Global Trends and New Opportunities for the Coconut Industry*

ROMULO N ARANCON JR[1]

Coconut is grown globally over an area of 12.23 million ha producing 11.04 million MT (copra equivalent) in 93 countries in the world. The 15 member countries of the Asian and Pacific Coconut Community (APCC) account for a major share of area and production occupying 10.7 million ha (87%) and 9.2 million MT of copra equivalent (82.81%). Indonesia, Philippines and India are the major producers of coconut in the world.

The area and productivity of coconut are almost at a standstill at the global level during past 5 years (2003-2008). However, there has been an increase in nut production in some APCC member countries. The major coconut products traded in the world market are coconut oil, desiccated coconut, coconut milk, cream and milk powder, shell charcoal, activated carbon, coir and coir products. Meanwhile, tender coconut water as sports drink/energy drink, virgin coconut oil (VCO), coconut flour, and oleo chemicals are some of the emerging products. Nata de coco, coconut vinegar, coconut syrup based products have also entered the international market

In terms of value added products and by-products traded globally, exports in the last 5 years showed an increasing trend especially for coco cream, desiccated coconut, coco chemicals, activated carbon and coir and coir products. The APCC member countries are the main source for the export of copra, desiccated coconut, shell charcoal, coco chemicals and coir products though coconut oil, copra meal and activated carbon are also exported but in small quantities form outside the APCC region.

Opportunities for market expansion for coconut products are seen in the following products: (i) Virgin coconut oil (VCO), (ii) Fresh and tender coconut, (iii) Coconut flour, (iv) Biofuel, oleo chemicals and fatty acids, (v) Desiccated coconut, (vi) Coconut cream, milk and powder, (vii) Nata de coco, (viii) Coconut sap-based products, (ix) Coconut shell charcoal, (x) Coconut activated carbon, (xi) Coconut water vinegar, and (xii) Coir fiber.

A few strategies for coconut development were proposed to meet the above demand: (i) New planting/ replanting of senile palms, (ii) Quality planting materials and low cost input management, (iii) Good agricultural practice and coconut-based farming system, (iv) Transfer of technology and capacity building, (v) Product diversification and value addition, (vi) Product quality improvement and quality standards, (vii) New market and expansion of the market, and (viii) Policy support and investments conducive to industry development and business growth.

Keywords: *Coconut, global trends, products, opportunities, strategies.*

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[1] Executive Director, Asian & Pacific Coconut Community,3rd Floor, Lina Building, Jl. H.R. Rasuna Said Kav. B-7, Kuningan, Jakarta Selatan 12920, Indonesia

Global status of the coconut industry

World Area, Production and Productivity

Coconut is grown globally over an area of 12.23 million ha producing 11.04 million MT (copra equivalent) in 93 countries in the world. The 15 member countries of the Asian and Pacific Coconut Community (APCC) account for a major share of area and production occupying 10.7 million ha (87%) and 9.2 million MT of copra equivalent (82.81%). Indonesia, Philippines and India are the major producers of coconut in the world. The area and productivity of coconut are almost at a standstill at the global level during past five years (2003-2008). However, there has been an increase in nut production in some APCC member countries.

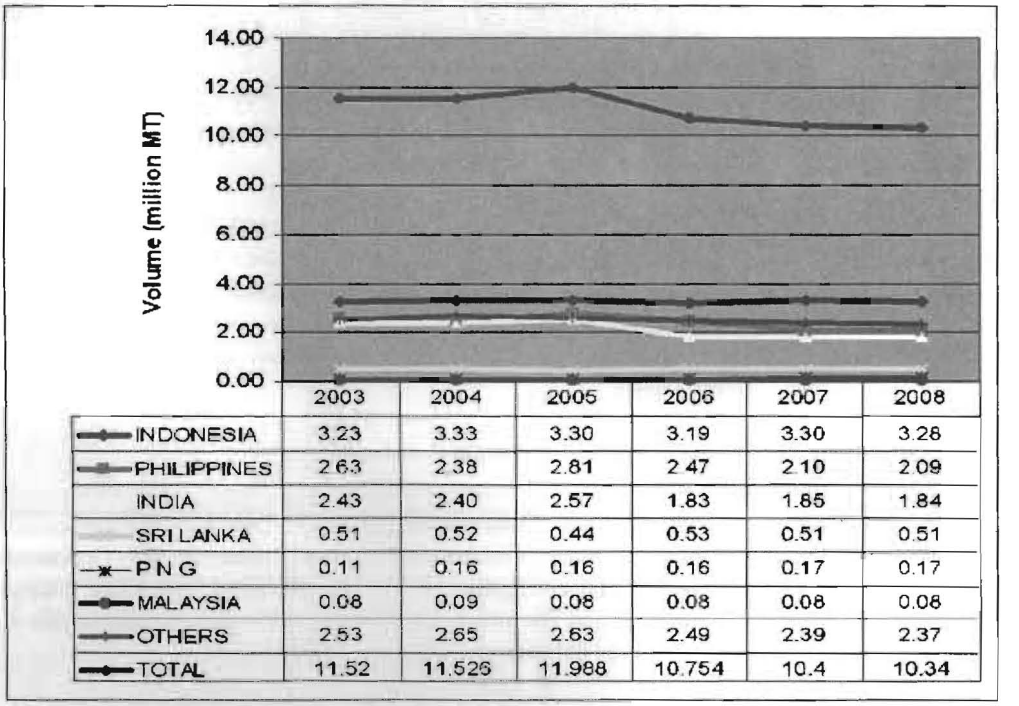
Coconut Production by Country

India had the highest nut production in 2008 by producing 16.769 million nuts by pushing down Indonesia, Philippines and Sri Lanka to 2nd, 3rd and 4th positions respectively. But in term of productivity, Indonesia is the highest by achieving 3.039 million MT copra equivalent followed by the Philippines (2.352 Million MT copra equivalent) and India. Malaysia produced 400 million nuts annually which is 0.8 million MT copra equivalent (*Figure 1*).

Products Traded Globally

There are a number of value added products and by-products of coconut which are traded globally. These are listed below (*Table 1*).

The global exports of coconut products during the last five years showed an increasing



	2003	2004	2005	2006	2007	2008
INDONESIA	3.23	3.33	3.30	3.19	3.30	3.28
PHILIPPINES	2.63	2.38	2.81	2.47	2.10	2.09
INDIA	2.43	2.40	2.57	1.83	1.85	1.84
SRI LANKA	0.51	0.52	0.44	0.53	0.51	0.51
P N G	0.11	0.16	0.16	0.16	0.17	0.17
MALAYSIA	0.08	0.09	0.08	0.08	0.08	0.08
OTHERS	2.53	2.65	2.63	2.49	2.39	2.37
TOTAL	11.52	11.526	11.988	10.754	10.4	10.34

Figure 1 Coconut production in copra equivalent by country in 2003 – 2008
Source: APCC Trade Data

TABLE 1
EXPORTS OF COCONUT PRODUCTS IN 2004-2008

Products	Global exports			APCC exports			% Share of APCC countries	
	2004	2008	Increase/ decrease (%)	2004	2008	Increase/ decrease (%)	2004	2008
Copra (000 MT)	130	132	1.54	85	120	41.18	65.38	90.91
Coconut oil (000 MT)	2,011	1,975	-1.79	1,656	1,715	3.56	82.35	86.84
Copra meal (000 MT)	767	795	3.65	679	755	11.19	88.53	94.97
Desic. coconut (MT)	278	355	27.70	200	284	42.00	71.94	80.00
Coco cream (MT)	28,764	38,500	33.85	27,992	37,372	33.51	97.32	97.07
Coco powder	8,417	7,950	-5.55	5,142	4,788	-6.88	61.09	60.23
Coco chemicals	20,500	91,441[1)]	346.05	20,500	91,441	346.05	100	100
Shell charcoal (MT)	41,467	24,000	-42.12	41,467	20,000	-51.77	100	83.33
Activated carbon (MT)	n.a.	n.a.	n.a.	84,129	110,000	30.75	100	100
Coir & coir products	106,200	451,020	324.69	105,557	403,544	282.30	99.39	89.47

[1)] Phillipines export only [in copra equivalent]
Source: APCC Trade Data

trend particularly coco cream, desiccated coconut, coco chemicals, activated carbon and coir and coir products. There was marginal increase in the export of copra and copra meal and a significant increase in coco chemicals, activated carbon and coir as well as coir products. Coco cream and coco powder have been a major addition in the export basket of coconut products during this period.

The export in APCC countries also showed an increasing trend but there was a decline in the exports of shell charcoal and coco powder. Apart from the recent world financial crisis situation, shortage of raw materials for the processing industry, high domestic price of raw materials, decline of export prices, and increase of the cost of production are some of the factors which affected coconut product exports in the last five years.

The APCC member countries are the main source for the export of almost the entire copra, desiccated coconut, shell charcoal, coco chemicals and coir products. While coconut oil, copra meal and activated carbon are also exported in some quantities from outside the APCC region.

Major Coconut Products

The major coconut products traded in the world market are coconut oil (*Figure 2*), desiccated

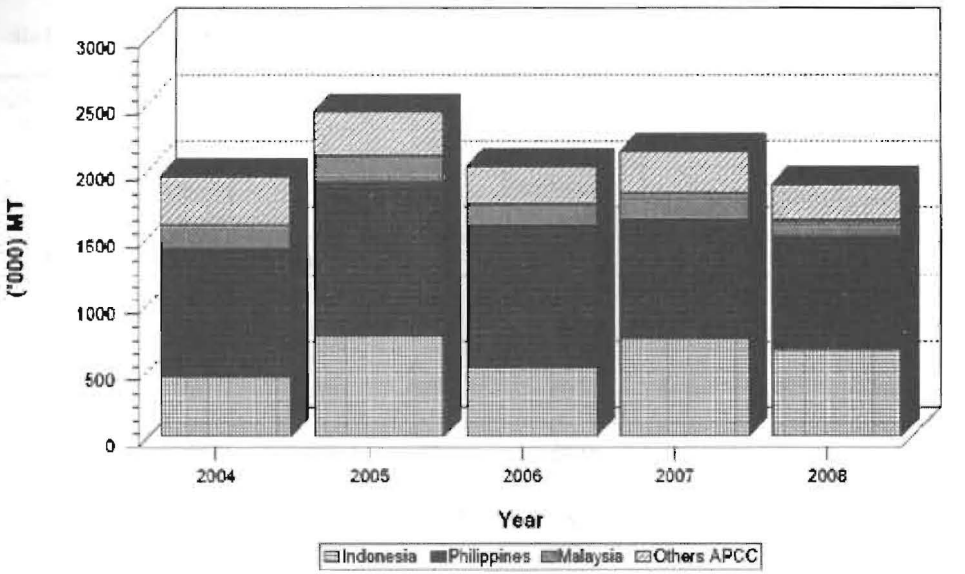


Figure 2 World exports of coconut oil 2004-2008

coconut, coconut milk, cream and milk powder, shell charcoal, activated carbon, coir and coir products. Meanwhile, tender coconut water as sports drink/energy drink, virgin coconut oil (VCO), coconut flour, and oleo chemicals are some of the emerging products. Nata de coco, coconut vinegar, coconut syrup based products have also entered the international market.

Production of CNO and Other Vegetable Oils

World coconut oil production has remained at more or less the same level in the last ten years. The highest recorded production was in 2001 at 3.46 million MT. The average annual coconut oil production in the last decade is 3.10 million MT (*Table 2*).

Coconut oil competes with other sources of fats and oils in the world market. In the last two decades, the volume of oils and fats has risen steadily. In 2008, the total volume of the nine major vegetable oils was 130.7 million MT. Coconut oil was only 2.4 per cent of the total volume and it ranked 8th after palm oil (32.8%), soybean oil (28.1%), rapeseed (15.1%), sunflower oil (8.2%), palm kernel (3.8%), cottonseed (3.8%) peanut (3.4%) and olive oil (2.2%) (*Table 3* and *Figure 3*).

TABLE 2
WORLD COCONUT OIL PRODUCTION, 1999 - 2008

Year	*Production (Million MT)*
1999	2.40
2000	3.24
2001	3.46
2002	3.10
2003	3.27
2004	3.04
2005	3.24
2006	3.10
2007	3.03
2008	3.05
Average	3.10

Source: APCC Trade Data

TABLE 3
WORLD PRODUCTION OF NINE MAJOR VEGETABLE OILS (000MT) CY 1960-2008

Vegetable oils	*1960*	*1970*	*1980*	*1990*	*2000*	*2008*	*% Share*
Palm	1,264	1,742	4,543	11,014	21,874	42,904	32.82
Soybean	3,300	6,477	13,382	16,097	25,541	36,830	28.18
Rapeseed	1,099	1,833	3,478	8,160	14,466	19,774	15.13
Sunflower	1,788	3,491	5,024	7,869	9,700	10,773	8.24
Cotton	2,325	2,503	2,992	3,782	3,864	5,025	3.84
Palm kernel	421	380	547	1,450	2,691	5,010	3.83
Groundnut	2,587	3,044	2,864	3,897	4,560	4,391	3.36
Coconut	*1,949*	*2,020*	*2,717*	*3,387*	*3,281*	*3,067*	*2.35*
Olive	1,339	1,442	1,701	1,855	2,540	2,933	2.24
Total	16,072	22,932	37,248	57,511	88,517	130,707	100.00

Source: APCC/FAO/Oil World

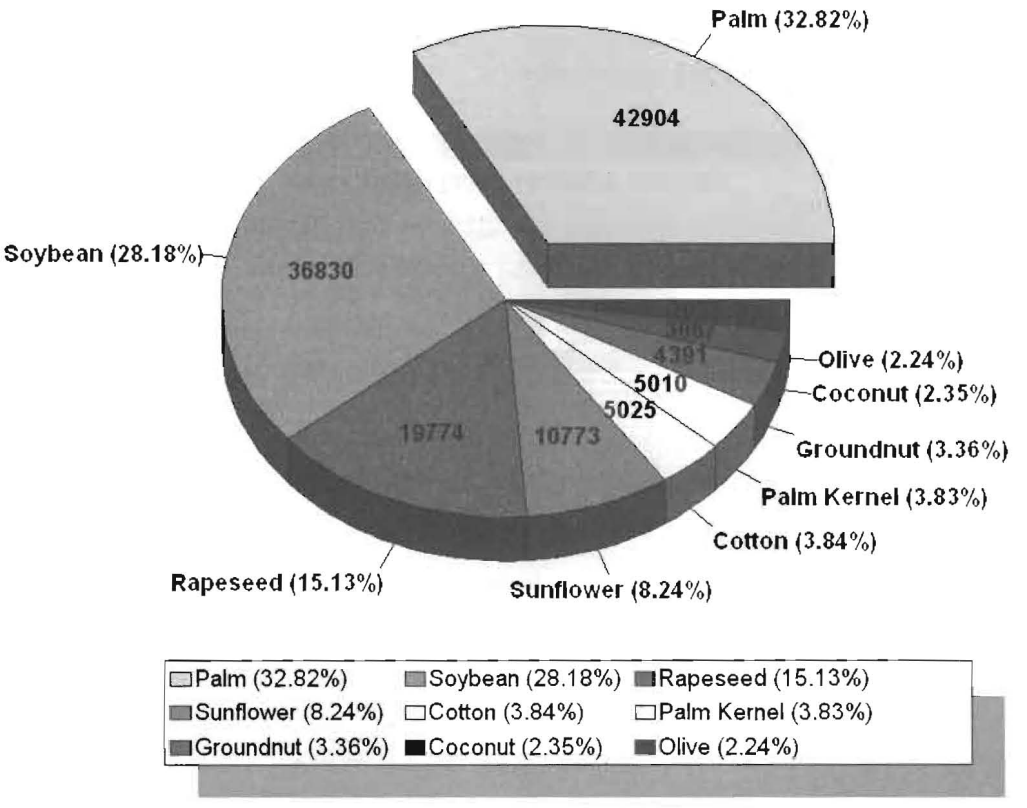


Figure 3 World production of coconut oil vs *other vegetable oils 2008*

Coconut oil faces tough competition with a host of other oils such as soybean, palm, sunflower, rapeseed, olive and corn oil.

Recently, an increasing demand for coconut oil has been seen not only for food uses but also in the oleo chemical and biofuel industry. This demand is primarily based on the chemical properties of coconut oil. In this market, coconut oil competes largely with palm kernel oil (PKO) since both oils have similar chemical composition.

Also, both oils have high lauric fatty acid content which is not present in other vegetable oils. CNO and PKO are therefore unique and normally enjoy a premium. The two oils are the primary sources of lauric oil in the world.

In the last two decades, the production of lauric oil has been on the rise, largely driven by the growth in palm kernel oil. Basically, only three APCC member countries significantly contribute to the world lauric oil trade, *i.e.*, the Philippines in the form of coconut oil, Malaysia with palm kernel oil and Indonesia with both coconut and palm kernel oil. Indonesia is seen as a major player in the lauric oil industry and trade with its increasing production of palm kernel oil.

Coconut Industry Supply Value Chain

The coconut industry has to undertake a deliberate and a focused shift to value-added products like VCO, coconut milk, desiccated coconut, coco methyl ester (CME), geotextile, oleochemicals etc. to increase export income (*Figure 4*).

Coconut Export Products and Export Destinations

Coconut export products from the different APCC member countries are as follows:

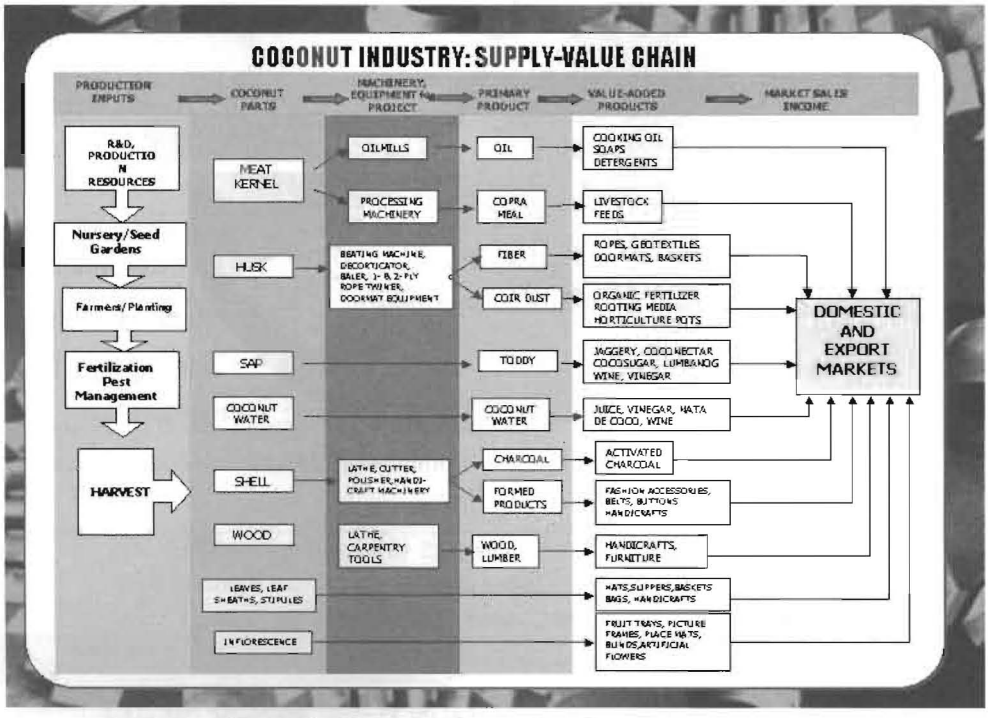


Figure 4 Coconut industry: Supply value chain

Country	Major Coconut Export Products
1. Philippines	Coconut Oil, Desiccated Coconut and CS Charcoal/ Activated Carbon, VCO, Oleo-chemicals and Nata de Coco.
2. Indonesia	Coconut Oil, Desiccated Coconut, Copra and Copra Meal.
3. Sri Lanka	Desiccated Coconut, Fresh Coconut, Coconut Milk, Coconut Powder, Activated Carbon, Mattress and Bristles Fibre.
4. India	Coir Yarn, Coir Matting and Coir Mats.
5. Malaysia	Desiccated Coconut, Fresh Coconut, RBD Coconut Oil, Copra and Activated Carbon.

Major Export Destinations

Coconut products are imported by about 60 countries in all the five continents. The major countries importing coconut products are listed below:

Asia - Pacific:

i) Malaysia : Coconut Oil
ii) Korea : Coconut Oil
iii) China : Coconut Oil, Desiccated Coconut, Coir Products
iv) Singapore : Coconut Oil, Desiccated Coconut
v) Pakistan : Desiccated Coconut
vi) Japan : Coconut Shell, Activated Carbon
vii) Australia : Coconut Shell, Activated Carbon, VCO
viii) United Emirate Arab : Desiccated Coconut, Coconut Water

Europe:

i) Germany : Coconut Oil, Desiccated Coconut, Coir Fibre
ii) United Kingdom : Desiccated Coconut, Coir Fibre
iii) Belgium : Desiccated Coconut, Coir Yarn
iv) Netherlands : Desiccated Coconut, Coconut Oil, Coconut Shell, Activated Carbon
v) Italy : Coconut Shell, Activated Carbon, Coir Yarn, Desiccated Coconut
vi) France : Coir Yarn, Desiccated Coconut

America:

i) Brazil : Desiccated Coconut, Coconut Oil, Virgin Coconut Oil
ii) Canada : Desiccated Coconut
iii) USA : Coconut Oil, Desiccated Coconut, Coconut Shell, Activated Carbon, Coir Yarn

Africa:

i) South Africa : Coconut Shell, Activated Carbon, Desiccated Coconut

Opportunities

Virgin Coconut Oil (VCO)

High value niche market for virgin coconut oil offers a good prospect for the improvement of the income of coconut farmers. VCO can also be produced in macro, micro or village scale of operation. It creates a situation where coconut farmers can directly participate and get a bigger share of the profit of the industry under a fair trade arrangement, instead of just

being a mere producer of copra. The case of a group called "Women in Business" in Samoa is a good example.

The development of the high value market for VCO and VCO-based products also offers a lot more options and flexibility to earn higher income from coconut by using the different process technologies.

The Philippines is the top exporter of virgin coconut oil (VCO) in the world market. Virgin coconut oil export started only in CY2001 with a volume of 1.80 MT. In CY2008, its export volume reached 1,050 MT with a corresponding export value of US$ 3675 million, a phenomenal performance for a newly introduced product both in the domestic and foreign markets. With only the USA as its major foreign market in CY2001, today, it has reached 13 destinations such as the countries in Europe, Asia and Pacific, Middle East and South Africa with an export volume of 1,050 MT (*Table 4*). Thailand, Indonesia, Malaysia, Vietnam, Fiji and Western Samoa are other producing countries.

TABLE 4
THE PHILIPPINE EXPORT OF VCO 2001 - 2008

Year	*Export Quantity (MT)*
2001	2.0
2002	19
2003	103
2004	177
2005	475
2006	461
2007	1,131
2008	1,050*

**Preliminary*

Fresh and Tender Coconut

On the average, the coconut producing countries consume almost 45 per cent of total nut production domestically, as fresh nuts and tender coconut, and about 50 - 55 per cent of total production are used entirely for the processing industry to produce various coconut products.

Tender coconut water (TCW) is the natural isotonic beverage which has almost the same level of electrolyte balance as in our blood. It is the 'fluid of life'. It has a caloric value of 17.4 per 100 gm. According to Ayurveda "It is unctuous, sweet, increases semen, promotes digestion and clears the urinary path". It also contains essential nutrients such as proteins, amino acids, sugars, vitamins and biological growth factors and enzymes that promote anti-aging, healthy cell growth and hydration.

Sugars in the form of glucose and fructose form an important constituent of TCW. The concentration of sugar steadily increases from 1.5 per cent to about 4.4 per cent in the early months of maturation and this slowly falls to about 2 per cent at the stage of full maturity. Sucrose that is a non reducing sugar appears in the late stages and this increases with maturity (*Table 5*).

Fresh young tender coconut and packaged coconut water have become quite popular as an emerging, natural and healthy product. Tender coconut water has gained high popularity especially in the non-traditional markets because of its beneficial properties. Market promotion and quality standards must be sustained to be able to expand the market.

Coconut Flour

Coconut flour is a by-product of the VCO process. It is a food-grade product obtained after drying the residues of VCO or coconut milk expelled/extracted from coconut meat. This defatted fresh coconut meat finely ground into a powder is very similar in consistency to wheat flour.

TABLE 5
ANALYSIS OF MATURE AND TENDER COCONUT WATER

	Mature Coconut Water	*Tender Coconut Water*
Total solids %	5.4	4-6.5
Reducing sugars %	2.0	4.4
Minerals %	0.5	0.6
Protein %	0.1	0.01
Fat %	0.1	0.01
pH	5.2	4.5
Potassium mg %	247.0	290.0
Sodium mg %	48.0	42.0
Calcium mg %	40.0	44.0
Magnesium mg %	15.0	10.0
Phosphorous mg %	6.3	9.2
Iron µg %	79.0	106.0
Copper µg %	26.0	26.0

Coconut flour can be used in baking recipes. It is a delicious, guilt-free and health promoting food as it has high dietary fibre. It can be used in making high-nutritious breakfast bread (20 - 25% blend with wheat flour), cereals and other cookies. The use of locally available coconut flour is indeed a great opportunity for import substitution and savings on foreign exchange.

Biofuel / Oleo Chemicals/ Fatty Acids

In the Philippines, R & D efforts on the development of coconut biodiesel started a few years back initially to stem spiraling prices of petro-diesel and to diversify the product use of coconut oil as a marketing strategy. Research efforts were intensified with the passage of RA 8749 also known as the Clean Air Act. The government embarked on a program utilizing biodiesel for diesel-fueled vehicles. Complementing RA 8749 is RA 2226 or the Bio-Fuels Act. The Bill calls for the mandatory 1 per cent blend of Coco Methyl Ester (CME) with petro diesel mainly in the transport sector of the country.

Last February, the Philippine government has increased the blend to 2 per cent (B2). They are regularly studying to increase the blend to 3 per cent or even 5 per cent to take advantage of low coconut oil prices.

In the coconut industry, oleo chemicals are extracted from coconut oil. The formation of basic oleo chemical substances like fatty acids, Fatty Acid Methyl Esters (FAME), fatty alcohols, fatty amines and glycerol are done by various chemical and enzymatic reactions. Intermediate chemical substances produced from these basic oleo chemical substances include alcohol ethoxylates, alcohol sulfates, alcohol ether sulfates, monoacylglycerols (MAG), diacylglycerols (DAG), structured triacylglycerols (TAG) and sugar esters.

The most common application of oleo chemicals is for biodiesel production. Fatty acids are esterified with an alcohol, commonly methanol to form methyl esters. Another

common application is in the production of detergents. Lauric acid is used to produce sodium lauryl sulfate, the main ingredient in many personal care products. Other applications include the production of lubricants, green solvents, and bioplastics.

Desiccated Coconut

Desiccated coconut (DC) is one of the fully developed coconut products manufactured in the APCC countries. This largest single product made from coconut kernel shows slow but steady growth in the export market (*Table 6*). Today's world demand for DC is 350,000 MT in 2007. Desiccated coconut performance was stable over the five-year period. It has penetrated 106 foreign markets. Among its major markets are the USA, United Kingdom, France, Netherlands, Italy, Australia, Japan and Taiwan.

The total exports of DC have increased several folds from 150,000 MT in 1960 to 350,000 MT in 2008.

More than 60 countries import DC of which more than 60 per cent is absorbed by Western Europe and USA. While there is a slow and steady decline in the share of DC in these countries, market in the countries of the Middle East, Africa, Eastern Europe and Asia has shown an increasing trend for DC.

Coconut Cream/Milk/Powder

Coconut cream/milk and powder have emerged as new popular products of coconut and their exports have increased significantly during 2004 - 2008. Total exports in 2008 reached 38,500 MT and 7,950 MT in respect of coconut cream and powder respectively. Indonesia, Philippines, Sri Lanka, Thailand, Malaysia and India are the producing countries. Indonesia is the leading exporter followed by Sri Lanka, Thailand and Philippines (*Table 7*).

Nata de Coco

Nata de Coco is a white, gelatinous food product. Quality nata is smooth, clear and chewy. It can be sweetened as desserts or candies. It is an excellent ingredient for sweet fruit salads, pickles, fruit cocktails, drinks, ice cream, sherbets and other recipes.

This product is supplied mainly by the Philippines, Indonesia and Malaysia. It is

TABLE 6
DESICCATED COCONUT EXPORTS (2003 - 2008) (000 MT)

Region	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
World	284	278	299	244	334	355
APCC	197	200	221	236	245	284

TABLE 7
EXPORTS OF COCONUT CREAM/POWDER (2004 - 2008)

Coconut Cream (MT)		*Powder (MT)*	
2004	*2008*	*2004*	*2008*
28,764	38,500	6,801	7,950

gaining popularity in the USA, Japan, Taiwan and Korea. During 2004, the Philippines supplied 5,307 MT of this product to 37 countries against 207 MT in 1990.

Processed nata de coco or coconut gel has reached 57 countries in the world market in the past five years.

Coconut Sap Based Products

Coconut sap based products such as coconut sugar/jaggary, beverage, toddy and vinegar are gaining much attention by the consumers mainly due to their beneficial properties. Coco sugar's glycemic index is low at 35 which can be taken both by normal and diabetic patients. Coconut sugar also contains essential vitamins, macro and micronutrients. Most of the producers are small scale and village level operations.

Coconut based alcoholic beverages particularly, coconut arrack, coconut vodka, coco wine, are some of the popular products in the domestic as well as international market. These are high value products which are gaining consumers attraction.

Coconut Shell Charcoal

The Philippines and Sri Lanka continue to be the major suppliers of coconut shell charcoal (*Table 8*). Indonesia's production has come down to 610 MT in 2007 from 35,373 MT in 2003.

Coconut Activated Carbon

Production of coconut shells to charcoal and its subsequent conversion to activated carbon have opened up an avenue for industrial and community level processing for value addition of these by-products. Coconut shell activated carbon is one of the major ingredients used in the purification of drinking water, medicines, sugar and industrial gases. Though activated carbon can be made from various kinds of biomass, coconut shell based activated carbon is reported to be superior in quality and commands a good price in the international market. Shell charcoal forms the best raw material for producing granular activated carbon, an important product for many industries.

The world demand for activated carbon is expected to grow at 5 per cent per year, estimated at 1.2 million tones by 2010. Besides half the demand coming from developed countries, greater growth opportunities are expected to occur in developing markets, primarily the emerging industrial economies of Asia like India and China.

Coconut Water Vinegar

Coconut water vinegar is a natural product resulting from the alcoholic and acetic fermentation of sugar-enriched coconut water. As a non-synthetic food product, coco water vinegar is widely preferred as table seasoning, or as ingredient in food processing.

Coir Fibre

In 2008, the world demand for coir fibre was approximately at 500,000 MT. There are two major types of coir fibre namely brown fibre and white fibre, produced in the world.

TABLE 8
SHELL CHARCOAL EXPORTS (2003 - 2008) (000 MT)

Region	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
APCC	55,842	41,467	30,432	29,792	29,222	24,000

is called for to expand opportunities in existing markets besides identifying new markets. Information on market profile, market access, distribution channels, market opportunities, packaging requirements and prices for each importing country should be provided to all coconut growers, processors and traders. Buyer/seller meetings should be encouraged to provide opportunities to establish new personal contacts. Domestic consumption of coconut products should also be promoted and encouraged.

Policy Support and Investments Conducive to Coconut Industry Development and Business Growth

The APCC member countries should provide coordinated policy environment conducive to coconut industry development and business growth to be competitive in the international market. There is also a need to use collective understanding at the global level to promote international trade and ensure remunerative prices by the APCC member countries.

National governments together with the private sector must invest in coconut industry development. The National Coconut Replanting/Rehabilitation Program and the Coconut Based Farming System Program must be supported by both the central and local governments. The coconut sector must be part of the National Priority Agenda for Development.