THE SUPPLY CHAIN OF COCONUT PRODUCTS IN THE PHILIPPINES IN SUPPORT OF GLOBAL SUSTAINABILITY OF THE COCONUT INDUSTRY

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The Philippine coconut industry in a nutshell

Coconut is the country's no. 1 export earner with record high revenue of $1.957 billion in 2011. Average annual revenue (2009-13) is USD1.508 billion. Against total merchandize exports of the country, coconut oil alone, the industry's major export was no. 10 last year, with no import components unlike the top nine before it. Of gross export receipts from coconut, coconut oil was responsible for USD1.044 billion or 69.5%. In the agriculture sector, three coconut products made it to the top 10 export earners' list namely, coconut oil (1), copra meal (7) and desiccated coconut (9).

Coconut area accounts for around a quarter of the country's total arable land, according to data from the Bureau of Agricultural Statistics. In 2012, total area stood at 3.574 million hectares, a fractional rise from prior year at 3.562 million hectares. Bearing trees population during the year was 344 million, expanding from prior year at 340 million trees. From these trees a total of 15.862 billion nuts were harvested, an increase by 4.0% from year-earlier at 15.245 million MT.

In copra terms, total production in 2013 was 2.710 million MT, exceeding the previous year at 2.633 million MT by 2.9%. For this year, the figure is projected to decline by 11.4% to 2.4 million MT, after two straight years of production growth and the destructive typhoon that leveled coconut areas in parts of Eastern Visayas. Despite the 344 million trees of relatively poor genetics and a good number of senile trees, the coconut industry still is able to deliver the USD1.508 billion in gross export receipts annually.

Various Coconut Products from the Philippines

Meanwhile, as of June last year, data from the Philippine Coconut Authority show there are 69 coconut oil mills in the country with installed crushing capacity of 4.826 million MT copra per year. Refineries number 43 with production capacity of 1.642 million MT of cochin/RBD oil. Oleochemical plants are fewer at 13 with requirement of 250,000 MT of coconut oil. A new sector in biodiesel opened a new market for coconut oil with 9 firms capable of producing 400,000 MT of biodiesel per year. There are currently 11 desiccated coconut plants operating in the country producing 198,479 MT, the equivalent of around 1.6 billion nuts raw material. Likewise, there are 11 activated carbon plants with production capacity of 101,075 MT.

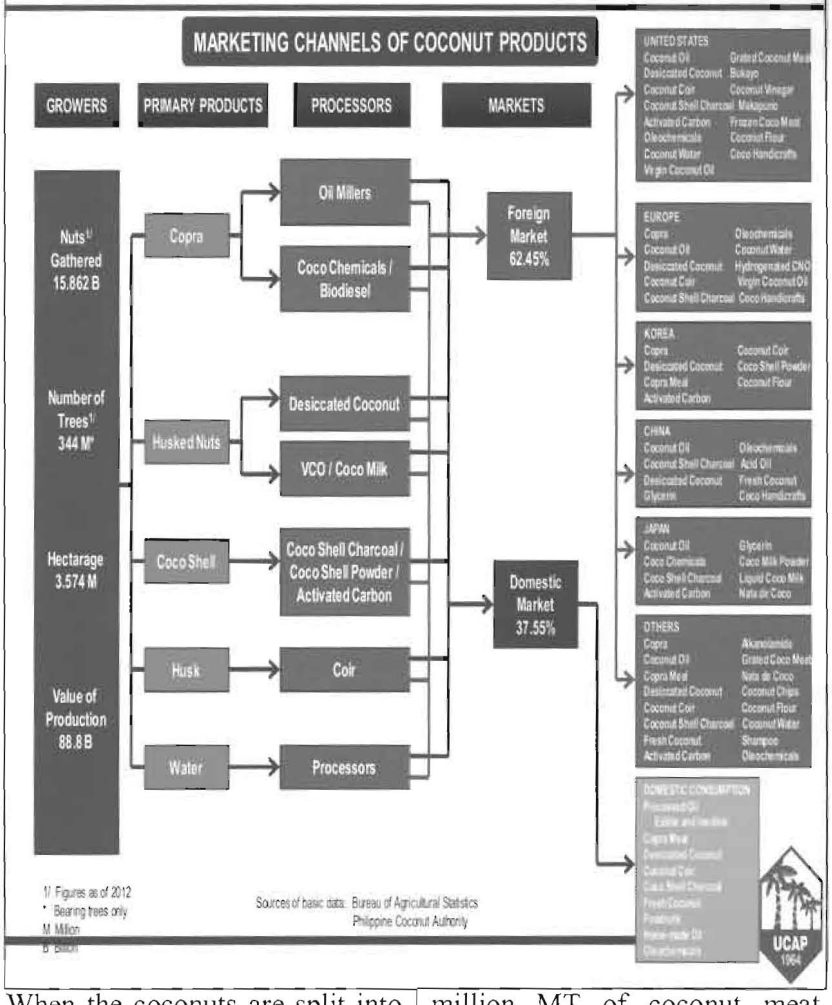
As export oriented industry, it trades around 40 various coconut products and by products to as many as 100 countries around the world. It is estimated that around 70% of the country's coconut harvest goes to the export market.

Given a host of coconut products and by-products, this paper will cover only the major coconut products and by-products export as well as leading non-traditional coconut products exports.

The Philippine Coconut Supply Chain

The agriculture/production stage in the supply chain is mass-based and involves around 3.5 million coconut farmers and farm workers. This part of the chain makes available an average 15.521 billion nuts for processing into various products for local use and export overseas. Data from the Bureau of Agriculture Statistics show value of coconut production at this stage is Php88.8 billion. As the products move farther into the chain, value addition follows.

Chart 1
Marketing Channels of Coconut Products



When the coconuts are split into its various parts at the farm, on the basis of 15.521 billion nuts harvest, potentially 6.208 million MT of coconut husk can be produced, 2.794 million MT of coconut shell, 4.035 million MT of coconut water, and 5.588 million MT of coconut meat. These various parts move into the next level in chain as they become raw materials to different products and in the process new players join the chain as traders, processors, marketers.

Table 1. Export of Coir Products

Average (2009-2013)

Products	Volume (MT)	Value (USD, Million, FOB)	Unit Price (USD, MT, FOB)
Bailed Coir	9,282	2.837	305.65
Coir Twine	1,015	1.754	1,728.08
Pads/ Liners	16	0.021	1,312.15
Coir Nets	19	0.044	2,315.79
Cocopeat	2,445	0.572	233.95
Door Mats	850*	0.002	2.35
Total	13,627**	5.228	

*Square meters
** Excludes doormats

Coconut Husk

In the case of the coconut husks, these are processed into coir fiber, twines, geotextiles, coco logs, and other products. Considered waste, the coco dust which comprise 70% of the husk increase its value after further processing into blocks, pellets, for the horticulture industry. Coir fibers are exported as such or further processed into value-added products like geotextiles/nets for domestic and export markets. The local market for coir and products has been boosted by Memorandum Circular 25 by former President Arroyo, directing all national and local government agencies and other agricultural institutions and councils to use coco peat or coir dust and coconut fiber materials for soil conditioning and erosion control. Likewise, the use of geotextiles and biologs made from coir or coconut fiber has been prescribed for use in infrastructure and public work projects for soil erosion control, more particularly of the Department of Public Works and Highways.

Bailed coir and coir twine are the major exports from this sector. Major buyers of bailed coir are China and Korea.

Coconut Shell

The coconut shell increases its value as it is processed into coconut shell powder for the resins industry, coconut shell charcoal and activated carbon, the latter gets the highest value in this sector due to its important use in various industries like mining, food and beverage, cigarettes, pharmaceutical, medical, among others.

For a while, unprocessed coconut shell from mature nuts was used as raw material for sugar (sorbitol) used as sweetener for bubble gums. The plant had to stop production as it could not

compete with traditional consumers of coconut shell such as charcoal and activated carbon producers.

Japan and China are the major importers of coconut shell charcoal with respective market shares at 43.4% and 26.3%. Average import volume of Japan is 18,092 MT while that of China is 10,958 MT.

Japan also was a primary market for activated carbon with uptake at 7,214 MT responsible for 21.9% of aggregate, followed by Germany at 3,821 MT (11.6%) and the US at 3,529 MT (10.7%). Of the shell products, activated carbon has the highest value.

Coconut Water

Finally, coconut water has joined the supply chain after being considered a waste product from coconut processing especially desiccated coconut production. Coming out in the millions of liters from the plant (at least 1.25 million liters per day at 100% capacity utilization), disposing of coconut water then was costly as this had to undergo treatment before being freed up. The volume is just too much for vinegar production! Even for nata de coco, which normally utilizes coconut milk rather coconut water as raw material. Now it has arrived, propelled by the health craze especially from sports enthusiasts. The situation thus has shifted from being a waste that needed to be promptly eliminated...to where to get more of it to be consumed as health drink.

Coconut Meat

Among the coconut parts, the coconut meat is the most utilized and has moved farthest into the supply chain to support various industries. As a matter of fact, while it accounts for 30% of the coconut, turnover from the meat represents 94.5% of Philippines' aggregate export revenue.

Tender Coconut Water

The coconut meat branches into two different paths in the chain: the fresh meat and copra. In the former, desiccated coconut is a major product, with coconut milk, virgin coconut oil, coconut flour, and other food products as other key products. Virgin coconut oil, however, has an extended chain as new products are developed from it. Bulk of the coconut kernel is processed into copra, comprising about 90% of the fresh coconut supply, from which coconut oil is extracted. Coconut oil is the primary material for various products that include cooking oil, margarine, shortening, oleochemicals, biodiesel produced in the country and exported overseas.

Outlook

This year's Philippine production is anticipated to decline because of typhoon Yolanda last year (Haiyan) and the need for the trees to rest after a stressful two years (2012-13) due to continuous good harvest. This, however, is just a temporary setback. We also did see something positive after Yolanda, in a way, considering that trees destroyed by the typhoon can be replaced by better varieties. Coupled with proper land preparation, more organized planting, and improved farm practices, we can expect better yields from the new plantings.

Presently, the industry has seen the importance of other parts of the coconut as a source of revenue, further increasing the value of the coconut. Coconut water is now a USD9 million export winner (2009-2013 average) with record high turnover of USD19 million in 2011; coir products, USD4 million with high at USD13 million last year.

There has been increasing interest for coconut water as sports drink, not necessarily from green coconuts. Both Coca Cola and Pepsi Cola have joined the bandwagon and have acquired coconut water companies or controlling stakes to increase exposure in this growing non-carbonated drink.

They have good reason to do so. Although we already knew about this based from findings from our researchers, no less than the USDA National Nutrient Database found out in 2006 that coconut water contains an array

of nutrients, including vitamins (B6, folate, thiamin, niacin, panthotenic acid) and minerals (selenium, manganese, copper, zinc, potassium, chlorides, calcium, magnesium, etc., with a modest amount of sodium, natural sugars and protein), and 18 amino acids. Furthermore, consumers are veering away from unhealthy sugar-laden soft drinks and juices in favor of natural products.

Admittedly, in the case of coir and coir products, the Philippines need to learn more from India and Sri Lanka which have highly utilized their coconut husks for high value products including geotextile. As can be seen from earlier Table, in volume terms export of geotextile from the Philippines is still extremely low. It appears that production is mostly absorbed by the local market. However, the high price it commands in the world market would be a major stimulus for export.

Apart from growing markets for other parts of the coconut, non-traditional products also find their way into the market. Virgin coconut oil is one of them. It now generates USD18 million a year and last year hit an all-time high of USD28 million. Volume has been rising uninterruptedly from 1,801 MT in 2009 to 7,061 MT in 2015, powered by health considerations. Lately, its use as a promising dietary intervention especially for people suffering from Alzheimer's disease has been reported.

For non-food applications, it has always been used as ingredient in hair and scalp conditioner, shampoos, in specialty soaps, lip balms, skin creams. As "skin food", it is used as massage oil and body lotion, as body scrub.

Another export winner is the coconut sugar which has been gaining attention from health

VCO Based Soaps

buffs and diabetics because of its low glycemic index. Our producers and distributors of coconut sugar have been very innovative lately. The product now is available in sachets equivalent to one serving, similar to the artificial sweeteners sold in the market.

Fears that coconut toddy tapping might stop the coconut from bearing fruit can now be put to rest. A technology developed at PCA years ago called the sequential toddy and coconut production allows production of coconut sap for sugar processing and harvest of coconuts for copra and other uses.

Coconut flour export shot up last year to its highest level at 1,836 MT, double the 5-year average at 921 MT. Yearly export revenue was USD1.683 million with a high of USD3.663 million in 2013. Its important value in nutrition makes it a highly priced product. From only USD626.71/MT FOB in 2004, prices have never gone down below USD1,000/MT since 2008 and reached an all-time high of USD2,386.56/MT in 2012.

Coconut flour is by-product/solid residue from coconut milk extraction. It is a good source of dietary fiber and can be used as fillers, bulking agent and substitute in products with wheat flour, rice flour, bread flour and other cereal grains up to certain levels. Various applications of coconut flour in bread products have been developed by the Product Development Department of the Philippine Coconut Authority and Dr. Sonia de Leon of the UP-Diliman, College of Home Economics . It has high water absorption properties which results to increase in dough weight, yield of baked products and improved texture.

The Middle East, mainly Jordan and Israel, is major market, followed by Asia & Pacific mainly Korea, and the United States. However, the yearly export performance indicated a shift in export destination away from Jordan and Israel in the Middle East towards Asia since 2009 specifically to Australia, and the US in North America. This could possibly be on account of increasing consumers' health consciouness in these new markets.

Coconut biodiesel (coconut methyl ester) has expanded the use of coconut in the domestic market. This is supported by legislation called the Philippine Biofuels Act of 2006 which remains in effect. From an admixture of 1% biodiesel (B1) in the diesel fuel blend since the law took effect in 2007, this was increased to 2% (B2) in February 2009 and has not been changed since. Thus coconut oil utilization for biodiesel remains at 134,000 MT.

There are still other products with great export potential.

Some people may encourage others to leave coconut farming for some reasons like the vagaries of the weather affecting output as well as low prices at times. But one thing is certain, people will always look up to coconut as a source of livelihood because it is by far the only crop which has never run out of market.

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