were established. It is also done the improvement to soil by practicing application of organic manure and by introducing proper moisture conservation practices including mulch and individual husk pits. By this way, it was expected to increase CRIC65 seed nut production by 0.025 M maintain a steady supply of seed nuts. With the replanting of the overage tall fields and with improved management (moisture conservation practices and organic manure application) it was expected to regenerate the seed garden within 4 to 5 years of lag period and then increase the production potential by 0.25 M seed nuts per annum.

The seed garden at Maduru Oya (MOSG) in Polonnaruwa district in North-Central province has been established in 1980's and this seed garden is a supplementary source of seeds of improved tall

Drip irrigation system established at ISG

cultivar CRIC60. Although, the nut production capacity of MOSG is around 0.6 M, the nuts selected as seed nuts from them are only about 0.3 M (50%). Out of this 0.3M, 0.27 M nut rejection is mainly attributed to *Aceria* mite damage. Within this project, a new predatory mite breeding lab was established at MOSG, by renovating an abandoned house in the estate and providing infrastructure facilities to the building. This was further served as a predatory mite supply source for the farmers around. By this way it was expected to increase 0.27 M seed nuts of CRIC60 cultivar within a period of one year.

CRI is presently having two seed gardens under establishment phase; one in near completion in Pallam in Puttlam district (Pallama seed garden or PSG) and the other began in early 2013 in Bingiriya in Kurunagalla district (Kiniyama seed garden) in North-western province. PSG was established to produce in mass scale the improved coconut hybrid CRISL98 characterized for high kernel output per nut and is now in near completion. However, it requires better care and intense management such as soil rehabilitation by organic manure application and moisture conservation practices to initiate its seed production in mass scale in another 3 to 4 years' time. A permanent water source (tube wells) and irrigation system to irrigate seed palms during drought was identified as requirement of PSG within this project. The Kiniyama seed garden was established with the intention of production of Kapruwana coconut hybrid (Sri Lanka green dwarf x san ramon) which was released to growers in 2004 branded for both high yield and high kernel output. This required irrigation facility. Steps had taken by CRI to establish a deep tube well. In 2018, The treasury, through the Ministry of Plantation Industries provided CRI with another Sri Lanka Rs. 24 million to lay out an irrigation system. With that funds, a hose-irrigation system for 160 ac was established at Kiniyama. It was expected to produce about 0.25 million Kapruwan hybrid seeds from this seed garden by the end of 2022.

b) Produce seeds of newly released hybrids by hand pollination techniques

There was very high demand for newly released high yielding coconut hybrids; CRISL98, Kapruwana (CRISL2004), Kap Setha and Kap Suwaya by the growers. However, the availability of seed nuts and resulting seedlings are limited as the respective seed gardens have not yet come into seed production or no seed gardens have been planned yet for some of the hybrids cultivars i.e. for Kap Suwaya and Kap Setha (released in 2012 and 2013 respectively).

Hence seed production of these hybrids is done solely by artificial pollination technique to produce seed in limited numbers. Under this project the number of seed palms in hand pollination was further increase by 1000 new seed palms. The seed production capacity will be increased by 66,500 seed nuts from 33, 500 current production making the total production 0.1M within one-year period.

Composition of target beneficiaries/ stakeholders

a) Direct benefit to the government by earning foreign exchange by exporting value added products and saving foreign exchange curtailing vegetable oil imports ensuring total local consumption and industry requirement of coconut met within the country in the future.

b) Direct benefit to all coconut growers in Sri Lanka ensuring adequate supply of quality coconut planting materials for their planting programme. This will increase their income by improving the productivity of land. Growers in the Northern Province will specially be benefited from this project, which have had no access to improved planting materials in the past many years.

Hose-irrigation system at ISG (left) and surface irrigation system at MOSG (Right)


Pollination working team with the project officers and hand pollinated hybrid seedlings ready for distribution at the PSG


Launching the hand pollination programme at PSG

Summary of the project output

Mode of intervention	Current seed nut production	Estimated future total seed nut production
Mite control, irrigation, moisture conservation and soil rehabilitation at ISG	1.1M	1.665 Million (from 2017 onwards) [Another 0.25 M (from 2022 onwards)]
Mite control programme and changing the irrigation method at MOSG (Improved surface irrigation system with water from Mahaweli irrigation water project).	0.3M	0.57 M (from 2017 onwards)
Accomplishment of Kiniyama seed garden	-	0.25 M (from 2022 onwards)
Hand Pollination programme at PSG	0.034M	0.1 M (from 2017 onwards)

c) Indirect benefit to all coconut consumers by ensuring adequate coconut production in the country meeting the domestic coconut consumption requirement. The hybrid coconut planting programme in the home gardens of householders in remote, semi-urban and urban areas will particularly become self-sufficient in their daily coconut consumption requirement and thereby saving money on purchasing coconut.

d) Indirect benefit to large scale coconut industry owners aiming continues and steady supply of their products for local and/or international market (DC, oil, coir, fiber, charcoal, toddy and arrack, coconut water) by ensuring adequate coconut supply for their industries

Relationship of the project to national priorities
Adequate supply of improved coconut planting materials for increasing the coconut production and developing coconut processing industry in the country are key strategies in the national development programme.

As the project output, improved high yielding seed nut supply will be increased by 1.151 million by 2017-2018, supplying 65% of the total requirement of coconut seed nuts through seed gardens, which is currently 35%.

Further, this will be increased to 77% by the end of 2022. As a result, Plus Palm seed nuts, a poor substitute for the seed nuts from seed gardens, and other bad quality seed nut usage can be reduced by 50% by 2017-2018 and by 75% by the year 2022.

This will improve the proactivity of coconut land increasing the yield per ha and there by the national coconut production. This will help achieving the country's 3800 million nuts per annum coconut production target, which is the estimated coconut requirement to fulfill both the local consumption and the requirement of the coconut industry.

Project outputs:

a) Established a high-tech drip irrigation system with two deep water wells to cater 3083 palms in the hybrid seed production area at the ISG covering about 75 ac.
b) Established a hose-irrigation system with two deep water wells to cater 4734 palms at the PSG covering about 195 ac.
c) Established a surface irrigation system from a Mahaweli irrigation water project to cater 8345 palms at the MOSG covering about 200 ac.
d) Established a hose irrigation system with one deep water wells to cater 8 500 palms at the Kiniyama seed garden covering about 160 ac.
e) Capacity developed for artificial (hand) pollination programme, with 1700 mother palms in pollination for adequate supply of newly released hybrid seednuts for the home garden programme
f) Capacity developed for mite predator breeding at two seed gardens; ISG and MOSG
g) Prepared for climate change by established more than 8000 individual husk pits and 30,000 mulch for moisture conservation for seed palms at three seed gardens
h) Prepared for climate change Applied organic manure for more than 30,000 seed palms at three seed gardens; ISG, PSG, MOSG
i) Produced 100,000 dwarf x tall hybrid seeds and distribution of 2 hybrid seedlings each to 35,000 low income families (home gardens) in the Northern Province.

Project budget in SLR Mn (Summary)

Items	2017	2018	2019	Total (in Rs. Mn)
A) Seed garden development	35.7	35	10.2	80.9
B) hand Pollination programme	13.2	8.6	14.2	36
Total	48.9	43.6	24.4	116.9 (USD 664,205)

A Coconut grower family receiving quality coconut planting materials

PHILIPPINE COCONUT INDUSTRY ' A SLEEPING GIANT'

Dr. William Dar

Could we call the coconut industry a "sleeping giant," as its potential to help fight poverty in the country cannot be discounted, as coconut is third most dominant crop behind rice and corn? But while the productivity of rice and corn farms has been gradually increasing, the country's coconut farms need a shot in the arm.

The average yield of rice farms today is about 4 metric tons per hectare (MT/ha) from approximately 3.9 MT/ha in 2015. Meanwhile, corn yields increased from 2.91 MT/ha in 2016 to 3.1 MT/ha currently.

As for coconut, yields have remained at 40 to 45 nuts per tree annually, which is below the 200 to 300 nuts recorded in countries like India and Brazil. So, I see hope in the drive of the Philippine Coconut Authority's PCA), an agency under the DA, to plant hybrids that have the potential of yielding 150 nuts per year. The hybrids could also yield 300 nuts per year by augmenting hybrid technology with good agricultural practices (GAP).

But the coconut industry needs another market in the Philippines, which Republic Act (RA) 9367 or the "Biofuels Act of 2006" could provide. RA 9367 provides for the increase in the coco methyl esther blend (CME) in diesel sold locally, which could result in billions of pesos in economic benefits for the industry.

A study conducted by the Asian Institute of Petroleum Studies Inc. (AIPSI) showed a 5-percent biodiesel requirement in the Philippines would need at least 360 million liters of CME per year. And to meet that requirement, about 489.8 million kilos of copra is needed.

If all diesel sold in the Philippines gets a 5-percent CME blend, that would result, based on the AIPSI study, to an import reduction in diesel imports by about 430 million liters a year. And with diesel-fed SUVs now the popular choice of affluent motorists,

Dr. William Dar

that figure could even be higher now, as the AIPSI study was made public by the PCA in May last year. At present, the CME blend in locally-sold diesel is only 2 percent.

Environmental, social benefits

The AIPSI study also showed that biodiesel with 5-percent CME blend could reduce by as much as 83 percent the particulate emissions from diesel use, contributing to air pollution reduction. Furthermore, the study said the country spends as much as P16.4 billion a year to treat lung diseases and ailments, including cancer, which could be possibly reduced with the use of biodiesel with 5-percent CME blend.

The PCA estimated the total economic benefits in shifting to 5-percent biodiesel blend at about P110 billion per year, and I believe much of that could redound to the coconut farmer. But the opposite

view to increasing the CME blend in diesel is it would increase the cost of the fuel at the pump stations.

Nonetheless, the potential of increasing the biodiesel blend to 5-percent as stipulated by RA 9367 should never be overlooked, as its socio-economic and environmental impacts could also never be ignored. We also should consider that increasing the earnings of coconut household families would reduce migration towards the urban areas, which is a factor causing congestion and other social problems in cities.

Uncontrolled migration to urban areas could worsen traffic congestion, which in turn increases fuel consumption and worsens air pollution. So, we should also take into account the social impact of increasing the biofuel blend for diesel over the long term. Currently, copra prices are hovering from P20 to P25 per kilo nationwide, with the breakeven cost pegged at P15 per kilo. By opening up a new market for coconut farmers by increasing the biodiesel blend to 5 percent, copra prices should definitely improve.

And since the market for CME are petroleum firms, the potential for the big brother-small brother arrangement could be put in place, or organizing fragmented coconut farmers and assisting them to enter into mutually-beneficial arrangements with big millers or directly with petroleum firms. Such an arrangement should result in coconut farmers getting a fairer share in the economic benefits of increasing the biodiesel blend to 5 percent.

Industry's position

In July this year, the Philippine Biodiesel Association (TPBA) proposed to increase the biodiesel blend to 5 percent by 2021, which I believe is doable and should be the way forward.
The United Coconut Association of the Philippines also said it was pushing for a 3-percent blend this year, 4-percent by 2020 and eventually, 5-percent by 2021.

Ironically, Malaysia and Indonesia have increased their biodiesel blend to 5 percent but using palm oil. Indonesia is even considering a 30-percent biodiesel blend, which is not surprising since it is currently expanding its lands planted to palm. The

Philippine blodiesel

move to a 10-percent palm oil blend for diesel sold in Thailand is also getting off the ground, a move that was made to absorb excess palm oil production.

As mentioned in the first part of this column-series, there is a European ban on palm oil stemming from environmental issues, with Indonesia's burning of its forests to expand palm oil plantations under scrutiny. Perhaps this partly explains why there are moves to increase the palm oil blend for diesel among some Southeast Asian countries. As for the Philippines, increasing the CME blend in diesel to 5 percent should also be viewed in the context of improving the lives of coconut farmers, of which a big percentage still belong to the "poorest of the poor."

A 'sleeping giant'

Along with the measures I mentioned in the first part of this column series like tapping the growing export market for coconut water and milk, intercropping in coconut farms, and planting hybrids in existing farms, I could even say the Philippine coconut industry is a "sleeping giant."

Besides, coconut, mostly in oil form, is already one of the Philippines' top 2 farm exports generating over $1 billion each year. Furthermore, coconut planting has not yet suffered the stigma of having a negative impact on the environment, and there are already numerous studies showing coconut water and oil are beneficial for human health. And perhaps, CME-blended diesel will soon emerge as one of the best fuel for the vehicles, because of its potential impact on the environment through reduced particulate emissions. So now is the time to awake the "sleeping giant" that is the coconut industry.

IT'S TIME FOR THE WORLD TO START CARING ABOUT COCONUT

By a Fair Trade certified staff

The coconut craze isn't necessarily benefiting coconut farmers, and in many cases is driving them into deep poverty. Here are two ways you can help.

Welcome to the age of the coconut, one of the world's most popular superfoods. Whether you call yourself a coconut lover or not, you're likely using in some form every day. Coconut is everywhere—in our meals, body care products, laundry rooms, and medicine cabinets. Ever since coconut water became popular a little over a decade ago, we've continued to be surprised by the versatility of coconut oil, water, meat, palm sugar, and flour.

Coconut water alone is projected to generate $4 billion in revenue between 2015 and 2019. It's reported that the global demand for coconut is growing at a rate of more than 10 percent each year. So coconut is booming, but where's it all coming from? And an even bigger question: can the people growing it keep up with the craze?

70% of the world's coconut can be traced back to small family farms in 3 countries: Indonesia, the Philippines and India. Despite the market growth, the average coconut farmer in the Philippines lives below the poverty line on less than $1 per day (source). Without income to invest back into their crop, farmers are defenseless against typhoons, pests, aging trees and other environmental factors that wipe out entire crops in an instant. At this rate, demand is far outpacing supply, and if we want to keep the coconut industry alive, it's up to us to buy coconut products that help, not hurt.

A cow driven cart carrying coconut harvest in a Gorontalo Province, Indonesia

The challenges

a) Demand is outpacing supply

Regional Asia Pacific production of coconut is only growing at a rate of about 1.3 percent each year (which is troubling with a 10 percent increase in demand), largely due to declining productivity from aging trees. On average, a coconut tree's lifespan is up to 100 years, but peak production happens between ages 10 and 30. As a tree ages, it produces fewer coconuts, leaving farmers to decide whether to remove the tree and replant or continue relying on the dwindling yields. A major factor here is that it takes upwards of five years for a tree to start producing coconuts, which is a long time to wait to put food on the table.

b) Farmers are deeply impoverished

The National Anti-Poverty Commission found that despite the increased demand for coconut, the average coconut farmer lives below the poverty line. The average annual income for a coconut-farming household is around $355 a year, which averages out to less than one dollar a day. Farmers have little to no extra income to invest in resources for their farms, which results in shrinking crops and further declining incomes. And so, the cycle continues. Low incomes, declining production, deeper poverty. The worst part? Younger generations are watching this cycle firsthand, and are looking for the exit. People just don't want to grow up to be coconut farmers; it's simply not a viable profession.

c) Climate change is taking a toll

The Philippines are hit by an average of 20 typhoons per year. In 2013, Typhoon Yolanda damaged 33 million trees, impacting more than one million farmers across the country and causing $369 million in losses. Pests also pose a major threat to coconut yields and can impact trees virtually overnight—an issue that heightens with irregular and warming weather patterns.

Two things you can do to help:

1) Purchase Fair Trade

The Fair Trade Certified seal on your coconut products ensures that your purchase helps replenish the world's dwindling coconut supply, offers family farmers protection against the shady side of the coconut business, and keeps younger generations on the farm. Since 2013, Fair Trade coconut farmers and

Typhoon damaged coconut in the Philippines

workers have earned $2.3 million for tree replanting and nursery creation, disaster relief programs, crop diversification, and other desperately-needed community development projects through purchase of Fair Trade Certified coconut products.

Imagine what's possible if more of us commit to buying Fair Trade coconut. You have the power to take an active role in creating a more sustainable industry, help restore the tree of life, and secure its benefits for the lives that depend on it just by looking for the Fair Trade Certified seal on your packaging.

2) Help spread awareness

By understanding what your dollar is supporting, you can help promote cross-industry dialogue that helps build sustainable livelihoods in more communities. The Fair Trade coconut program is still small, but can play an important role in a much larger, industry-wide solution as it continues to expand over the coming years.

Our video explains two important facets of Fair Trade certification: the Fair Trade standards, which are put in place to protect the farmers and the land they rely on, and the Community Development Fund, an additional amount of money farmers earn when you purchase a coconut product with the Fair Trade Certified seal. Farmers decide democratically how best to use this money to strengthen their farms, livelihoods, and communities. **We call this the Fair Trade Difference.**

Source: https://www.fairtradecertified.org/news/power-of-coconut

DOES COCONUT OIL PROMOTE WEIGHT LOSS?

By Jamie Eske

Many people consider coconut oil to be one of the most weight loss-friendly foods. However, research into losing weight just by adding coconut oil to the diet appears inconsistent. Health claims regarding the consumption of coconut oil for weight loss tend to rely on studies of medium-chain triglyceride (MCT) oils. Coconuts are a good source of naturally occurring MCTs, but coconut oil also contains several other types of fats.

In this article, we discuss whether coconut oil can help people lose weight and how it works. We also cover how to use coconut oil, and the risks and considerations of doing so.

Why does it work?

The MCTs present in coconut oil may promote weight loss by enhancing the body's metabolism and increasing satiety. We discuss these two potential modes of action below:

Metabolism effects

The MCTs in coconut oil may reduce fat accumulation in the body. The body can rapidly metabolize MCTs due to their shorter carbon chains. Unlike LCTs, the body transports MCTs directly to the liver, bypassing the lymphatic system.

The liver rapidly converts MCTs into energy and ketones. Ketones, or ketone bodies, are the byproducts of fat metabolism. Some people believe that ketones are more efficient sources of energy than glucose, which the body normally uses as its main fuel source.

Since the body uses MCTs almost immediately, MCTs may produce a thermogenic effect in the body. In other words, MCTs may enhance the body's ability to burn fat. A 2015 meta-analysis concluded that replacing LCTs with MCTs in the diet may lead to modest reductions in body

High Quality Virgin Coconut Oil

An example of balanced healthy diet

weight, visceral fat, and total body fat. Researchers at Columbia University Medical Center in New York City, NY, investigated the thermogenic effects of coconut oil compared with corn oil. They conducted a small study in 2017 that involved 15 adolescents. Its results suggest that coconut oil did not enhance thermogenesis.

Satiety enhancement

The term satiety refers to the feeling of fullness that occurs after eating. Satiety plays an essential role in weight loss because it prevents people from eating again until they feel hungry. Eating high-fat foods may contribute to higher levels of satiety.

In a study from 2017, participants consumed a breakfast smoothie containing either MCT oil, coconut oil, or vegetable oil on 3 separate days. People in the MCT oil group had greater reductions in food intake and higher levels of satiety compared with those in the coconut and vegetable oil groups. The researchers attributed the differences in satiety to the fact that coconut oil contains far fewer MCTs than pure MCT oil.

In a 2016 study, researchers compared the effects of coconut oil and sunflower oil on the appetites of 36 participants. During the study, the scientists asked the participants to eat ice-cream containing different ratios of coconut oil and sunflower oil 45 minutes before eating their dinner.

Although those who ate ice-cream containing larger proportions of coconut oil ate less for dinner, they ended up consuming more calories from snacks later in the evening. These findings suggest that simply eating coconut oil will not result in dramatic weight loss. However, this should not deter people from consuming coconut oil.

How to use

Coconut oil consumption works best as part of a balanced diet high in fish and fresh produce and low in processed foods. People who consume coconut oil without making any other dietary changes may be less likely to lose weight. Though consuming MCT oil may offer weight loss benefits, it has limited culinary applications. Due to its low smoke point, MCT oil cannot replace cooking fats, such as butter and olive oil. People can safely cook with coconut oil. Despite its name, coconut oil behaves very similarly to butter. Both forms of fat contain high concentrations of saturated fat that keep them solid at room temperature.

Besides cooking and baking with coconut oil, people can add it to beverages such as coffee, tea, and smoothies. People who enjoy the taste of coconut oil can safely consume it raw.

Risks and considerations

Coconut oil consists primarily of saturated fats, which can have adverse health effects, such as raising total cholesterol levels.

The Dietary Guidelines for Americans 2015–2020 suggest that saturated fats should account for less than 10 percent of a person's daily calorie intake. Findings from a 2018 study suggest that consuming coconut oil can increase high-density lipoprotein (HDL) cholesterol levels without affecting levels of low-density lipoprotein (LDL) cholesterol. Doctors often refer to HDL cholesterol as "good cholesterol" and LDL cholesterol as "bad cholesterol." The study also found that consuming coconut oil did not affect the body weight or body mass index (BMI) of participants. People in the study consumed 50 grams of coconut oil per day, which far exceeds the recommended daily amount of fat.

Summary

Studies into the effects of coconut oil on weight have produced inconsistent and contradictory results. More research will help scientists draw further conclusions about the potential health benefits of consuming coconut oil. Instead of adding coconut oil to a diet high in carbohydrates and processed foods, consider using coconut oil to replace calories from other cooking fats. Generally, the most effective way for a person to lose weight is by getting regular physical activity, reducing daily calorie intake, and eating a balanced and healthful diet.

Source: https://www.medicalnewstoday.com/articles/324729.php

NOTES ON BETTER PERFORMING SELECTIONS MADE FROM THE CONSERVED PACIFIC COCONUT ACCESSIONS AT ANDAMAN AND NICOBAR ISLANDS

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Coconut palm (*Cocos nucifera* L). is one of the important crops of tropical regions supports the livelihoods of millions of people around the world. Most of the widely grown varieties of coconut have been evolved through selection from indigenous and exotic cultivars of different regions for desirable characters such as high yield of fruits with high out turn of oil yielding copra, sweet and nutritive tender coconuts, resistance/ tolerance to biotic and abiotic factors, suitability for product diversification. Coconut is the predominant crop of Andaman & Nicobar Islands of India, covering more than 50% of the area under agricultural use. Besides the local collections from these Islands, twenty-four Pacific Ocean collections are conserved (planted during 1986) at World Coconut Germplasm Centre (WCGC), Sippighat farm, South Andaman (under the erstwhile Centre of ICAR-Central Plantation Crops Research Institute, Kasaragod) presently under ICAR-Central

Agricultural Research Institute, Port Blair, India. These Pacific coconut accessions at WCGC are the direct introductions brought from the respective place of origin viz., Solomon Island, Fiji, American Samoa, American Tonga, French Polynesia and Papua New Guinea. While the accessions were planted and evaluated for further multiplication for planting in field gene banks at Indian mainland, few selections made from these collections for further exploitation.

The selections named as Annapurna, Surya, Omkar and Chandan have been released and recommended for growing in Andaman and Nicobar Islands by the Group meeting of scientists of All India Coordinated Research Project on Palms held during 2013. The better performing dwarf selections are since then used for distribution among the interested growers. This paper contains some notes on the characterization of those selections comprising the performance for desirable traits.

Annapurna (CIARI-C1)

It is a selection from CPCRI accession IND 099, Niu Leka Dwarf population, introduced from Fiji in 1983 (EC 415217) and conserved at World Coconut Germplasm Centre, Sipighat, Andaman. The palms of this selection are categorized as dwarf with compact canopy, exhibits erect leaf tip, stout stem with prominently visible, very closely arranged leaf scars, giving unique intermittently constricted appearance to stem. Although the palms of this selection are categorized as dwarf based on the relative height of the stem, other characters such as thick copra, high copra out turn, cross pollination and strong leaf and bunch attachment as like many other tall cultivars. Hence, the selection could be easily categorized as a dwarf with desirable traits of tall. The selection has been released as a dual-purpose variety suitable for higher copra production and tender nut, suitable for A& N Islands.

The palms of this selection recorded flower initiation in 65 months after planting under rainfed conditions of Andaman and Nicobar Islands. The performance of this selection (under rain fed conditions), indicated mean yield of 52 nuts/palm/year (9100 nuts/ha/year) with copra

Annapurna

out turn of 12.74 kg copra/palm/year (2.23 t copra/ha/year). The oil yield from copra was estimated to be 8.23 kg palm/year (1.44 t oil/ha/year). The fruits of this selection yield an average of 470 ml tender nut water per fruit.

Based on the data of 50% better performing palms of the selection, the potential yield performance was assessed as 110 nuts/palm/year (19250 nuts/ha/year) with copra out turn of 26.95 kg copra/palm/year (4.72 t copra/ha/year). The potential oil yield from this could be 17.41 kg oil/palm/year (3.05 t oil/ha/year).

Annapurna selection is also suitable for tender coconut production with tender nut water content of 470 ml per fruit at 6 to 7-month stage; Good Tender nut water taste; TSS of 5.40 Brix; Na - 35.5 ppm; K - 2216 ppm; Total sugars - 5.12 g/100 ml; Amino acids - 1.48 mg/100 ml.

Surya (CIARI-C2)

It is a selection from CPCRI accession IND 112, Hari Papua Orange Dwarf population (EC 415230) introduced from French Polynesia in 1983, conserved at World Coconut Germplasm Centre, Sipighat, Andaman. The palms of Surya are categorized as dwarf with slender stem, shorter drooping leaves, stem has no bole at the base. The variety is suitable for tender nut and ornamental purpose, suitable for coconut growing tracts of A& N islands and use in landscape gardening.

The fruits of Surya are orange (red-yellow) in colour, small-sized and oval shaped. The average fruit weight was recorded as 410 g with copra content of 70 g. The copra oil content was estimated as 62.5%.

Flower initiation was observed among the palms of Surya in 26-30 months after planting whereas very early flowering as 18 months after planting has also been observed under rainfed conditions. The performance in evaluation trial (rain fed conditions) showed mean fruit yield of 107 nuts/palm/year (18725 nuts/ha/year) with copra out turn of 7.49 kg copra/palm/year (1.31 t copra/ha/year) which is considered very low. The estimated oil yield was 4.68 kg oil/palm/year (0.82 t oil/ha/year).

Based on the data of 50% better performing palms of the selection, the potential yield performance was assessed as 161 nuts/palm/year (28175 nuts/ha/year) with copra out turn of 11.27 kg copra/palm/year (1.97 t copra/ha/year). The potential oil yield from this could be 7.04 kg oil/palm/year (1.23 t oil/ha/year).

Surya

The smaller sized tender fruits yield on an average of 154 ml tender nut per fruit but taste has been categorized as Very Good, with TSS - 6.30 Brix; Na - 34.7 ppm; K - 2279 ppm; Total sugars- 4.54 g/100 ml; Amino acids - 1.52 mg/100 ml.

Omkar (CIARI-C3)

This yellow fruited dwarf selection was made from CPCRI accession IND 102, Niu Oma Yellow Dwarf population (EC 415220), introduced from American Samoa in 1983 and conserved at World The fruits of the Annapurna are green, categorized as large-sized with oval shape. The average fruit weight was recorded as 1521 g and the average copra content as 245 g. The copra oil content was estimated as 64.6%.

Coconut Germplasm Centre, Sipighat, Andaman. The palms are categorized as dwarf with slender stem, shorter drooping leaves, stem without bole at the base. The selection is recommended for ornamental purpose, suitable for coconut growing tracts of A& N islands and in landscape gardening. Although the fruits are also useful as like any other coconut, they are not much useful for fruit purpose as the fruits are very small with very less water and kernel.

The fruits are yellow coloured, small-sized, pear shaped, and the average fruit weight recorded as 432 g with 74g copra. The oil content was

estimated as 64.5% from copra. The husk fibres are observed to be firm and husking the matured dry fruits is difficult when compared to other coconut varieties. Under rainfed conditions, the flower initiation was observed in 40 months after planting.

The performance in evaluation trial (rain fed conditions) for yield indicated a mean fruit yield of 113 nuts/palm/year (19775 nuts/ha/year) with estimated 8.31 kg copra/palm/year (1.45 t copra/ ha/year). The oil yield was estimated as 5.36 kg oil/palm/year (0.94 t oil/ha/year). The average tender nut water content was observed as 117 ml. The potential yield performance was assessed as 170 nuts/palm/year (29750 nuts/ha/year) with 12.5 kg copra/palm/year (2.18 t copra/ha/year) having 8.06 kg oil/palm/year (1.41 t oil/ha/year). Analyses of tender fruits revealed the average tender nut water content as 117 ml; taste categorized as Very Good with TSS of 5.70 Brix; Na - 31.05 ppm; K - 2133 ppm; Total sugars - 4.62 g/100 ml; Amino acids - 1.44 mg/100 ml.

Under evaluation of open pollinated progenies, more than 80 per cent show similarity to parental palms indicating the high degree of self-pollination. However, the seed nuts are to be sown immediately as the nut water is very less in matured fruits.

Chandan (CIARI-C4)

This better performing selection was made from CPCRI accession IND 116, Nikkore Orange Dwarf (EC 415234) population, introduced from Papua New Guinea in 1983 and conserved at World Coconut Germplasm Centre, Sippighat, Andaman. The palms of this selection possess slender stem and shorter leaves and no bole at the base of the stem. The variety is recommended for ornamental purpose, suitable for coconut growing tracts of A& N Island ecosystems and in landscape gardening. The fruits of Chandan produced in clusters on bunches, attractive deep orange, small-sized, oval shaped. The average fruit weight was recorded as 545 g having copra content of 101.6 g. The copra oil content was observed as 66%. The husk fibres are firm making husking the matured dry fruits a difficult process.

Under rainfed conditions, the flower initiation was observed in 30 months after planting. The tender nut water content wa recorded as 198 ml; taste categorized as Very Good with TSS of 4.90 Brix; Na

Chandran

- 35.27 ppm; K - 2651 ppm; Total sugars - 4.76 g/100 ml; Amino acids - 1.44 mg/100 ml.
The yield performance in evaluation trial (rain fed conditions) revealed mean nut production as 98 nuts/palm/year (17150 nuts/ha/year) having copra out turn of 9.96 kg copra/palm/year (1.74 t copra/ha/year). The estimated oil yield was recorded as 6.57 kg/palm/year (1.15 t oil/ha/ year). The potential yield based on the better performing 50% of palms, the nut yield was estimated at 156/palm/year (27300 nuts/ha/year) with copra out turn of 15.85 kg/palm/year (2.77 t copra/ha/year). The estimated potential oil yield was 10.46 kg oil/palm/year (1.83 t oil/ha/year).

Over 70 per cent of open pollinated progenies of Chandan selection show similarity to parental palms. The seed nuts are to be sown immediately as the nut water is very less in matured fruits.

Conclusion

The four dwarf selections made from conserved pacific coconut collections at ICAR-CIARI, Port Blair are being promoted for use in establishing plantations, planting in home gardens and in ornamental landscaping in the Islands. The Institute regularly produces seed nuts from these selections for production of quality seedlings.

NURSERY PRACTICES AND SEEDLING SELECTION IN COCONUT

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ICAR- CPCRI, Kasargod

Introduction

Best quality coconut seedlings should be selected to start a plantation since the crop will be in the field for many years. The long life span and large capital outlay involved in establishing a coconut plantation, necessitates the selection of good quality seed nuts and seedlings, as a first step for the successful cultivation of the crop. If poor quality planting materials are used for planting, the new plantation can prove to be uneconomic, causing considerable loss of time and money to the grower. Therefore, selection of good quality seed nuts and seedlings is of great importance in the establishment of coconut plantations. Further, as coconut is cross pollinated, the palms do not breed true making the selection of seed nuts and seedlings more difficult and at the same time, important. It is possible to improve the quality of the planting materials through a series of selections at the various stages of seed and seedling production. The various aspects of nursery techniques and selection procedures are discussed in the this article.

Mother palm selection

For production of quality planting material, it is essential to have good quality mother palms of the desired varieties. In the absence of commercially viable vegetative propagation techniques, only seed propagation is possible. Therefore, mother palm selection is a key factor in planting material production of coconut. Trees growing near cattle sheds, wells and other favored conditions should be avoided, as their true genetic potential maybe masked because of favorable environment. Mother palms should be aged 22 years or more since it will be necessary to observe their yield for at least 10 years after stabilization of yield. From young seed

gardens, seed nuts can be collected irrespective of the age of the mother palms, since only high yielding palms with known genetic potential are maintained in the seed gardens. (Patel, 1938).

Collection and Storage of nuts

Seed nuts can be collected throughout the year. However, it is preferable to collect seed nuts during the period from January to May in the West Coast region, so that sowing can be taken up with the onset of south west monsoon. In the East Coast, seed nuts are collected during the period from May to September and are sown during October–November with the onset of north east monsoon. Fully matured nuts i.e. about 12 months old should be harvested. Care should be taken not to damage the seed nuts while harvesting. Nuts which are too big or too small in the bunch and also the nuts of irregular shape and size should be discarded. Seed nuts of tall varieties are to be sown 2-3 months after collection, whereas dwarfs should be sown within 15-30 days after harvest (Liyanage, 1950). For storing, arrange the seed nuts with the stalk-end up over an 8 cm layer of sand in a shed and cover with sand to prevent drying of nut water. The nuts can also be stored in plots, provided the soil is sandy and the ground is sufficiently shaded. (John and Narayana, 1942).

The important feature of a good motherpalm
a) Regular bearer,
b) Straight stout trunk with even growth and closely spaced leaf scars,
c) Spherical or semi-spherical crown with short fronds,
d) Short and stout inflorescence stalk with bunches, preferably resting on the leaf petioles of the lower whorl,
e) More than 30 leaves and 12 inflorescences carried evenly on the crown,
f) Inflorescence with 25 or more female flowers,
g) Consistent high nut yield (about 70 to 80 nuts/ annum under rainfed conditions or 100-120 nuts under irrigated conditions),
g) More than 150g copra per nut,
h) Absence of disease and pest incidence.

Nursery site selection

A good nursery should be open, level and well-drained have loose or slightly textured soil to facilitate nursery operations. It should have a good source of water for irrigation, proper shade and accessible to transportation. It should be far from potential sources of coconut insect pests and diseases. A fence for security, a shed for implements and supplies and trained manpower are the other requirements for a coconut nursery.

a. Soil: Coconut is adapted to a wide range of soil types from coarse sand to deep soils. However, well-drained friable sandy, sandy loam/loam soils are best suited for coconut nursery due to the relative ease in removing the seedlings from the nursery. In laterite soils, sand has to be applied to the nursery beds. Heavy/clayey soils and waterlogged soils are to be avoided. The ideal soil pH ranges from 5.5 to 7.0 and the seedlings are tolerant to a pH range from 4.5 to 8.5. Under irrigation, coconut seedlings tolerate saline and alkaline soils.

b. Climate: Coconut palms are cultivated in humid regions lying between latitude 27^{o}N and 27^{o}S. They are well adapted to full sunlight. However, the nursery area is to be preferably shaded to get good quality seedlings without sun scorch. The optimum temperature range for better growth of seedlings is from 21^{o}C to 35^{o}C. Though coconut can withstand temperatures beyond this range, the growth, development and yield will be affected. Coconut palms are well adapted to areas receiving an annual rainfall ranging from 600mm to 4000mm. Seedlings can be produced at an altitude ranging from sea level to an elevation 800m above mean sea level.

c. Water Source: A perennial source of water is required for maintenance of coconut palms and irrigation is essential for obtaining good coconut yield. Further, the nursery has to be irrigated regularly for production of planting material. Sprinkler/ micro jet sprinkler/hose irrigation systems are well suited for irrigating coconut nurseries.

d. Nursery Structures: Nursery can be raised in the interspaces of the coconut plantation. The nursery area is to be provided with shade using 50-75% shade net if the nursery area is in an open space. About 120m^2 area would be required to sow 1000 nuts in flat or raised beds whereas larger area of 200m^2 would be required to maintain 1000 poly bag coconut seedlings.

Seedling Production:

a. Time of sowing: The time of sowing seed nuts in the nursery will vary depending on the location (agro-climatic zone) and the monsoon. The most appropriate time for sowing seed nuts in the West Coast region is May-June. However, seed nuts can be sown all round the year under favorable climatic conditions and good irrigation facilities.

b. Nursery bed preparation: Seedbeds should be prepared in an area having loose and well-drained soil. Raised beds of 10-20 cm height are made to provide good drainage. Seedbeds are generally of 1m width and convenient length with 75cm space between beds. The seedbeds should be drenched with Chlorpyriphos @ 0.05% before sowing of seed nuts, in areas having termite problem. To prevent bud rot in seedlings, the nursery can be drenched with 1% Bordeaux mixture, in bud rot endemic areas.

c. Sowing of nuts: Plant the seed nuts at a spacing of 30 cm (between rows) x 30 cm (between nuts) with four or five rows per bed. The nuts may be planted either horizontally with the widest of the segments at the top or vertically with stalk-end up. While sowing vertically, set the nuts firmly in either upright or slightly tilted position with the germ end at the top. Then cover them with soil, with about 2/3 of their size buried or plant the seed nuts in the beds in trenches 25-30 cm deep and cover with soil so that top portion of husk alone is visible. Keep a record file and a sign board placed in front of each bed indicating the: name of variety/type sown, date of sowing, number of nuts sown, seedbed number and date of harvest.

d. Irrigation: The seed beds should be irrigated regularly to ensure that the soil is moist. After sowing, the seed beds should be irrigated thoroughly to saturation levels and repeated as frequently as necessary. During summer months, the beds may be irrigated on alternate days. Irrigation can be provided through hose/micro sprinklers.

e. Mulching: The seed beds can be covered with suitable mulch (coconut leaves, straw or green leaves etc.) to conserve moisture and check the weed growth.

f. Weeding: The nursery should be kept free of weeds to allow good growth of the seedlings.

g. Management: A record should be maintained indicating the name of variety sown, date of sowing, number of nuts sown, seedbed number and date of seed nut harvest. A signboard should be placed preferably in front of each bed indicating the name of variety sown along with the date of sowing.

Seed nuts of tall varieties begin germination within 60-130 days after sowing and seed nuts of dwarf varieties germinate 30-95 days after sowing. Generally, germination is recorded till the fifth month of sowing and a good seed lot will give 80 to 90% germination. Seed nuts that do not germinate within 5 months after sowing as well as those with dead sprouts can be removed from the nursery. Such rejected seed nuts can be used for production of copra.

Chemical fertilizers need not be applied to the seedlings in the nursery since the seedlings are usually nourished by the endosperm. Moreover, application of chemical fertilizers can mask the true genetic potential of seedlings, making the selection of genetically superior seedlings difficult.

Poly bag seedling production

Poly bag nursery can be adopted for producing more vigorous seedlings with better root system. Compared to the nursery in the field, watering, weeding and roguing operations for the elimination of unwanted seedlings are easier in poly bag nursery. The seedlings can be raised in black polythene bags (500-gauge thickness) of 60 cm x 45 cm size for bigger nuts and 45 cm x 45 cm for smaller nuts. The bottom of the bags is to be provided with 8-10 holes for draining the excess water.

To fill 100 bags, around 2-2.5m^3 of potting mixture will be required. The commonly recommended potting media are top soil mixed with sand in 3:1 ratio or fertile top soil, sand and well rotten and powdered cattle manure/vermicompost in the ratio of 3:1:1. Red earth, well rotten and powdered cattle manure/vermicompost and sand in 1:1:1 ratio can also be used. Fertilizers can be applied in the poly bags @ 20g ammonium sulphate and 25g muriate of p otash per bag aftert wo months of germination and 45g of ammonium sulphate and 45g of muriate of potash per bag after four months of germination. Seedlings are to be watered after application of fertilizers.

In order to produce poly bag seedlings, the seed nuts are initially sown very closely and allowed to germinate in a pre nursery bed. The germinated nuts are picked out from nursery once in a week, until 80% of nuts have germinated or up to 5 months from sowing, whichever is earlier. The germinated nuts are placed in half filled poly bags with the sprout positioned upwards in the centre of the bag and sufficient potting mixture is added to fill the bags up to two-third portion and the sides slightly pressed to keep the nut firm.

Important diseases/pests and their management

There are no serious pest and diseases in coconut nurseries. However, bud rot affected seedlings are to be avoided for planting.

Bud rot: The fungus, Phytopthora palmivora, causes this disease. The symptoms are yellowing and withering of the spindle leaf followed by drying and death of the seedlings. The spindle of the affected seedlings will easily come out with a gentle pull and rotting can be seen in the lower end of the detached leaf. The affected portion emits a foul smell. Though it is not a major problem in coconut nurseries, the affected seedlings are to be removed and the surrounding seedlings treated with 1% Bordeaux mixture**.**

Scale insect (Aspidiotus destructor): The characteristic symptom is yellowing of leaves and presence of scale insect underneath the leaves. Though the insects do not pose serious threat to the seedlings, this can be controlled by drenching the nursery with Dimethoate @ 0.05% to ensure good quality and healthy foliage of seedlings.

Termite: Drying of the sprouts and leaves are the symptoms of termite damage in the nursery. Drenching the nursery with Chlorpyriphos @ 0.05% will control the termites.

White grub *(Leucopholis coneophora)*: This occurs mainly in sandy soils. The characteristic symptom is yellowing of leaves followed by drying of leaves and death of the seedlings due to severe root damage. This can be controlled by application of Phorate 10 G @ 15g/seedling.

Selection of seedlings

Remove seed nuts, which do not germinate within 6 months after sowing as well as those with dead sprouts. Select only good quality seedlings (9-12 months old) by a rigorous selection based on the following characteristics.

Since early germination is one of the criteria for the selection of seedlings, the storing and sowing of seed nuts should be in lots according to the harvest and should not be bulked.

1. Early germination, rapid growth and seedling vigour.
2. Six to eight leaves for 10-12 month old seedlings and at least four leaves for 9-month-old seedlings.
3. Collar girth of 10-12 cm.
4. Early splitting of leaves. 1.(Jack and Sands, 1929 and Liyanage, 1955)

Removal and transportation of seedlings

Seedlings should be removed from the nursery by lifting with a spade. Seedlings should never be lifted from the soil by pulling the leaves or petiole. The seedlings should be planted as early as possible after removal from the nursery. The seedlings can be kept for about four weeks under careful storage after removal from the nursery. In such cases, the seedlings should be kept under shade and also watered.

Seedlings can be compactly packed and transported. For very long distance transportation, special care should be taken to pack the seedlings in moss/coir pith/other moisture retaining material. Poly bag seedlings can be transported as such and planted directly in the field, after cutting and removal of the base of the poly bag to facilitate growth of roots.

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SECOND INTERNATIONAL CERTIFICATE COURSE FOR COCONUT DEVELOPMENT OFFICERS AT THE COCONUT RESEARCH INSTITUTE, SRI LANKA

Dr. Lalith Perera,
The Course Director/Deputy Director (Research),
Coconut Research Institute, Sri Lanka.

The Coconut Research Institute of Sri Lanka (CRISL) inaugurated the Second International Certificate Course for Coconut Development Officers on the 09th of September 2019, at the Hotel Goldi Sands, Negombo. This comprehensive two-month training course was conducted by the CRISL on behalf the International Coconut Community (ICC) providing training on scientific coconut cultivation, management and value addition to other coconut growing countries. This annual training program was organized and partially funded by the International Coconut Community (ICC) at CRISL, CRISL being recognized by the ICC as an accomplished and leading research institute in the world, solely dedicated to coconut research.

Mr. J A Ranjith, the Secretary to the Minister of Plantation Industries was present at the inauguration as the Chief Guest. There were 21 international participants in the course from 14 coconut growing countries, namely Papua New Guinea, Tonga, Kiribati, Tuvalu, Vanuatu, Samoa, Kenya, South Africa, Indonesia, Thailand, Solomon Islands, Cook Island, Fiji and Federation of Micronesia. These 21 participants included two private sponsors one from Indonesia and other from South Africa. An updated second edition of the comprehensive training manual was presented to the Chief Guest as well as to each participant as a handbook on coconut cultivation and management for their use.

Mr. Alan Aku, the Managing Director of the Kokonas Indastri Koporesen (KIK), Papua New Guinea (PNG), sent complements to CRISL on this occasion, saying "KIK Management is committed to training all its CDOs through CRISL because this course is very relevant to our industry's development and advancement. KIK is already seeing the benefits of our first batch of trainees and so we are very pleased for CRISL and Sri Lanka in hosting this training".

The course comprised combination of theory and practice such as lectures, demonstrations, on-site lab & field work, group work and many field visits to give the participants the scientific knowledge behind practices and to give them enough practical exposure. The field work and practical exercise were conducted exclusively in the CRI owned and managed coconut sub-research stations and coconut seed gardens. The course is conducted by the senior research staff of the institute where there is more than 30 internationally and locally qualified research staff, many with doctorates and with long years of research and management experience in the coconut field.

Group Photo after the Graduation Ceremony

The course content was designed around major themes such as trends in global coconut industry, increasing coconut yield and productivity, reducing field losses by pest and disease management, optimizing the net income from coconut, post-harvest techniques, climate smart cultivation, climate hazards mitigation, yield prediction, nutrient management and organic coconut cultivation, market behavior and policies on coconut, technology transfer methodologies and plantation management strategies to cover the entire spectrum of coconut cultivation, management value addition and technology transfer.

Around the above major themes, the course covered biology and eco-physiological requirements of coconut palm, inflorescence development and major factors determining fruit set and yield fluctuation in coconut**,** principles of coconut breeding, mother palm selection, seed garden concept, hybrid seed production, pollen processing, artificial pollination, emasculation and legitimacy checking, improved coconut cultivars/ hybrids, conservation of coconut germplasm and global status, experimental design and multi-locational evaluation of improved cultivars/hybrids and important traits for data collection, decision making in replanting of coconut, field planting and aftercare of coconut seedlings, nursery management and seedling certification, use of molecular tools in plant breeding and pathogen diagnosis, basics of tissue culture techniques, application of tissue culture techniques in coconut, past present and future trends of climate in coconut growing countries, physiological aspects of screening coconut palm for biotic and abiotic stresses and development of drought tolerant coconut cultivars, weather stations and data recording, simple data analysis in Excel, soil characteristics and land suitability for coconut, soil profile and soil suitability maps, plant nutrient requirements of coconut, types of fertilizer, nutrient requirements of coconut, nutrient deficiencies of coconut, soil and leaf sampling procedures and analysis, irrigation and fertigation, inorganic and organic fertilizer recommendations for coconut, site specific fertilizer recommendations, organic Fertilizer: usefulness and production, use of organic fertilizer in coconut cultivation: Case study, organic Agriculture, certification of organic products and international certification bodies, standards and certification of organic coconut products, inter-cropping under coconut plantations, livestock management in coconut plantations, soil conservations in coconut plantations, moisture conservation in coconut lands, weed management, introduction on Red Palm Weevil and its control, introduction to Rhinoceros beetle and its control, introduction to coconut mite and its control, introduction to coconut black-headed caterpillar & control, introduction to *Plesispa* and *Brontispa* beetles and their control, other pests of coconut, synthesis of red weevil pheromone, major diseases of coconut in the world and their control, importance of coconut harvesting, role of the "Plant Quarantine Institutes" in pest and disease control specially in Island nations, mechanizations in coconut lands (Picking, weed management, fertilizer application etc., introduction to coconut based products, methods of dehydration of coconut kernel, manufacturing of coconut oil and other kernel based products, coconut milk and related products, coconut water based products, quality control of coconut products, coir and coir based products, manufacturing of coconut oil and virgin coconut oil, manufacturing of coconut jam, paste and other kernel-based products, market behavior, supply and demand of coconut and coconut-based products in the global market, value chain analysis in coconut, coconut production policies and programmes in Sri Lanka and selected countries, economics of coconut cultivation, productivity management in coconut industry, economics of intercropping and coconut-based farming systems, coconut estate management, agriculture extension theories, use of social media in agricultural extension, coconut technology transfer CRISL module.

Handing Over Training Manual to Sri J.A. Ranjith, the Secretary to the Minister of Plantation Industries

A View of Class Interaction

In addition to the course content related to coconut cultivation and management, an interesting full day workshop was also conducted for the participants on leadership development and effective communication/corporate leadership. Furthermore, to provide the participants an opportunity to see scenic places in the country several leisure tours were also organized during weekends. Visit to the famous Kandy city in the hill country, the Elephant Orphanage at Pinnawella, the world-famous Temple of the Sacred Tooth Relic of Buddha, the Royal Botanical Gardens and the campus of the University of Peradeniya, the historic ancient

The trainees after doing their Laboratory work

Practical Field Activities

The Trainees Receiving Centificates during the Graduation Ceremony

kingdom in Pollonnaruwa, and the world renowned Sigiriya, the Rock Palace, the Dambulla rock temple are some of the places the participants visited. The participants also had the opportunity to travel down to the southern coast of Sri Lanka to enjoy the gorgeous sandy beaches of Sri Lanka and to have a see bath in the Weligama sea. The course was ended with a Colombo city tour and shopping in Colombo.

The programme was concluded on the 8th November, 2019 with a farewell dinner after an in-depth evaluation of the participants attended by Mr. Uron Salum, Executive Director of ICC, Ms. Mridula Kottekate Assistant Director of the ICC and Mr. Ben Tara, Administration and Human Resource Executive of KIK, PNG as international evaluators to the course. This was followed by the Graduation Ceremony and distribution of certificates. The Graduation Ceremony was graced by Mr. Uron Salum, Executive Director of ICC as the Chief Guest along with Ms. Mridula Kottekate of the ICC and Mr. Ben Tara, of KIK, PNG and many other distinguish guests and CRI staff.

All those who were connected with the event, including the participants, the international evaluation team, Executive Director of the ICC, Assistant Director of ICC, Plantation Industries Ministry officials and the resource staff of the CRISL were very impressed by the very high standard that the certificate course achieved in 2019 too. The immense contribution of Dr. Kasun Meegahakumbura and Dr. Auchitha Dissananayke, the two course coordinators of the certificate course and the dedicated and highly committed research and technical staff of the CRISL are gratefully acknowledged. Mr. Asoka Padeniya, Chairman of the Coconut Research Board, Dr. C S Ranasinghe, the Director of the CRISL have played a distinct role in making the certificate course a success.

INTERNATIONAL COCONUT CONFERENCE AND EXPO 2019, KERALA, INDIA

Mridula K
ICC Assistant Director

The Government of Kerala and the Coconut Development Board, Government of India, have jointly organised the International Conference and Exposition on Coconut Development in order to formulate ways of taking the sector forward. The two-day Conference and Exposition held on November 2 and 3, 2019 at The Gateway Hotel, Kozhikode, Kerala.

The Theme of the Conference was Towards Industry -Led Growth and was organised by the State Planning Board in collaboration with the Kerala State Industrial Development Corporation. The Exposition was organised by Kerala State Industrial Development Corporation.

Shri. Pinarayi Vijayan, Chief Minister, Kerala inaugurated the programme. In his inaugural address he called up for an industry-led growth to establish Kerala as a leader in the coconut sector and a prime position in production and value addition of coconut. A coconut supply chain which has a strong industry linkage should be developed in state to maximize the returns. Charting out the strategy for the State with regard to the coconut sector, the Chief Minister urged the conference to address the developmental and policy issues with respect to coconut sector in order to ensure higher income for farmers and the industry.

The strategy is to put Kerala on an enhanced and sustained growth path in coconut sector through industry led growth in primary and secondary processing. Pointing out that the sector is facing strong challenges with respect to productivity and price, he said, that it is high time that the state took active steps for increasing income from the sector. This is possible only through industry led growth. The coconut industry has to strengthen the state's economy.

Dwelling on the threats faced by coconut sector in the State, the Chief Minister said that following the Exim policy, which gets revised every year, the country is seeing spree of importing palmolein, which in turn creates glut of copra and coconut oil. Due to heavy import, price of coconut falls day by day and the cultivators find it difficult to market their produce. This affects the sector heavily.
Kerala Government has been taking a number of steps in reviving the State's coconut sector to its past glory. The Government has constituted a Coconut Development Council which aims to expand the area and increase the productivity of

Inaugural Ceremony of the International Conference and Exhibition 2019

coconut in the State to ensure higher and sustained income to farmers through value addition and other programmes. As part of area expansion programmes, the Council targets to plant 15 lakh good quality seedlings in the state over two years. It also envisages to encourage more startups, enterprises and agro parks for promoting value addition and to strengthen marketing facilities. A coconut supply chain which has a strong industry linkage will be developed in the state to maximize the returns.

Shri. Uron N Salum, Executive Director, International Coconut Community, attended the Conference. In his key-note address pointed out the need for establishing a strong coconut sector. Across the globe a major change called, Coconut Revolution or Coconut Come back is being observed. He added that value added coconut products are gaining popularity and he called upon the need for the industry to stand united which currently stands fragmented for ensuring fair and steady price to the farmers.

Shri E P Jayarajan, Minister for Industries and Sports, Government of Kerala in his address observed that over the last few years' participation of people particularly that of the youth in coconut industry records to be on a decreasing trend.

Dr. Thomas Isaac, Minister for Coir and Finance, Government of Kerala observed that the sector faces two issues, the reduction in productivity and fall in gross cropped area, and lack of value addition. The share of byproducts of coconut, which was 40 per cent has come down to 10 per cent now. This has to be reversed, he said adding that a periodic revival of byproduct industry should be undertaken through product diversification.

Dr M S Swaminathan, Founder Chairperson M S Swaminathan Research Foundation, in his video message said that the concept of three-dimensional farming or multiple cropping system should efficiently utilized in this sector to take the maximum advantage of soil, water and air.

Dr V K Ramachandran, Vice Chairperson, State Planning Board, Kerala in his address spoke on the need for bringing back the preeminence of coconut and upgrading the value of coconut by reconsidering it as an industrial and agriculture product.

Smt. G Jayalakshmi IAS, Chairperson, Coconut Development Board of India, spoke on the present status of coconut cultivation and processing in the country. She told that despite the several adversities faced by the sector, coconut is regaining its lost glory and is being termed globally as a wonder crop and coconut products have attained the status of a super food. She congratulated the Government of Kerala for organizing International Conference and Exposition on Coconut Development aiming at the sustained development of coconut cultivation and industry in the state of Kerala.

She added that the nutritive and healthy attributes of coconut which the coconut consuming world believed based on anecdotal evidences are now being proven through conclusive clinical studies in different parts of the globe. It is the right time for this conference to add to the sustainability of the sector so that we don't run out of coconuts when the global demand is rising.

Coconut is a crop which has much potential for value addition and the involvement of the

A View of the Exposition Area

Industries Department will definitely provide impetus for development of the coconut industry in the state. She further informed that Coconut Development Board facilitates establishment of processing units through technical and financial assistance. She hoped that exploiting the potential of processing and value addition of coconut will result in increased and remunerative prices to the small holder coconut farmers thereby making the country closer to the vision of doubling the farmers income by 2022.

The Conference brought together experience and expertise from Kerala and other parts of India and the world. It has raised issues of modern coconut farming, the most recent technological developments in value-addition, the contemporary trade regime, and institutional arrangements for coconut development. The Conference drawn on Indian experience and experience of scientists and policy makers of leading producer countries of the world.

The objective of the Conference was to help Kerala learn from the best practices in the world with respect to industrial applications to coconut, and coconut production itself. Kerala need to formulate a strategy for the sustained growth path with respect to production and productivity of coconut as well as value addition in the coconut industry.

The Conference tried to evolve a sustainable and integrated development model for coconut cultivation and coconut-based industry in the State, by means of enhanced productivity, diversified value-added products, and market opportunities.

The Exposition offered a platform for processors, manufacturers, suppliers, fabricators, and entrepreneurs to showcase their products and services. It was served as a Business-to-Business (B2B) Meet for local buyers and national and international buyers, processors, and suppliers.

Together, the Exposition and the Conference have provided a platform for interaction between farmers, scientists, industrial entrepreneurs, producers' organisations, and Government to meet and discuss new technologies, best practices, research results, current market trends, and opportunities for primary production and value addition.

The conference discussed mainly on Sustained Development and Inclusive Growth of the Coconut Industry in different countries, Industrial Investment and value addition, prospects for productivity and Profitability in coconut cultivation and the experience sharing by the progressive coconut farmers and entrepreneurs from different parts of Kerala.

VANUATU COCONUT SUMMIT

Mridula K[1]. and Muhartoyo[2]
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Vanuatu Coconut Summit 2019 with the theme "*Coconut for Better Future"* was organised jointly by the Department of Industry of Ministry of Tourism, Trade, Commerce and Ni-Vanuatu Business (MTTIB) in close coordination with Ministry of Agriculture, Livestock, Forestry, Fishery and Biosecurity (MALFFB) at the Vanuatu Agricultural Research and Training Centre (VARTC) in Santo, the coconut export hub of Vanuatu. Under the project "Fostering green exports through voluntary sustainability standards", United Nations Conference on Trade and Development (UNCTAD) provided substantive and financial support to the organisation of the Coconut Summit. The summit held from 30th October to 1st November 2019 at SANMA Chiefs Nakamal, Santo.

The objective of the Summit was to bring all the coconut stakeholders together to come up with strategies for making the coconut sector to contribute for sustainable development and better future of Vanuatu. The Summit helped to bring with an agreed outcome that lays out actions needed to make coconut help Vanuatu achieve its national vision, i.e. "Stable, Sustainable and Prosperous Vanuatu."

The Summit was inaugurated by his excellency Mr. Matai Seremaiah Nawalu, Vanuatu Agriculture Minister. The summit attended by State Ministers, Directors, Senior Officials, Producer Cooperatives, Private Sector and coconut farmers. The plenary session mainly covered five sessions on Coconut Industry; Government support to Coconut Industry; Challenges inside the Coconut Industry; Investment Opportunities in coconut Industry and Research and Development Opportunities in coconut Industry.

Mr. Uron N Salum, Executive Director, International Coconut Community attended the Summit and delivered the Keynote address on the occasion.

"This is the first time all the coconut-sector stakeholders - producers, manufacturers, traders, exporters, and relevant government agencies – come together to discuss how to nurture coconut, our "tree of life" – for sustainable future of rural and urban communities in Vanuatu".

The coconut industry contributes significantly to rural incomes and livelihoods as well as foreign exchange and export earnings. However, Vanuatu's coconut sector suffers from low productivity and a high degree of concentration in "brown" copra, the quality of which is considered inferior to white copra using indirect heating system to reduce the moisture in coconut meat. Industry representatives informed the Summit participants that improving

One of the Panelists during the Summit

Coconut Product Exhibition during the Summit

copra quality in Vanuatu could be done very quickly using simple technology. Government agencies could widely disseminate the information and provide training to local producers, they said.

Mr. Uron Salum, Executive Director of International Coconut Community however stated that copra represents only 7 per cent of a potential value one could receive from a coconut. Today, there are over 100 products that are derived not only from coconut meat but also form husks, shells, coconut water, coconut saps, etc. *"The Coconut Summit should come up with strategic recommendations that would enable the country to realize the revenue not earned to date from coconuts"*, Mr. Salum said.

The outcome of the Coconut Summit, which was the Interim evaluation of the implementation of the Vanuatu National Coconut Strategy 2016-2025 was adopted by all the participants, in the presence of Minister of Agriculture (MALFFB), Mr. Matai Seremaiah Nawalu, who confirmed that the Summit outcome would provide substantive inputs to a holistic coconut-sector development policy to be planned and implemented jointly by MALFFB and MTTIB.

For over a century, coconut have been an integral part of the economy of Vanuatu. Recent statistics show that the coconut sector contributes to 45% of Vanuatu's GDP and accounts for over 50% of merchandise exports. Two out of three rural households are engaged in coconut farming, contributing to the livelihood of more than half the rural population for Torba, Sanma, Penama, Malampa and Tafea. To date, Vanuatu's coconut sector has been concentrated in the production of Copra. Expansion in value addition, particularly for smallholder farmers has been a long-term challenge with only few SME producers and enterprises who engaged in virgin coconut oil production. Increasing value addition and product diversification, particularly for smallholder farmers, has been a long-term challenge. Coconut will continue to play a crucial role in meeting Vanuatu's developmental objective to achieve "a stable economy based on equitable, sustainable growth that creates jobs and income earning opportunities accessible to all people in rural and urban areas" by 2030.

PACIFIC WEEK OF AGRICULTURE-SAMOA-2019

Mridula K[1]. and Muhartoyo[2]
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Government of Samoa through the Ministry of Agriculture and Fisheries organised the Second Biennial Pacific Week of Agriculture (PWA) in Apia on the theme "Enhanced partnerships for Sustainable Agriculture and Forestry Systems in the Pacific." Samoa has worked in partnership with the Pacific Community (SPC) and the Food and Agriculture Organization of the United Nations (FAO) to facilitate the PWA from the 30 September - 4 October 2019 at the Tui Atua Tupua Tamasese Efi Conference Centre, Apia. The MAF's annual Agriculture and Fisheries Show also hosted as a main event which was open to the general public from the 2– 4 October 2019 at Malaefatu Park, Sogi.

PWA included the Heads of Agriculture and Forestry Services Meeting from 1 – 2 October, followed by the second joint Ministerial Meeting of the Ministers of Agriculture and Forestry on 4 October 2019. The week provided knowledge sharing platforms through side events hosted around Apia by Regional and International organizations such as Australian Centre for International Agricultural Research, International Coconut Community, Ministry of Agriculture and Livestock of Solomon Island, University of the South Pacific, Pacific Islands Farmers Organisation Network, Pacific Soil Partnership, Technical Centre for Agricultural and Rural Cooperation, International fund for Agricultural Development, Pacific Islands Private Sector Organisation, Development Bank of Samoa.

These side events included some of the following thematic areas: Coconuts for Life-Partnerships for coconut Rescue and Development, Exploring research partnerships for agriculture resilience, Food and Nutritional security in Pacific Island Countries, Pacific Soil Partnership - growing sustainable agriculture in the Pacific, Building Resilience in Pacific Agri-Food/Nutrition Systems towards Regional Alliances for Action, Innovative Financing Mechanisms for Pacific Agribusiness and Value Chain Development, Enhancing Public – Private Producer Partnerships in the Pacific.

All events and activities contributed to the sharing of good practices and successes in overcoming challenges in order to improve agriculture and forestry for Samoa and the other Pacific islands.

Pacific Minister of Agriculture and Forestry

Essential platform to strengthen partnership in agriculture and forestry systems

Honourable Fiame Naomi Mataafa, Acting Prime Minister of the Independent State of Samoa, officially opened the 2nd Biennial Pacific Week of Agriculture, together with the annual Samoa Agriculture and Fisheries Show 2019, in Apia.

The aim of the PWA was to advance sharing of regional agricultural expertise and advice on technologies that will benefit stakeholders and sustain the development of agriculture – from primary or value-added forms, as well as for local food security and consumption.

The Acting Prime Minister emphasised that the key for the region is to stay focused and remain positive in the plans and actions towards healthy, productive and sustainable agriculture, forestry and fisheries in the Blue Pacific, in the support of the regional and country commitments to achieving the 2030 Agenda on Sustainable Development, and the SAMOA Pathway.The Assistant Director-General and Regional Representative for Asia and the Pacific of the Food and Agriculture Organisation, Kundhavi Kadiresan, voiced the World Food Day message for 2019, promoting the elimination of hunger, food insecurity and malnutrition, or SDG number 2 of "Zero Hunger" by the year 2030.,

The PWA encourages all private sector, regional and international organisations, farmers and fishers, and Governments alike to promote sustainable farming and fishing, agroforestry, healthy foods and lifestyles for sustainable development of our social, economic, environmental and cultural existence.

The Pacific Week of Agriculture has brought together Officials and Ministers of Agriculture and Forestry from around the region, through the partnership and collaboration supported and sponsored by the Food and Agriculture Organisation (FAO) and the Pacific Community (SPC), as well as the Government of Samoa through the Ministry of Agriculture and Fisheries, the Ministry of Natural Resources and Environmentthe Ministry of Foreign Affairs and Trade, and the Scientific Research Organisation of Samoa as some of the leading government agencies.

Samoa was selected to host the PWA 2019 by the Pacific Group of Minister Agriculture and Forestry, at the 2017 meeting in Vanuatu. This event demonstrates the Government of Samoa's commitment to further its actions in the "enhancement of partnerships to sustainably develop agriculture and forestry systems in the Pacific."

2nd WORLD COCONUT CONGRESS

Mridula K[1]. and Muhartoyo[2]
[1.] ICC Assistant Director
[2.] ICC Documentalist

Hon. William D. Dar, Secretary, Department of Agriculture, Philippines Delivering His Key Note Address at the 2nd World Coconut Congress in Manila, Philippines

United Coconut Associations of the Philippines (UCAP) organized the 2nd World Coconut Congress on 27-29 August at the SMX Convention Center, Manila. It was attended by more than 500 players, stakeholders and decision makers representing the coconut sector around the world gathered for 3 consecutive days to analyze, share and exchange the latest trends and developments in the industry.

The three day conference had lively discussion among industry players, led by a stellar line up of industry experts from all over the world tackled topics such as: coconut production and value chain, non-traditional coconut products, lauric oleochemicals and new technologies, coconut solutions for health, food, industry & environment, the latest on coconut oil health research, marketing coconut food products: strategies for success, how coconut oil improves blood chemistry, coconut biodiesel.

The Conference was inaugurated by Mr. Dean Lao Jr. Chairman, United Coconut Associations of the Philippines and Keynote address delivered by Hon. William D. Dar, Secretary, Department of Agriculture, Philippines .Mr. Uron N Salum, Executive Director, International Coconut Community, presented the paper on Best Practices in Coconut Farming, Processing and Marketing of Coconut Products in Asia and Pacific Countries. Different speakers from other part of Globe spoke on the occasion.

It was attended by companies, decision makers and professionals in the coconut industry value chain including: coconut producers, suppliers, traders, importers / exporters, millers, manufacturers, processors, equipment and machinery manufacturers, distributors, shippers / logistics providers, policy makers, economists, researchers/

scientists, medical practitioners, nutritionists / food technologists, academicians / educators, trade associations.

The World Coconut Congress 2019 also welcomed the International Coconut Community (ICC) officers and ministers from its member countries who were in the Philippines celebrating ICC's 55th Anniversary.

An exhibition was also arranged to showcase different company to a parade of local and overseas buyers. Offered services, present products for sampling to target market, processing machinery & equipment suppliers, producers of coco sugar, desiccated coconut, coconut water, coconut milk, coconut oil, virgin coconut oil, bio diesel etc., testing & certification services, logistics services, design & packaging services, coconut processors, non-traditional products, trade associations, financial services.

The Congress was an opportunity for the different manufacturers, entrepreneurs, processors and scholars in the coconut sector to exchange their ideas and views with each other and to know the various developments and technologies happening.

A View of the Exhibition during the World Coconut Congress

5TH COCONUT FESTIVAL—BEN TRE PROVINCE-VIETNAM

Mridula K
ICC Assistant Director

Inaugural Ceremony of the 5th Coconut Festival 2019

Ben Tre Province is considered as the coconut capital of Vietnam with coconut planting area of more than 72,000 ha (accounting for 45% of the Vietnam's coconut area). The total annual output reaches over 600 million fruits. The annual export turnover achieves over USD 200 million. Ben Tre Coconut Association has successfully organised the 5th Coconut Festival from 16-20 November 2019 in Ben Tre Province in association with Ministry of Industry and Trade. The theme of the festival was "Coconut Trees on the Way of Integration and Sustainable Development".

During the festival workshops on various topics, exchange of experience, field visit and trade fair were organised. The trade fair started from 14th November with more than 600 booths. The trade fair was organised with the objective to showcase the activities aiming to introduce the potentials and strengths of local speciality products to enhance exchanges of experience in producing and processing coconut products. It would help to open trade opportunities, attracting domestic and foreign investors and at the same time creating unique cultural and tourism aspects which would attract the foreign tourist to this province.

Ben Tre Coconut association invited International Coconut Community and six of the member countries to be part of the festival. Ms. Mridula K., Assistant Director and Mr. Alit Permansah, Market Development Officer of ICC attended the festival, participated in the fair, workshop and experienced exchange program along with the delegation from Indonesia represented by Dr. Jelfina C. Alouw, Head of Collaboration and Dissemination Division of the Indonesian Centre for Estate Crops Research and Development (ICECRD); and Mr. Rusliyanto, Trade Analyst, Ministry of Trade. Mr. Ahmad Sayuti Bin Alias, General Manager, Area Farmer's Association and Mr. Ahmad Bin Ngalim, Principal Research Officer, MARDI representing Malaysia. Thailand delegation was represented by Ms. Sarapee Yuadyong , Managing Director, Chiwadi Products Co. Ltd and Ms. Wilaiwan Twishsri, Senior

Agriculturist from HRI and Sri Lanka delegation was represented by Ms. Withanage Krishani Chathrangi and Ms. Kulappuwa Wadu Kimesha Irangika Silva, Assistant Directors from Ministry of Plantation Industries. One booth in the fair was allotted to ICC to showcase the activities and publications. Chiwadi Products co Ltd of Thailand and Area Farmers Organisation of Malaysia also showcased their products in the fair.

Formal Inauguration of the festival was held on 16th November at An Hoi Park. Mr. Cao Van Trong, Chairman of People's Committee, Ben Tre Province welcomed the invited guests from different local and International organisations, business representatives from inside and outside of the Province and all the local public of the provinces. In his speech he mentioned that it is a great opportunity for the peoples of the Ben Tre province to be part of the festival.

The festival was organised in association with the Department of Culture, Sports and Tourism. Deputy Prime Minister Mr. Truong Hoa BINH who was the Chief Guest of the Festival welcomed all the participants for the festival. He mentioned that it is a great privilege for him to be part of the event. He added that Ben Tre Province is holding the major part of coconut cultivation and many processors are coming forward to develop many value added products. He assured all the support for the development of coconut sector in the Province. He appreciated the activities done by the Coconut Association of Ben Tre Province.

Mr. Truong Hoa BINH, Deputy Prime Minister Delivering his Inaugural Speech

Different cultural performances were presented by the local artists showing the importance of coconut in their daily life. The inaugural program ended with fireworks display.

As part of festival workshops were arranged on 16th and 17th November. On 16th November the workshop was titled "Building Exploiting and Developing Trademarks of Specific Products of Ben Tre Province". The speakers from the government and private sector delivered presentations on different trademark and apps developed for the easy adoption by the farmers, the control of pest and diseases, soil analysis and climate resilient.

The workshop on 17th November was focused on "Value Chain of Coconut Trees". Dr. Jelfina C.

Coconut Product Displayed during the Festival

Alouw presented paper on Coconut value Chain and Market prospects on behalf of the Executive Director, ICC. The workshop was jointly organised by the Ministry of Agriculture, Department of Science and Technology, Ministry of Trade and the People Group Committee of Ben Tre Province. Speakers from the Market Industry Department, Ministry of Resources Development, Science and Technology spoken on the occasion. There was in-depth discussion on market consumption; export and new policies and program developed for coconut processing in the Province.

Exchange of experience meeting was arranged between ICC and delegates from member countries on 18th November 2019 with the major processors and entrepreneurs of Ben Tre Provinces in the campus of Luong Quoi Coconut Co Ltd. This is one of the leading producers of DC, Canned Coconut Milk, Coconut Milk packed in Tetra Pack; canned coconut water; Cold Pressed VCO, refined coconut oil. They are having a production capacity of 600,000 nuts per day. Mr. Cu Van Thanh, Director of the company explained in detail about the activities and informed that their product is sold in the brand name of 'Vietcoco' and doing business in domestic and international markets which includes US, UK, EU, Canada, Australia, Japan. He added that their company maintaining all the Food Safety Management systems and focussing on organic coconut sources to meet strict international standards and has been certified by Control Union.

Mr. Tren Anh Tuan, President of the Coconut Association presented the coconut scenario of the province. It was informed that around 16,000 farmers are depending on coconut for their livelihood. Most of the farmers are small holders. Hardly 2% of the farmers are having big holdings. The delegation was taken around the processing unit and there was a productive interactive session with the entrepreneur's present.

Ms. Mridula K., ICC Assistant Director, presented a set of Publication of ICC to Mr. Cu Van Thanh, Director of Luong Quoi Coconut Co Ltd and Mr. Alit Permansah, ICC Market Development Officer, presented the 50th Anniversary Book on Coconut Journey to Mr. Tren Anh Tuan, president of the Ben Tre Association.

On 19th November the delegates were taken for the field visit to the coconut plantations of Ben Tre province. Mr.Nguyen Trung Chuong, Vice President of the Ben Tre Coconut association and Ms. Ngo Thi Kieu Duong, General Director, Wealth Dragon Cosmetics accompanied the team. She explained the delegates about the different practices followed in the field. It was great experience to know about cultivation practices taken up by the farmers of Ben Tre Provinces. Almost all the farmers have taken intercrops with coconut to increase the income from the plantation. They have planted both dwarf and tall varieties of coconut. The festival concluded on 20th November 2019 with felicitation to the processors participated in the fair.

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT OIL

Dr. Bruce Fife
Certified Nutritionist and Doctor of Naturopathic Medicine, USA

If there was an oil you could use for your daily cooking needs that helped protect you from heart disease, cancer, and other degenerative conditions, improved your digestion, strengthened your immune system, and helped you lose excess weight, would you be interested? This is what coconut oil can do for you. The oil from the coconut is unique in nature and provides many health benefits obtainable from no other source. Coconut oil has been called the healthiest dietary oil on earth. If you are not using coconut oil for your daily cooking and body care needs, you are missing out on one of nature's most amazing health products.

Source: Fife, B. 2004. The Coconut Oil Miracle. Penguin Books (USA.) Inc. New York, USA.)

Walujo Soerjodibroto, MD, Ph.D.
Nutrition Department, Faculty of Medicine, University of Indonesia, Jakarta, Indonesia

The clinical study on the effects of virgin coconut oil (VCO) on immune responses among HIV positive patients in Dhamais Hospital, Jakarta concludes that the macronutrient intake, mostly in terms of energy, fats and protein were significantly improved among the VCO supplemented group. In addition, the weight and nutritional status of the subjects, especially among the VCO supplemented group, were maintained well throughout the study. By maintaining body weight and nutritional status, it is expected to have significant increases in CD 4 concentration because nutritional status is frequently associated with immune status, both humoral and and cell-mediated.

Source: Research Report on the Effects of Virgin Coconut Oil on Immune Responses among HIV Positive Patients in Dharmais Hospital, Jakarta, 2006:21

DR. D.P. Athukorale
Cardiologist, Pharmacologist, Academician, Colombo, Sri Lanka

Coconut milk and coconut oil are consumed by the majority of Sri Lankans and rural people which comprise 70% of our population. They get a significant portion of their calories from coconut. It has been found that the majority of people in the rural areas get about 35 gram of fat per day from coconut and they consume very little food containing fats such as milk, butter, cheese, beef, pork, and corn oil as they cannot afford these expensive dietary items. From our clinical experience, we know that serum cholesterol level of people in rural areas is very low. When we investigate patients with ischaemic heart disease (IHD) from rural areas, we find that their serum cholesterol is normal or low. The commonest risk factor for heart attack in rural areas is smoking.

Coconut has been used in Sri Lanka for over 1000 years but the epidemic of IHD is of recent origin. Before 1950, heart attacks were not common in Sri Lanka.

Source: D.P. Athukorale 1996. The Truth About Coconut Oil. In Facts About Coconut Oil, Jakarta: APCC, pp. 52-54 .

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT OIL

Marry G. Enig, Ph.D.
Director, Nutritional Sciences Division, Enig Associates, Inc.12501 Prosperity Drive, Suite 340, Silver Spring, MD, 20904-1689 USA

The lauric acid in coconut oil is used by the body to make the same disease-fighting fatty acid derivative monolaurin that babies make from the lauric acid they get from their mothers' milk. The monoglyceride monolaurin is the substance that keeps infants from getting viral or bacterial or protozoal infections. Until just recently, this important benefit has been largely overlooked by the medical and nutritional community.

(*Source: Enig, G.M. 2001. Health and Nutritional Benefits from Coconut Oil: an Important Functional Food for the 21st Century. Coconuts Today, Special Edition for the 13th Asian Pacific Congress of Cardiology, October 2-3, 2001, EDSA Shangrila Hotel, Manila, Philippines).*

Dr. Jon J. Kabara
Emeritus Professor, Michigan State University, and Technology Exchange Inc. Galena, Illinois 61036, U.S.A

Never before in the history of man it is so important to emphasize the value of lauric oils. The medium-chain fats in coconut oil are similar to fats in mother's milk and have similar nutriceutical effects. In the past four decades misinformation and disinformation provided by certain politically biased agricultural groups and repeated in professional and lay press have led people to believe that all saturated fats are unhealthy. Little attention is focused on the fact that saturated fatty acids are not single family of fats but comprise three subgroups: short (C2-C6), medium (C8-C12) and long (C14-C24) chain fatty acids. The medium chain fats are found exclusively in lauric oils.

Source: Kabara, J.J. 2000. Nutritional and Health Aspect of Coconut Oil In: Proceedings of the XXXVII COCOTECH Meeting/ ICC 200, 24-28 July 2000, Chennai, India, pp. 101-109) .

Raymond Peat Ph.D.
A lecturer at some universities such as the University of Oregon, Urbana College, Montana State University, National College of Naturopathic Medicine, etc.

Most of the images and metaphors relating to coconut oil and cholesterol that circulate in our culture are false and misleading. I offer a counter-image, which is metaphorical, but it is true in that it relates to lipid peroxidation, which is profoundly important in our bodies. After a bottle of safflower oil has been opened a few times, a few drops that get smeared onto the outside of the bottle begin to get very sticky, and hard to wash off. This property is why it is a valued base for paints and varnishes, but this varnish is chemically closely related to the age pigment that forms "liver spots" on the skin, and similar lesions in the brain, heart, blood vessels, lenses of the eyes, etc. The image of "hard, white saturated coconut oil" isn't relevant to the oil's biological action, but the image of "sticky varnish-like easily oxidized unsaturated seed oils" is highly relevant to their toxicity.

Source: Coconut Oil by Dr. Raymond Peat, http://www.efn.org/%Eraypeat/coconut.rtf

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT OIL

Dr. Conrado Dayrit

Emeritus Professor, University of the Philippines, College of Medicine, Former President, National Academy of Science & Technology, Metro Manila, Philippines

With all the opprobrium cast against it, it bears repeating again and again that noevidence has ever been presented to prove that coconut oil causes coronary heart disease in humans. The human epidemiologic evidence proves that coconut oil is safe. Coconut eating peoples like the Polynesians and Filipinos have low cholesterol, on the average, and very low incidence of heart disease. All evidences now point to inflammation and low HDL as the principal instigators of plaque formation. The chemical properties of coconut oil (CNO) and its biologic actions as a medium chain fatty acid make CNO superior to other oils for cooking and health use. Its anti-inflamatory and immune-regulatory actions as shown by its remarkable control of diabetes, hypertension, heart disease, auto-immune diseases and cancer, make coconut oil unique.

Source: Dayrit, Conrado S. 2006. Coconut Products and Virgin Coconut Oil (VCO) for Health and Nutrition – A strategy for Making Coconut Globally Competitive. In Proceedings of the XLII Cocotech Meeting, 21-25 August 2006, Manila, Philippines.

Vermen M. Verallo-Rowel, M.D.

Award-winning, American Fellow Dermatologist and Medical Researcher based at the Makati Medical Center, Metro Manila, Philippines

The Coconut is the Perfect Health Nut. The coconut can help you avoid obesity, boost your immunity, protect you from bacteria, fungus, and viruses – all while keeping you heart-healthy and moisturizing your skin to a natural glow and beauty, even treating acne, and providing beneficial antiseptic, tumor-protecting, and antioxidant effects.

Source*: Verallo-Rowell, V.M. 2005. RX: Coconuts! (The Perfect Health Nut). Bookman, Inc, Manila, Philippines..*

Prof. B.M. Hedge

M.D. FRCP (London) FRCP (Edinburg), FRCP (Glasgow), FRCPI (Dublin) FACC, FAMS

Little over 50 per cent of coconut oil is medium chain fatty acid, Lauric acid and another 7-10 per cent is medium chain Capric acid. Lauric acid gets converted inside the human system into Monolaurins, the best fat that mother's milk has. Other than mother's milk monolaurins are found only in coconut oil. New born babies and infants depend on the monolaurins for their immune system development and their capacity to withstand any infection. In addition, coconut oil can be digested by the salivary lipase, getting obsorbed very fast to give energy like carbohydrates. All other fats need the pancreatic lipase for digestion that the infants do not have. The coconut oil is the best alternative food fat for the infant when mother's milk is not available. Coconut oil is low calorie fat and as such helps control body weight. Changing the food fat to coconut oil could help reduce weight in obese individuals. It also helps to control blood fat levels in diabetics. Coconut oil's regular use in diet would regularize blood fats and is known to increase the HDL cholesterol fraction while decreasing the LDL and triglycerides significantly; disproving the myth that coconut oil increases cholesterol and triglycerides.

Source: "Coconut Oil-Ideal Fat Next Only to Mother's Milk" in www.bmhegde.com

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT OIL

Naiphinich Kotchabhakdi, Ph.D.
Neuroscience, Research Center, Institute of Molecurlar Bioscience, Mahidol University, Salaya, Nakornpathom 73170, Thailand

Coconut oil is a rich natural source of Medium-Chain Fatty Acids (MCFAs) which contain highest percentage (up to 92%) of saturated fatty acids with 6-12 carbons, such as Caproic or Hexanoic acid (C6:0), Caprylic or Octanoic acid (C8:0), Capric or Decanoic acid (C10:0) and Lauric or Dodecanoic acid (C12:0). These MCFAs usually form esters of glycerol to become Medium-Chain Tryglycerides (MCTs). Like all triglycerides (fats and oils), MCTs are composed of a glycerol backbone and three fatty acids. In the case of MCTs, 2 or 3 of the fatty acid chains attached to glycerol are medium-chain in length. Many recent studies have demonstrated that MCTs can potentially help in the process of burning excess calorie, and thus reducing weight gain and promoting loss. MCTs also promote fat β-oxidation and reduced the need for more food intake. Compared with long-chain fatty acids (LCFAs), MCFAs are substantially different in their chemical and physical properties on metabolism. MCFAs do not seem to require binding to proteins such as fatty-acid binding protein, fatty acid transport protein, and/or fatty acid translocase (FAT, homolog to human CD36). MCFAs are a more preferred source of healthy energy (β-oxidation). Recent studies have shown that MCFAs are usually incorporated into adipose tissue triglycerides, and can influence adipose tissue and other systemic functions more substantially than previously known.

Source: The International Conference on Coconut Oil 17-20 March 2015, Bitec Conference and Exhibition Center, Samut Prakan, Thailand

Dr. Mehmet Cengiz Oz
Director of the Cardiovascular Division, New York Presbyterian Hospital

If you're going to choose just one product to add to your health arsenal, coconut oil may be your best bet. Coconut's chemical compounds make this natural ingredient a powerful tool to solve a whole handful of health issues, including aging, weight balance and infection. Full of antioxidants, this healthy fat is an Oz-approved essential for a healthier you.

Source: *www.coconutresearchcenter.org*

DR. S.M. Sadikot
Hon. Endocrinologist, Jaslok Hospital & Research Center, Bombay. Hon. Diabetologist, All India Institute of Diabetes, Bombay

Ghee, coconut oil and mustard oil are traditional cooking media which have been used in India and other developing countries for thousands of years. Although they are saturated fats, they do not show a wide Omega-6 to Omega-3 fatty acid ratio which is quite high in polyunsaturated oils. The desirable ratio is less than 10:1. Increasing prevalence of diabetes and other related diseases are found correlated with increasing Omega-6 to Omega-3 ratio. On the other hand, consumption of coconut oil which is deficient in polyunsaturated fatty acids has been found to enhance secretion of insulin and utilization of blood glucose. It is beneficial to consume the traditional edible fats such as coconut oil along with polyunsaturated fats to reduce the Omega-6 intake and maintain optimum Omega-6 to Omega-3 ratio in the diet.

Source: Coconut Oil for Health and Nutrition, APCC 2004

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT WATER

Prof. Rabindarjeet Singh
Director, Sport Science Unit, University Science Malaysia

A study on the effectiveness of fresh young coconut water (Malayan Tall Coconut Variety) for whole body rehydration, following exercise-induced dehydration shows that although plasma glucose was high when coconut water was ingested, it was significantly higher with CEB (Carbohydrate-Electrolyte Beverage) due to its higher glucose content. With coconut water having similar rehydration index with same trend for per cent rehydration and restoration of plasma volume with the CEB, it can be concluded that coconut water could be used for whole body rehydration after exercise-induced dehydration. In addition, consumption of coconut water caused less nausea, fullness and no stomach upset and it is also easier to consume larger amount of coconut water when compared with carbohydrate-electrolyte beverage or a sports drink.

Source: Prof. Rabindarjeet Singh, 2009. Coconut Water: A Rehydrating Drink after Exercise Cocoinfo International, 16 (1): 19-20, and in Proceedings, Malaysia National Coconut Conference 2009, Perak, Malaysia

DR. D.P. Athukorale
Cardiologist, Pharmacologist, Academician, Colombo Sri Lanka

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Source: Dr. D.P. Athukorale 2008. Tender Coconut Water – Its Health Benefits Cocoinfo International, 15 July: 14-16

Vermen M. Verallo-Rowel, M.D.
Award-winning, American Fellow Dermatologist and Medical Researcher based at the Makati Medical Center, Metro Manila Philippines

Coconut water contains growth factors that function much like a culture broth and that get used up in the process of growth of the meat. Whether in human beings or in plants, growth factors are produced to regulate growth. These chemicals are very potent. Even tiny amounts produce major growth effects. These plant growth factors have bewitching, Merlin-the-Magician-like names: *gibberelin, auxin*, and *cytokinin*. Each promote growth. One of most studied of the *cytokinins* is *kinetin* which is also found especially abundant in coconut water. Because of its size, the growth factors in the coconut are abundant compared to other nuts in plant kingdom. They are kept in a stable environment (the coconut itself), continue to be active, and withstand the rigors of heat and storage – perhaps because throughout its life the coconut is exposed to the sun and the elements at 30 meters or more above the ground. Kinetin, one of the coconut's growth factors, has been shown to retard the aging of fruit flies and of human cells in culture, and finally, of people using a cream containing kinetin.

Source: Verallo-Rowell, V.M. 2005. RX: Coconuts! (The Perfect Health Nut). Bookman, Inc, Manila, Philippines

EXPERTS' FINDING ON THE HEALTH BENEFITS OF COCONUT WATER

Dr. E.R.H.S.S. Ediriweera
Senior Lecturer, Department of Nidana Chikithsa, Institute of Indegenous Medicine, University of Colombo, Rajagiriya
Sri Lanka

Young coconut water could be drunk to alleviate the burning sensation during micturition. A mix of young coconut water, breast milk, treacle of *Saccharum officinarum* (F.Graminae) and sugar can be used to treat hiccough. Poisoning of *Nerium indicum* (F. Apocyanaceae) can be treated with the juice extracted from pounded leaves of *Dregia volubilis* (F. Asclepiadaceae) mixed with tender nut water. Water of young king coconut (before flesh is formed inside) is given for fever and it can be consumed as a diuretic in dysuria. A King coconut is to be opened by slicing off the top.30 gms of powdered fruits (without seeds), of *Terminalia chebula* (F.Combretaceae) are added to the King coconut water inside and stirred. Sliced top is then replaced (as a cover) and kept outdoors in the dew overnight. Following morning, the mixture inside is to be filtered and drunk as a purgative. This is called El Vireka by Sri Lankan traditional physicians. The number of bowel motions will increase as the person continues to drink cold water from time to time during the morning. He should not consume hot or warm food and liquids. This is good for purifying blood and cooling the body.

Source: Cocoinfo International, Vol. 10, No. 1, 2003

Dr. Eufemio Macalalag
Director of Urology, the Chinese General Hospital, Metro Manila
Philippines

The effectivity of administering coconut water in treating renal disorders and in reducing or dissolving all kinds of kidney stones is proven. The process involved the endoscopic procedure of multiple urethral stenting (MUS) or tubatuin (MUS-T), inserting two to twelve urethral catheters into the kidney ureter and irrigating it with coconut water from seven to nine-month old coconuts or buko nectar concentrate powder (BNCP) for a period of 3-19 days. Daily "bukolysis" and renoclysis with BNCP efffects approximately 10 percent reduction in the size of all types of stones treated. The daily consumption of one mature coconut water, which is equivalent to about two full glasses per nut, could almost guarantee that the formation of stones in the urinary tract would be prevented. The biggest plus factor in "bukolysis" is its capacity to dissolve kidney stones and arrest their growth.

Source: Cocoinfo International, Vol. 18 No. 2, 2011

Dr. Bruce Fife
Certified Nutritionist and Doctor of Naturopathic Medicine, USA

One of the secrets to coconut water's success as a rehydration fluid is its mineral or electrolyte content. Coconut water contains the same major electrolytes as those in human body fluids. It has proven to be a superior rehydration fluid when taken both intravenously and orally.

Today coconut water is used worldwide as a home treatment for dehydration-related diseases such as cholera and influenza. Death rates from cholera are high. Death, however, is not caused by the infection itself, but by dehydration resulting from the loss of body fluids. Giving cholera patients adequate amounts of coconut water results in a remarkable 97 percent recovery rate.

Source: Fife, Bruce Healthy Ways Newsletter, Vol. 4 No. 4, 2007

BEARISH COCONUT OIL MARKET IN THE SECOND HALF OF 2019

Alit Pirmansah
ICC Market Development Officer

Coconut production is estimated to scale down due to insufficient rainfall and stress period of the palms. Preliminary figures from Philippines Statistics Authority showed that coconut production in Philippines during the period of January-September 2019 leveled down to 10.66 million tons or lowered by 0.11% compared to last year's production for the same period. The decrease was attributed to insufficient precipitation during the year. Philippines experienced dryness in several parts of the country in the first five months with average of 74 mm which was equal to only 61% of normal rainfall. Meanwhile, in Indonesia, coconut production in 2019 is also estimated to slide down no more than 1% due to the same reason. Coconut Development Board of India estimated coconut production drops for more than 10%. The decrease in coconut production brings abut copra production to lessen. Production of copra is expected to be below potential primarily during Apr/Aug 2020.

The Oil World predicted that the global copra production in 2019 went down to 4.64 million tons from 4.70 million tons in 2018. The production in 2020 is forecasted to further decline to 4.37 million tons. Both Philippines and Indonesia are expected to have lower copra production in 2019 and 2020. Copra production in Philippines is estimated to lower by 9% to the level of 1.62 million tons this year and 1.45 million tons next year. Meanwhile, copra production in Indonesia is estimated to lower by 5.5% in 2019 and 3.6% in 2020. As a result, coconut oil production is expected to lessen in 2020. However, production of coconut oil is still estimated to increase in 2019 to reach 2.88 million tons utilizing copra stocks from the previous year. Copra crushing in 2019 is expected to increase to 4,628 thousand tons in the period of October 2018 to September 2019 leading to lower stocks in the beginning of 2020.

Figure 1. Global Copra Production, 2011-2020 (Thousand Tons)

Increase in production together with a low price has brought about global export to go up. Global export of coconut oil in 2019 is expected to go up to a level of 1.94 million tons taking advantage of lower price and excess supply. Export of coconut oil from Philippine is expected to level up to 980 thousand tons. Meanwhile, Indonesia is estimated to raise its shipment of the oil globally to a volume of 650 thousand tons in 2019. Latest figure shows that Philippines' export of coconut oil in the period of January-June 2019 was 601,990 tons which increased by 38% compared to 440,346 tons during January-June 2018. In the same period Indonesia sent 318,450 tons to the global market.

Import demand of lauric oils hiked taking advantage of a lower price and an excess supply for the last two years. During October 2018-September 2019, global import of coconut oil estimated to climb by 9.4% from 1.774 million tons during October 2017-September 2018 to 1.941 million tons. At the same time, world import of palm kernel oil jumped form 3.3 million tons to 3.55 million tons. The upsurge was following an increasing trend in preceding years. In 2018 the global import of lauric oils grew by 8.1%.

USDA estimated imports of coconut oil will insignificantly increase in 2019. Latest data from United States Census Bureau showed the imports of both coconut oil and palm kernel oil are even decreasing. During January – October 2019, United States Census Bureau recorded that US imports of coconut oil was 673,638 tons. The import volume was lower by 5.5% against the preceding year's volume for the same period. Import of coconut oil during the period was 388,057 tons which was 5.4% lower than last year's volume. Meanwhile, import of palm kernel oil lessened by 5.6% from 302,618 tons during January – October 2018 to 285,581 tons during 2019.

It is worth noting that there was noticeable shift in demand at the cost of coconut oil due to a wide price premium in the last few years in the US, the largest coconut oil importer. The annual demand dropped in four consecutive years from 561 thousand tons in 2013 to 435 thousand tons in 2017, the lowest volume in the last decade. In the same period, United States Census Bureau recorded that imports of palm kernel oil jumped. The oil rocketed from 374 thousand tons in January -December 2016 to 517 tons in 2017. Imports of palm kernel oil in 2017 was recorded as the highest in the last six years. Hence, share of coconut oil to the US total imports of lauric oils dropped to 45.7% from 58% in the corresponding period of 2016.

In the period of January-August 2019, European countries brought in 650,458 tons of coconut oil and 779,686 tons of palm kernel oil. Hence, total import of lauric oils during the period was 1.4 million tons. The total import volume was higher by 13% compared the previous year's volume for the same period. European countries seemed to take advantage of lower price of the oils.

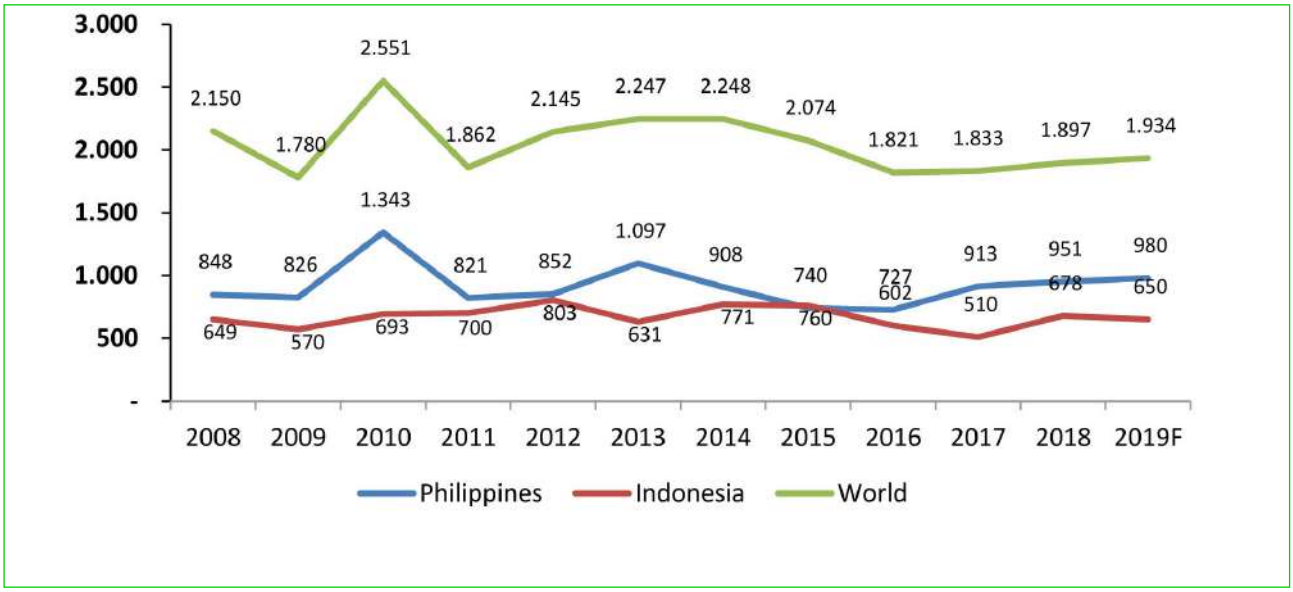


Figure 2. Philippines, Indonesia and World Export of coconut Oil, 2008-2019

MARKET OUTLOOK

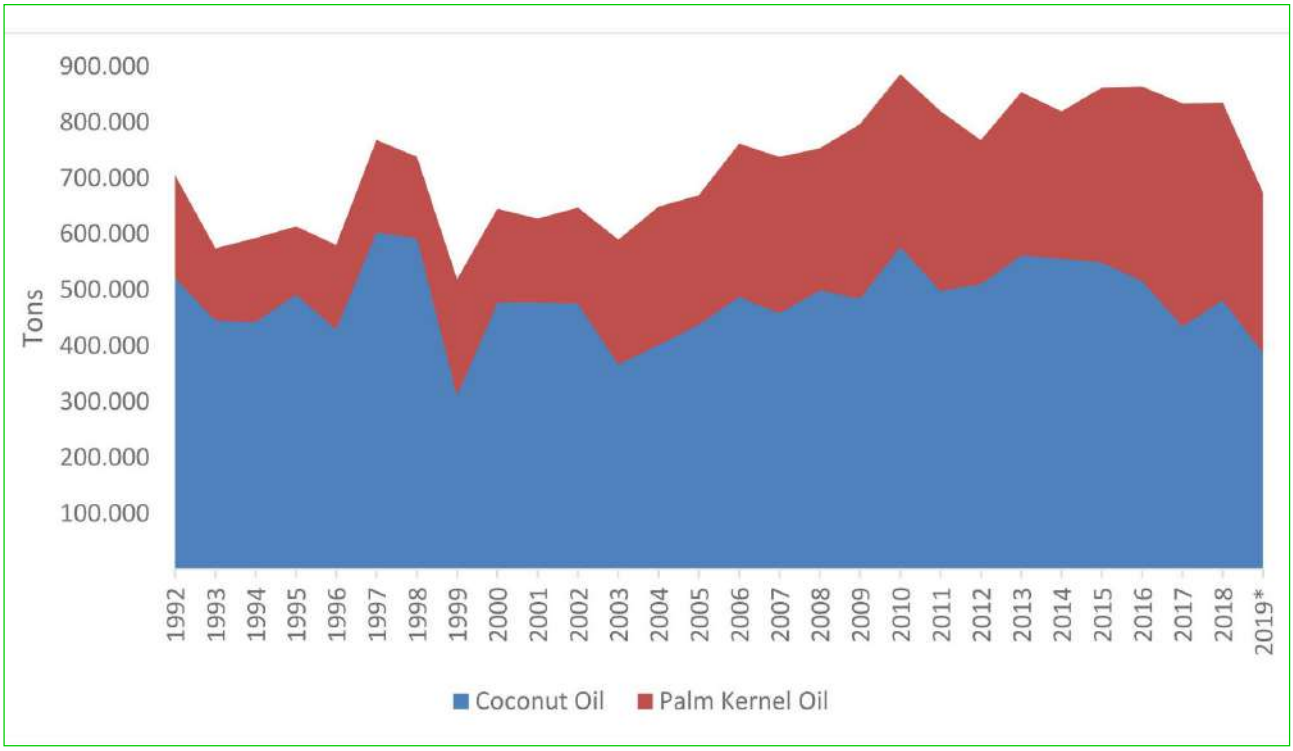


Figure 3. US Imports of Lauric Oils, 1992-2019 (Tons)

Figure 4. Price of Lauric Oils, January 2011 – October 2019, (US$/MT, CIF Rotterdam)

China imports of coconut oil during January-October 2019 was 150,581 tons lower than previous year's volume of 182,971 tons for the same period. Similarly, import of palm kernel oil jumped from 585,334 tons in January-October 2018 to 751,418 tons in January-October 2019. As a result, imports of lauric oils hiked by 17.4%. The increase in imports of lauric oils in 2019 was following the import growth in 2018 maximizing benefit of a low price and excess supply.

MSG SECRETARIAT HOSTS THE EXECUTIVE DIRECTOR OF THE INTERNATIONAL COCONUT COMMUNITY (ICC), 30 OCTOBER 2019.

The Executive Director (ED) of the International Coconut Community (ICC), Mr. Uron Salum paid a short visit to the MSG Secretariat on Thursday 31 October 2019 while on transit in Port Vila after attending Vanuatu's National Coconut Summit held on Wednesday 30 October 2019 in Santo.

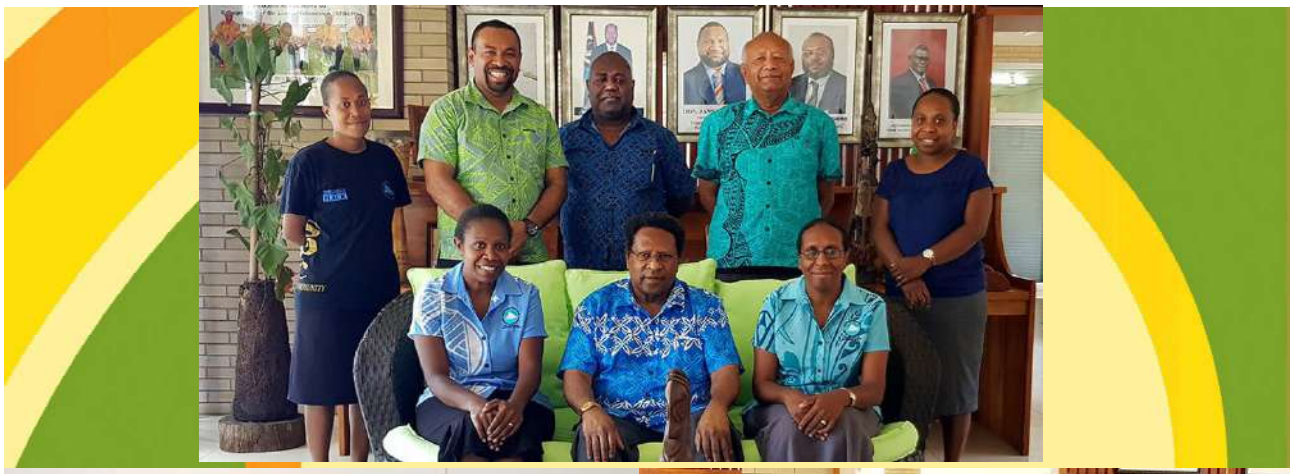
Mr. Romulo Nayacalevu, the Program Manager Governance and Legal Affairs, received Mr. Salum on behalf of the Director General, Ambassador Amena Yauvoli. "We are delighted that ED Salum is visiting us today to strengthen the relationship between our organization. His visit is not that of a guest, he is part of us, the Melanesian family. We are proud of ED Salum's tenure as the head of the International Coconut Community (ICC) and the great advances he has achieved during his tenure. He is the first Pacific Islander to head the ICC, a citizen of PNG and a proud son of Melanesia" Mr. Nayacalevu told staff that had gathered to welcome ED Salum to the MSG Secretariat.

The ICC was established 50 years ago to cater for coconut producing countries under the aegis of the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP). Under the ICC, there are 18 member countries including MSG members Fiji, Papua New Guinea, Solomon Islands and Vanuatu listed that produce over 90 percent of world coconut production and exports of coconut products.

ED Salum is responsible for the MSG membership as a permanent observer to the ICC and has been instrumental in the Secretariat's engagement with the International Coconut Community, making it possible to strengthen the partnership with MSG sub-region members, in turn strengthening this sector of the economy.

ED Salum has been the Executive Director of the ICC for two terms and completes his present tenure in January 2020 when he will pass on the leadership role to his successor, Dr. Alfina who will also be the first female to head the ICC.

The MSG Secretariat prepared a small lunch for ED Salum and presented him with a token of appreciation before he flew out to Brisbane later that afternoon.



3RD INTERNATIONAL COCONUT FESTIVAL, KARANG ASEM, BALI, INDONESIA 14-17 SEPTEMBER 2019

Chairman of the Coconut Producing District Coalition (KOPEK) Nelson Pomalingo officially opened the Karangasem Subak Festival and the 2019 International Coconut Festival which took place at Sukasada Ujung Tourism Park, Karangasem Regency, Bali Province, on Saturday, 14 September 2019. It was attended by representatives from abroad including: Hawaii USA, Tanzania, Hainan China, Australia, India, Sri Lanka, Timor Leste and the Philippines. It was also attended by the Regents who are members of KOPEK, Karangasem Regional Government, Members of Karang Asem Regency Leaders Forum, coconut industry entrepreneurs, representatives from International Coconut Community, as well as farmers engaged in coconut plantations in Indonesia.

In his speech, KOPEK Chairperson Nelson Pomalingo said that coconut is a source of life for the community and the world. Coconut has many benefits from leaves to roots. Even for people in Indonesia, coconut is part of the culture and social life.

Nelson, who is also the Regent of Gorontalo Regency, added that from an economic perspective 98 percent of coconut land is owned by the people, in contrast to oil palm, which is 80 percent owned by the company. "By building coconuts, we build the people's economy," Nelson said. But Nelson complained about the productivity of coconut in Indonesia which is still low. Although Indonesia is a country that has the largest area under coconut in the world with 3.6 million hectares, but in terms of industry it has not developed well.

To overcome this problem, Nelson continued, in 2017 local governments in Indonesia formed a coalition of local governments producing coconut or KOPEK. KOPEK encourages the development of

coconuts by conducting mediation between farmers and entrepreneurs and the government and entrepreneurs.

Currently Nelson said, KOPEK has started cooperation with Tanzania. "We have already discussed a number of things that can be followed up and hopefully tomorrow, the business meetings and national seminars will discussed the development of coconuts in several regions in Indonesia including overseas cooperation," said Nelson .

In this occasion, KOPEK encourages international cooperation to make coconut a tourist commodity. "It's not just an industrial commodity but also a tourist commodity," Nelson said. In this KOPEK meeting a number of agreements were reached namely good agricultural practices on coconuts, encouraging joint research, industries driven from upstream to downstream, as well as developing the potential of coconut handicrafts and trade mechanisms. The opening of the 2019 International Coconut Festival begins with the planting of coconuts by the participants in a location that will become a mini Indonesian coconut garden . (*http://republikpos.com)*

PHILIPPINE COCONUT FARMERS UNDERWENT TRAINING ON NATURAL VINEGAR MAKING

As the government prepares to purge “fake” vinegar from the consumer market, the Department of Agriculture (DA) and the Philippine Coconut Authority (PCA) began a nationwide training of farmers and women’s groups on the production of natural vinegar, using agricultural products to fill the expected supply gap, the Philippine News Agency (PNA) reported on May 22.

Agriculture Secretary Emmanuel “Manny” Piñol, in his FB post, said the DA and the PCA launched on

One of the participants on the Training on Coco Vinegar Production actively participates by raising question

May 28 the "Natural Vinegar Production Program" - with a one-day orientation-workshop - at the Agricultural Training Institute (ATI) in Quezon City. Regional orientation-workshops were conducted after the launching in Quezon City. Invited to attend the first orientation-workshop on natural vinegar production are experts in the field, as well as farmers and entrepreneurs who are already producing vinegar, among them is Green Life Coco Products based in Laguna, which is producing 20-metric tons of organic coco sap vinegar and 60-metric tons of coco water vinegar monthly.

The orientation-workshop included the status of the Philippine coconut industry and the government's thrust to develop other high-value products from coconut; potentials of natural vinegar for household and industrial uses; processing and production of natural vinegar using coconut sap and coconut water. It also introduced the "Acetator" equipment developed by the Department of Science and Technology (DOST), which could process coconut water into vinegar in 16 hours; the DA-PCA program for the establishment of village-level processing facilities for household and industrial vinegar; and the DA-ACPC (Agricultural Credit Policy Council) Loaning Program for Agricultural Production to include production of household and industrial vinegar .

Vinegar-making is a traditional source of income for many coconut farmers in the country but it has reportedly been ignored and neglected by the government in the past. With the consumers now getting more health-conscious and opting for healthy food, Piñol said the production of natural and organic vinegar has a huge market potential provided that the production process, including the packaging, is improved with government assistance. *(UCAP Bulletin)*

WORKSHOP ON PLANT HEALTH MANAGEMENT OF COCONUT, HYDERABAD, 14-15 MACH 2019

Coconut Development Board in association with NIPHM, Hyderabad conducted a National level workshop on Plant Health Management of Coconut, Challenges and Future opportunities on 14th and 15th March 2019 at NIPHM, Hyderabad . Coconut farmers can get better yield and income if they follow recommended practices for coconut plantation and plant health, said Smt. Usha Rani, IAS, Chairperson, Coconut Development Board. Shewas delivering the inaugural address of the two-day national workshop. She called upon to popularize coconut cultivation as it is a highly remunerative crop with multiple uses. There is immense scope forexport and value addition for the products and by products of the crop she added.

The Director General of the National Institute of Plant Health Management (NIPHM)Smt. G. Jayalakshmi, in her address stated that various invasive pests are limiting the production potential of the coconut crop. Hence, this crop is to be cultivated with the recommended practices for maintaining its health. The deliberations and recommendation of the workshop shall be a beginning to ensure the alignment and refinement of the research outcomes for the benefits of farmers. Ms. Anita Karun, Acting Director, Central Plantation Crops Research Institute, Kasaragod, highlighted the salient research finding of the institute which can be used by the farmers to reduce the cost of cultivation and make the crop profitable.

In his welcome address, Dr G Ravi, Director Plant Health Management (NIPHM), highlighted the objectives of the workshop and appealed to the participants to share their experiences and constructive feedback to come up with concrete recommendations for improvement in the coconut farming. The objective of the programme was to organize a scientific deliberation and discussion on various aspects of challenges and opportunities in Plant Health Management of Coconut. CDB officials, progressive farmers, Agro Industry representatives, members of FPOs, Agro Industry Companies, State Government representatives and Scientists took part in the programme.

REVITALIZATION OF FSM'S COCONUT EXPORT INDUSTRY MAKING 'GREAT PROGRESS'

The development of the Integrated Coconut Processing Facility on Tonoas is making great progress. The project is in line with FSM Petroleum Corp.'s Coconut for Life (C4L) initiative, whose goal to revitalize the Federated States of Micronesia's coconut export industry.

"I understand from the surveys PetroCorps has done throughout all of our islands that the nation has the potential to produce about one million gallons of coconut oil for export annually," FSM President David Panuelo said during his visit to the facility on July 13.

Panuelo's visit was witness to clear evidence of substantial work in the past few months, including the setup of containers, generators, trucks, and whiteboards in offices filled with status updates. Of these recent updates include the application of a remediator to the sludge retention pit and the active implementation of the site's environmental and safety plans.

The President advised that, while overall progress for the facility has been slower than originally anticipated, that the pace at which it has picked up in recent months is a positive development.
Coconut for Life (C4L) seeks to enhance the capacity for the buying, selling, exporting, manufacturing, processing, and distribution of copra and other products from coconut trees in the FSM. New community-based revenue streams are created for the people as opportunities become available for farmers to market coconuts.

Panuelo noted that Tonoas is the site for the copra industry. "This is a place with a lot of agriculture, where people grow [coconut and more] for their own livelihood, [offering farmers the opportunity to sell their coconuts when it's convenient for them] is exactly what we need to develop this region." *(https://www.pacificislandtimes.com)*

FOUR CANDIDATES OF COCONUT VARIETIES OF INDONESIAN AGENCY FOR AGRICULTURL RESEARCH AND DEVELOPMENT (IAARD) TO BE RELEASED AS SUPERIOR VARIETIES

The second stage of the release of plantation crop varieties in 2019 was held during October 16-18, 2019 at the Novotel Hotel, Solo. A total of 19 proposed releases of varieties and clones were presented before the Plantation Plant Variety Release Assessment Team, Directorate of Germination, Directorate General of Plantations, the Ministry of Plantation. Prospective varieties and clones proposed include eight plantation commodities, namely oil palm, coconut, clove, sugar cane, tobacco, abaca, cinnamon and nutmeg. Institution that proposes variety/ clone candidates from the Indonesian Center for Plantation Research and Development, regional governments, plantation companies and universities.

Center for Estate Crop Research and Development (*Puslitbangbun*) which consists of four Research Institutes proposes each commodity mandate. Palm Crops Research Institute (*Balitplama*) proposes coconut, Research Institute for Industrial Crops (*Balitri*) proposes tea, Research Institute for Spice and Medicinal Plant proposes (*Balitro*) cloves, nutmeg and cinnamon, and Research Institute for Sweetener and Fiber (*Balitas*) proposes the commodity of tobacco, sugar cane and abaca. Most of the proposed varieties / clones are in collaboration with local governments and universities.

Balitpalma proposes four prospective coconut varieties, namely *Hengniu* Hybrid Coconut, Local Coconut In from Sula Islands Regency, North Maluku, and the Tall varieties from Tanjung Jabung Barat and Jabung Timur Regencies, Jambi Province. The result of the closed session decided that the four candidate varieties proposed by IAARD were approved to be released as superior varieties with some improvement notes. The approved varieties are: (1) *Hengniu* Hybrid Coconut presented by Prof. Hengky Novarianto, (2) Coconut *in Niu Sua* from Kab. Sula Islands, North Maluku, delivered by Meity Tulalo, SP, MP., (3) Coconut *in Peat* from Tanjung Jabung Barat Regency, Jambi, was presented by Ir. Jeanette Kumaunang, MSc, and *Zabak* Tall from Tanjung Jabung Timur delivered by Ir, Miftahorrachman. All varieties that have been agreed to be released are required to establish a seed garden as a source of seed in the context of providing seeds to support the rejuvenation program and expansion of the plantation area. Hopefully the new superior varieties that have been successfully released can be immediately utilized by stakeholders in the development of plantation crops today. Long live Indonesian Plantation!
(http://balitka.litbang.pertanian.go.id/)

SEVERAL FIRMS EXPRESS INTEREST TO SET UP OLEOCHEMICAL BUSINESSES IN SARAWAK

Several foreign and domestic companies have shown interest in setting up oleochemical-related

businesses in Sarawak, according to Deputy Chief Minister Datuk Amar Awang Tengah Ali Hasan. Awang Tengah, who is also state International Trade and Industry, Industrial Terminal and Entrepreneur Development Minister, said the chemicals, derived from plant or animal fats, have a lot of use for downstream products and it is high time for the state to focus on them as another source of revenue.

"We are inviting investors both domestic and foreign, because we have all these resources and the palm oil industry is growing, there are a few companies who are interested to set up, but it's still at an early stage, but we are really hoping for this to be set up in Sarawak," he told reporters at the Sarawak International Business and Economic Summit held last September 30. *(UCAP Bulletin)*

PHILIPPINE ANTI-TRUST BODY PARTNERS WITH AGRICULTURE DEPT FOR CONSUMER PROTECTION IN AGRI SECTOR

The Philippine Competition Commission (PCC) on Tuesday said it partnered with the Department of Agriculture (DA) to help address "unscrupulous" practices in the agriculture sector that could affect prices and output. The anti-trust body represented by its Chairman Arsenio Balisacan and Agriculture Secretary William Dar signed a memorandum of agreement (MOA) on Tuesday, the PCC said in a statement.

Under the MOA, the two agencies could exchange information involving competition in the agriculture space, the PCC said. Investigative and enforcement support and the creation of fact-finding bodies for inquiries in the agriculture sector can be performed by the said agencies under the deal. "This has been a much-anticipated partnership that puts the PCC and the DA at the forefront of inclusive development and consumer welfare promotion. Cognizant of the DA's role in developing our agriculture sector and the sector's importance in the economy, the PCC is well-suited to assist and support the DA by looking into market conduct that ultimately affect prices and output," Balisacan said. The DA will provide a "competition lens" that will help the PCC prohibit "unscrupulous practices" in agriculture markets, he added. *(UCAP Bulletin)*

VANUATU OFFERED HELP TO DEAL WITH RHINO BEETLE

The Vanuatu government has received offers of international assistance to deal with the ongoing operation to eradicate the invasive Coconut Rhinoceros Beetle, a senior official says.The Director General responsible for biosecurity, Moses Amos, said his Ministry had received offers from New Zealand, Australia, the Philippines and Israel.

The beetle is considered a threat to the country's coconut industry and the government recently extended a state of emergency until 21 October to deal with the infestation. Mr. Amos said the offers of help showed that the international community was aware how the beetle could impact the Vanuatu. *(https://www.newsie.co.nz)*

KOKONUT PACIFIC LAUNCHES NEW COCONUT PRODUCTS

Kokonut Pacific Solomon Islands limited launched three of its new products on Thursday in Honiara. They include Coconut Kefir, Coconut Yoghurt and Coconut *Niubiks*. The coconut Kefir was made of coconut water and bacteria probiotics, the coconut Yoghurt was made of coconut cream and bacteria while coconut Niubiks was made of coconut meat after the cream was removed from it.

The new products were a joint project between the Kokonut Pacific Solomon Islands Limited with Culture Wellness Limited from Australia. It was funded by Australian Aid through the Australian Innovation exchange fund. Speaking at the launching ceremony Kokonut Pacific Managing Director Bob Pollard said the intention behind the products is to improve village livelihood across the Solomon Islands. "Currently we do that through the network of 60 - 70 villages that are producing virgin coconut oil but we realize that there's a real possibility with the coconut water," Pollard said. "So with the partnership of Cultured Wellness, we explored the possibility of using the dry coconut water and make it to a very healthy product called Kefir,'' he added. "The idea of Niubiks is to promote the idea of coconut meal using the coconut meat which can be cooked with rice to make it more nutritional. "So from now on you'll be able to buy Kefir, Yoghurt and Niubiks here in Honiara. "Our program will also try and make these products available at the village communities were the coconut oils are being produced."

Pollard also thanked Cultured Wellness and the Australian Government for funding the experiments of the products. A trial of the products was also done in three villages in three provinces of the 60- 70 villages producing virgin oil. Director of Culture Wellness Kirsty Wirth also shared her experience in working and testing the coconut

water during the launching ceremony. Deputy Australian High Commissioner Sally Anne Vincent thanked Kokonut Pacific Solomon Islands and Culture Wellness for the success in making the products which will have an impact on many lives by improving people's health. (*https://www.solomonstarnews.com)*

CHEERING SRI LANKA COCONUT FARMERS WITH TODDY TAPPING DEVICE

Maker Village in Kerala, India, a start-up incubator, envisages becoming an entrepreneurial hotspot for the world, including Sri Lanka, by introducing a new toddy tapping instrument, top officials say. "The advanced prototyping design and simulation centres can be accessed by makers around the world and our goal is to become the hub for hardware in South Asia and attract companies from Sri Lanka, Philippines, and Vietnam, etc.," Rohan Kalani, COO Maker Village told the Business Times in an interview at Kerala Start-up Mission (KSUM), at their headquarters in Thiruvananthapuram, India last week.

He said that Nava Design, a start-up at Maker Village, has developed a patented technology for an automatic toddy tapping system with the electrically powered tapping devices and an extraction unit. "It's called 'Sapper' and is an automatic coconut palm tapping system developed for tapping toddy. Nava Design is working with a major arrack distillery in Sri Lanka to carry out a pilot test in their coconut farms. The project is estimated to be completed in a span of four months and the success of the pilot could make Nava a game-changer in this industry."

Its founder, Charles Vijay Varghese worked in West Asia for 10 years where seeds of his company were sown. He had registered his company while working as an Assistant Unit Manager at Khimji Ramdas, business conglomerate in Oman. In July 2017, he quit his job and incubated the company in Kerala's Maker Village. "His family has a coconut farm where they have been toddy tapping for years and with the new invention, a coconut tree tapper has to climb up the tree to fix the device on the inflorescence," Mr. Kalani explained. A thin and long pipe connects the device with the tank on the surface, where toddy is collected. Once the device is installed and switched on, a notification is sent to the farm manager, informing him/her of the same, through a mobile application. After installation, the robot sensor finely slices the sap to extract toddy. With the help of vacuum extraction, the tube deposits toddy in the collection tank and every day, on an average, 1.5 litres of toddy can be extracted from a single coconut tree.

A tapper has to climb one coconut tree three times a day for a period of three months during the productive life of a single inflorescence; resulting in climbing 270 times. It is possible to replace these 270 times of climbing with a single climbing through the installation of the electro-mechanical device for toddy extraction and vacuum enabled evacuation.

Maker Village promotes hardware-focused innovation and sets up labs and centres that emphasise on the current trend and emerging technologies of disruptive nature to bring India to the forefront of innovation in these areas and attract the best start-ups and innovators to the facility. *(http://www.sundaytimes.lk)*

VIBRANT VIETNAM COCONUT FESTIVAL 2019 COMPLETED

The fifth Coconut Festival was held on November 14-20 in the Mekong Delta province of Bến Tre, offering a diverse range of cultural, sport and tourism activities. With the theme 'Coconuts on the Way to Integration and Sustainable Development', the festival honours coconut trees and their products, the growers and those who work in the sector.

The festival was organised successfully for the first time in 2009 and has been expanded in scale and quality after four editions, Nguyễn Hữu Lập, Vice Chairman of the provincial People's Committee, said at a press conference on July 31. This year, it featured exhibitions on coconut products and

Vietnam Coconut Products Displayed at the Exhibition Stall

trade fairs, along with a wide range of southern delicacies starring coconut as the main ingredient. Workshops focusing on brand building for Bến Tre coconut was also arranged within the framework of the event.

A key event was the Culture and Tourism Week highlighting Bến Tre as a cradle of coconuts. The activities included a fashion show of coconut costumes, coconut parade and trips to discover Bến Tre Province. "The festival aims to promote coconut products of the province to domestic and foreign visitors, create an opportunity to exchange between farmers and enterprises at home and abroad, and lift the position and value of Vietnamese coconut sector in the world market," said Lập. "Growers have a chance to share experience in coconut cultivation, processing, and consumption. It is hoped to encourage farmers to apply modern technology in cultivation to improve productivity and quality, thus expanding markets and boosting exports."

Bến Tre Province is home to 163,000 households involved in farming 71,000ha of coconut trees – half of the country's coconut-growing land. They produce 800 million coconut fruits and ship about US$200 million worth of coconut products abroad annually. Vietnamese coconut products are exported to about 84 countries and territories worldwide. *(https://vietnamnews.vn).*

COCONUT INDUSTRY VITAL FOR FIJI

The ministry over the years has also provided support through infrastructure development and the provision of technical advisory services to stakeholders

Minister for Agriculture, Rural and Maritime Development and Waterways and Environment Mahendra Reddy has acknowledged the importance of the coconut industry in Fiji. This was during the National Coconut Day celebrations at the Wairiki grounds, in Taveuni yesterday. He said through Crop Extension Services and Research Division, the ministry promoted the overall development of coconut as part of a farming system, while focusing on the rehabilitation of existing fields and plantations.

"During this financial year, the Ministry of Agriculture was allocated a budget of $750,000 for the coconut develop-ment programme," Mr Reddy said. "This is a budget increase of 103 per cent as compared to the 2014 Budget; when the Fijian Government, through the Ministry of Agriculture allocated $370,000 to the coconut development programme."

Furthermore, the Ministry of Agriculture provides sup-port through its research division, with an allocation of $200,000 to the Taveuni Coconut Centre under the 2018/19 Budget. The ministry, over the years, has also provided support through infrastructure development and the provision of technical advisory services to stakeholders. "Government through the Ministry of Agriculture will focus on providing aggressive intervention in the coming 10 years," Mr. Reddy said.

Coconut Day celebration focuses on increasing productiv-ity and product diversification from traditional copra pro-duction to whole-nut processing. The ministry has conducted trainings over the past five years and trained more than 100 participants on whole nut processing. Additionally, these participants were equipped with Virgin Coconut Oil (VCO) producing machines valued at $700,000 (100 sets of equipment at $7000 each) to boost VCO production in their villages and communities. This year's theme for Fiji's Coconut Day Celebration was "Nutrition, Health and Wealth".

"Literally, apart from generating income and alleviating poverty, coconuts help to sustain household food needs and nutrition security," Minister Reddy said. "About 120,000 of our rural population depend on the coconut industry as their main source of food and livelihood." *(https://fijisun.com.fj/2019/03/23/coconut-industry-vital-for-fiji/)*

GHANAIAN COMPANY TURNING COCONUT HUSK INTO USABLE PRODUCTS

Nothing is left to go waste after consuming coconut water and its fruit as Ghanaian companies have found a way in turning the hard husk of coconut into usable materials and artefacts. Coconut fibre mats, coconut fibre board, coconut fibre seedling pots, coconut fibre dish scrub pad, coconut fibre cold pressed bicycle seat, based shoe inner sole pads, foam mattress, packaging container, egg carrier, automobile seat lining, hollow blocks and corrugated roofing sheet are the few products made out of the processed coconut husk.

While husks are often discarded, it has now become raw material for companies such as Eco-

and fiber AgroSystems, Fiber Wealth and other companies in the production of useful products. The challenge faced by Ghana with regards to the proper disposal of coconut husk is now a thing of the past. Also known as coir, the history of using coconut husks to manufacture a variety of natural bio-products goes back thousands of years. Today, it's progressing hand-in-hand with an inclusive model of international development centered on the sustainable local market and business development, job creation and the opening up of new opportunities that could raise the living standards of millions of families living in the tropics.

Danida Alumni Network with funding from the Ministry of Foreign Affairs, Denmark (MFA) Danida Fellowship Centre (DFC) organized a stakeholder forum in Accra on opportunities for managing coconut residue in Accra and Tema. The discussions were centered on how coconut waste as a resource could be turned into a variable venture with key participates being entrepreneurs, coconut sellers and other governmental bodies such as the Accra Metropolitan Assembly (AMA).
Achilles Ali, President and Chief Executive Officer of Eco-fiber AgroSystems said Ghana has the capacity to produce several other products with coconut husk but lacks funding and the capacity in terms of equipment to do more than they could with the over 30,000 tonnes of coconut that is consumed in a day. He, therefore, wants government to help the industry with funding as sustainable jobs are guaranteed. Also, local authorities like A.M.A should also assist them in the collection of the coconut husk from in and around the city. (*https://www.ghanaweb.com/GhanaHomePage/business/Ghanaian-company-turning-coconut-husk-into-usable-products-719230#*

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MINISTER: COCONUT EXPORTS NETTED RM974m IN 2018

Malaysia earned RM974 million from export of coconuts and coconut products last year. Agriculture and Agro-based Industry Minister Datuk Salahuddin Ayub, who disclosed this after officiating a "Gerak Kerja Tanam Kelapa" programme in Kampung Siliau here today, said, meanwhile, the ministry reduced the import quota for coconuts by 38 per cent to enable local produce to compete with imports (coconuts). He said the local coconut industry now was a vital one as it contributed to the socio-economy of the country. However, he said Malaysia still had to import 192,800 tonnes of mature coconuts valued at RM96.4 million last year to meet domestic needs. Also present was Federal Agricultural Marketing Authority director-general Datuk Ahmad Ishak. — *Bernama.*

COCONUT AS NEW SOURCE OF INCOME

Kota Kinabalu: Coconuts can be a new source of income for farmers, said Agriculture and Food Industry Minister Datuk Junz Wong, as demand for coconut seedlings had risen due to the increase in downstream products. Towards this end, he commended the efforts of the Sabah Agriculture Department in the production of high quality seedlings.

"We have to continue such initiatives to cater to the current needs," he said after a visit to the Ulu Dusun Agriculture Research Station, Sandakan. "As such, efforts will be taken so that the Federal Government will provide enough allocation to fund agricultural research and development." Junz reiterated that his ministry aims to achieve 25,000 acres of coconut cultivation to enable a coconut processing factory to be set up in Sabah. During the trip, he visited the research plantation, as well as the tissue culture laboratory and briefed by officials. He also reminded all staff to continue their good cooperation in enhancing food production. The station was established in 1962 and emphasizes on cultivating high quality crop as well as to improve good agricultural practices (GAPs). *(http://www.dailyexpress.com.my/news.cfm NewsID=130166*

Table 1. WORLD Exports of Coconut Oil, 2014 – 2019 (In MT)

Country	2014	2015	2016	2017	2018r	2019F
A. APCC Countries	**1,822,360**	**1,728,076**	**1,548,733**	**1,605,772**	**1,823,859**	**1,837,714**
F.S. Micronesia	0	0	0	87	57	0
Fiji	1,630	1,794	1,779	1,955	3,261	2,700
India	7,067	7,725	29,215	11,726	6,985	7,632
Indonesia	771,419	760,072	602,318	510,352	675,270	650,000
Jamaica	9	3	7	6	2	2
Kenya	612	161	252	55	36	30
Kiribati	3,459	2,461	2,220	1,359	1,851	1,500
Malaysia	187,665	152,091	115,969	102,735	121,914	135,000
Marshall Islands	124	0	1,239	809	2,229	2,000
Papua New Guinea	11,068	18,467	23,866	26,565	22,341	25,000
Philippines	814,206	740,279	726,827	912,632	954,107	980,000
Samoa	1,450	1,020	546	1,098	32	50
Solomon Islands	238	1,163	1,487	5,515	5,670	3,300
Sri Lanka	11,254	22,032	22,679	20,126	19,039	20,000
Tonga	0	1,020	900	900	0	0
Thailand	1,960	15	1,236	1,331	1,266	1,300
Vanuatu	9,208	9,000	654	2,543	1,226	700
Vietnam	991	10,773	17,539	5,978	8,573	8,500
B. Other Countries	**284,947**	**342,894**	**327,780**	**167,349**	**124,151**	**112,600**
TOTAL	**2,107,307**	**2,070,970**	**1,876,513**	**1,773,121**	**1,948,010**	**1,950,314**

	2018		2019									
Products	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
Copra[3]	441	469	478	424	415	428	412	407	398	400	415	395
Coconut Oil	787	806	773	710	682	670	665	637	656	710	717	715
Copra Meal[2]	192	202	203	208	222	197	188	212	224	206	205	204
Desicc. Coconut[2]	1,954	1,993	1,979	1,731	1,720	1,712	1,676	1,690	1,677	1,657	1,628	1,698
Mattress Fiber[1]	241	233	231	197	185	189	187	187	188	153	144	144
Shell Charcoal[2]	353	338	337	335	321	322	321	312	301	293	298	311
Palm Kernel Oil	704	742	765	695	655	636	573	542	555	619	613	594
Palm Oil	475	489	585	603	573	588	563	552	544	586	580	591
Soybean Oil	734	726	748	773	750	734	743	743	748	793	779	771

Sri Lanka (FOB)

Philippines (FOB)
Philippines (domestic)

Table 3. World Oil Balance 2016-2019 (1,000 Tons)

Oil/Year	Oct-Sept 2016/2017	Oct-Sept 2017/2018	Oct-Sept 2018/2019
Palm Oil			
Opening Stocks	10,067	11,559	14,470
Production	66,728	71,971	75,589
Imports	48,259	49,038	52,861
Exports	48,906	49,382	53,030
Disappear	64,590	68,716	75,611
Ending Stocks	11,559	14,470	14,280
Soybean Oil			
Opening Stocks	5,259	5,486	5,867
Production	53,617	56,147	56,503
Imports	11,753	10,800	11,453
Exports	11,724	10,978	11,577
Disappear	53,419	55,588	56,177
Ending Stocks	5,486	5,867	6,070
Groundnut Oil			
Opening Stocks	190	280	300
Production	4,150	4,210	3,730
Imports	250	260	290
Exports	250	270	300
Disappear	4,070	4,170	3,800
Ending Stocks	280	300	230
Sunflower Oil			
Opening Stocks	1,967	2,492	2,391
Production	18,896	18,837	20,011
Imports	10,476	10,110	11,086
Exports	10,681	9.976	11,159
Disappear	18,165	19,072	19,663
Ending Stocks	2,492	2,391	2,667
Rapeseed Oil			
Opening Stocks	4,759	3,529	3,297
Production	24,905	25,581	25,309
Imports	4,558	4,853	4,947
Exports	4,562	4,970	4,945
Disappear	26,131	25,696	25,618
Ending Stocks	3,529	3,297	2,990
Cotton Oil			
Opening Stocks	290	310	380
Production	4,270	4,670	4,680
Imports	130	130	150
Exports	130	130	160
Disappear	4,250	4,600	4,720
Ending Stocks	310	380	330
Palm Kernel Oil			
Opening Stocks	769	888	1,143
Production	7,019	7,603	7,987
Imports	3,139	3,300	3,552
Exports	3,141	3,270	3,560
Disappear	6,899	7,378	7,833
Ending Stocks	888	1,143	1,289
Coconut Oil			
Opening Stocks	345	338	435
Production	2,476	2,754	2,883
Imports	1,643	1,774	1,941
Exports	1,674	1,761	1,934
Disappear	2,452	2,670	2,873
Ending Stocks	338	435	452

Integrated Coconut Processing Company

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COMPLETE DESICCATED COCONUT PROCESSING MACHINERY

EVEREST
VIBRO FLUID BED DRYER
For Coconut Paring Drying and low fat DC

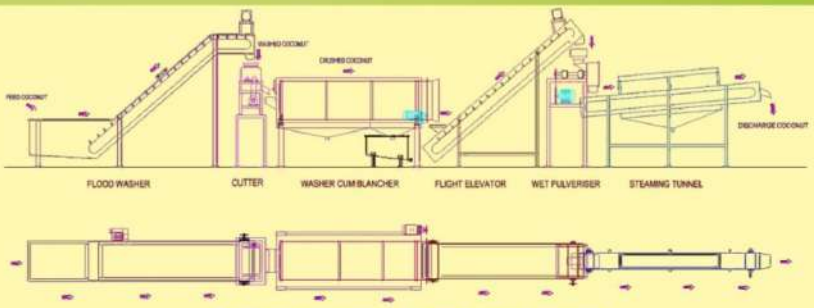
CONQUEST
COMBINATION DRYER
For high fat Grated Coconut

BLAZE
HOT AIR GENERATOR
Heat Generation Capacity :
5 lac - 2 million Kcal

DISINTEGRATOR
Size Reduction Cutter

VIBRO SORTER
SS Multi-Deck Grader

COOLER
Enhances and maintains whiteness of dried product



On-line Coconut Blanching System

We also supply Inter-connecting Screw / Belt Conveyor Systems and equipment for De-husking, De-shelling, Washing, Sterilising, Sieving, Expelling, Storage and Weighment.

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