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Competitiveness of Coconut Wine Value Chain in the Coconut Industry in Kenya

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Abstract
The coconut palm (cocos nucifera) is known for two main products, i.e. the nuts and coconut wine or toddy. Unlike the other coconut products, coconut wine or toddy production is not driven by the number of coconut trees but by a deliberate business decision by the coconut farmer. The key products under the toddy value chain include fresh wine or coconut juice, fermented wine, coconut sugar, vinegar, etc. The coconut wine value chain in Kenya has been operating under inappropriate policy and institutional and legal framework, especially by classifying it as an illicit brew, despite it not being a brew but rather a harmless and natural coconut palm sap. These legality issues caused low level of toddy value addition business development resulting to insignificant processing capacity for coconut wine. So far, the revenue generated from the coconut wine value chain translates to over 60% of the coconut sub sector value.

Looking at the domestic beer market in Kenya, the current breweries cater for about 60% of it, leaving a whole 40% of the market in the hands of unscrupulous traders who sell health threatening alcoholic drinks that either kill them or make them blind. Scientific research has shown that, the Citrate-phosphate-dextrose solutions (cpds) in coconut wine are propanol, isoamyl, ethanol, butanol and acetic acid. Also, the volatile compounds (vola) levels are less than 600mg/l which is considered the threshold in wine. Coconut wine has no traces of methanol; hence it is very safe to drink. Coconut wine equally meets Kenya Bureau of Standards for Fortified wines, i.e. KS112:2007; Table wines, i.e. KS 05-609:1990 and Sparkling wines, i.e. KS 05-1121:1994. Coconut wine is therefore safe, suitable, and available and has the potential of taking care of the 40% of the Kenyan alcoholic beverages' domestic market if well supported and developed.

Kenya Coconut Development Authority (KCDA) is the leading agent in the promotion and regulation of the coconut industry in Kenya. The Authority has put in place working systems for controlling and managing coconut wine business in consultation with County governments, Public health, Nacada and Kenya Bureau of Standards. It has also developed specific standards for toddy and set special bars called 'Mangwe' for coconut wine. These programmes are aimed at translating the coconut wine value chain into more tangible benefits in terms of direct and better incomes to the majority of Kenyans living within and without the coconut growing areas thus making the toddy value chain even more lucrative. Given this background, this discourse delves into issues, policies and programmes that if considered can propel the toddy value chain to great heights.

Key Words:
Kenya coconut wine value chain; toddy value addition; Kenya Coconut Development Authority (KCDA)

1. Introduction

The government of Kenya recognizes the significant role coconut industry has played in the development of the Coastal areas in Kenya, before and after independence. Coconut is cultivated in Kenya in 6 counties;- Kwale, Kilifi, Mombasa, TanaRiver, Lamu and Taita Taveta. With the exception of Taita Taveta, the other five counties have a high concentration of coconut tree population and have a total coastline of 640 KM of the Indian Ocean. Coconut wine occupies a prime position in the cultural, social and economic lives of the coastal people of Kenya.

Coconut wine provides food and livelihood security and employment opportunities to a major segment of the coastal rural population in Kenya. The coconut wine value chain contributes 60% of the coconut sub-sector value. There is well established coconut wine production clusters in Kilifi, Mombasa and Kwale counties, but less coconut wine business in Lamu, Tana River and parts of Kwale counties where Islamic religion dominates. Notably, even in the districts where the wine production is low, coconut wine still contributes the highest return within the coconut sub-sector productivity.

The progress of the Kenyan coconut wine value chain is constrained due to the low scale of returns at the farm level, traditional tapping techniques and poor promotion and marketing infrastructures. Overall it is clear that coconut wine production is a central part of the livelihoods of most coastal households and will continue to be so in the foreseeable future. Integrating the coconut wine value chain into the market as an important alcoholic beverage will directly affect the livelihoods of many households among coconut growing communities. In

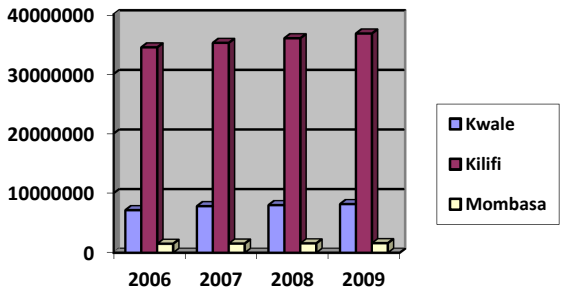
addition, up country communities who suffer health wise due to the consumption of life threatening illicit brews will also benefit. Ignoring the coconut wine value chain will mean wasted opportunity to utilize an important economic base for coastal populations in Kenya.

1.1. Area and Production of coconut wine

According to Agricultural Business Development (ABD) and Ministry of Agriculture (MoA) (2009), the area and production of coconut wine in Kenya was slightly over 200,000 hectares and 34.935 million litres of coconut wine respectively. Compared to the figures of pervious years the area under coconut has increased by 2.49% and coconut wine production increased by 2.2%. by 2010, coconut wine on its own was a KES.2.0 billion industry at the farm gate level with a growth rate of 2.2%. The revenue generate from coconut wine business translated to slightly over 60% of the coconut industry value.

Out of the total 81,347 coconut farmers, 29,285 (36%) were involved in the coconut wine tapping business. In total about 83% of what was being harvested got marketed with the rest comprising of home consumption and postharvest losses ABD/ASPS/CDA (2010). This clearly shows that with high yielding varieties, better farm management and more tapping, the value generated from coconut wine can greatly be enhanced. In addition most coconut wine is sold in its unrefined form as wine processing initiatives are minimal despite its ability to offer avenues for rural employment as a result of enabling projects targeting toddy value added products. Legality issues have for many years classified coconut wine as an illicit or traditional brew, a fact that has contributed to the low level of business development within the coconut wine value chains.

Chart 1: Coconut Wine Production Growth Trends (volumes of Litres).



Source: ABD-DANIDA/CDA. Coconut Value Chain Analysis Report 2010

Table 1: Category of toddy producers and their average production per day.

Category of farmer	Average number of trees tapped	Average toddy production in ltrs	
		High season	Low season
Small scale producer	Below 25	34	16
Medium scale producer	25-50	60	28
Large scale producer	Over 50	90	43

Source: ABD/KCDA: Coconut Value Chain Analysis. 2010

1.1.1. Coconut Wine Marketing

Trends in the Prices of Coconut Wine

The price of coconut wine throughout the year varies with the high and low production seasons. Toddy prices remain constant in the months of December to February, and begin to rise gradually to an all time high of farm gate prices in the months of May and June. Prices are high during the rainy seasons as compared to the dry season. This is mainly because during this period as few coconut trees are tapped due to the wet conditions. Also this is the time when the coconut trees are leafing and flowering. Coconut wine can be used to produce a large number of products such as the alcoholic coconut wine (mnazi), coconut syrup (a non-alcoholic beverage), coconut sugar, vinegar, acetic acid, coconut sap drink and spirits among others.

When toddy is harvested it is normally fresh as the process of fermentation starts later on. Once toddy is harvested its fermentation is a continuous process. Stabilization is required to stabilize the fermentation process so that the required composition in terms of alcohol and acidity is maintained as shown in the table below:

Table 2: Composition of Toddy fermented between 12-24 hours after harvesting

specification	composition
Ash (g/100ml)	0.28
Crude protein (Nx6.25) (g/100ml)	0.22
Crude fat (g/100ml)	0.04
Invert sugar (g/100ml)	1.94
Sucrose (g/100ml)	1.13
Acidity (as acetic acid) (g/100ml)	0.42
Alcohol % (v/v)	5.01

Source: ABD/KCDA: Coconut Value Chain Analysis. 2010

Legality issues that have for many years classified coconut wine as an illicit brew have contributed to the low level of its value chain development. Due to that there has been a low processing capacity for coconut wine. As a result most of it is being consumed unprocessed within the Kenyan coastal region despite the presence of a huge domestic market particularly within the upcountry areas where people drink health threatening illicit drinks. Looking at the beer market in Kenya, the current breweries cater for about 60% of the Kenyan market leaving a whole 40% of the Kenyan market in the hands of unscrupulous traders who sell health threatening alcoholic drinks that either kill or make their clients blind.

The Citrate-phosphate-dextrose solutions (cpds) in coconut wine include propanol, isoamyl, ethanol, butanol and acetic acid. In toddy the volatile compounds (vola) levels are less than 600mg/l which is considered the threshold in wine. Coconut wine has no traces of methanol, hence it is very safe to drink. Coconut wine meets Kenya Bureau of Standards for Fortified wines, i.e. KS112:2007; Table wines, i.e. KS 05-609:1990 and Sparkling wines, i.e. KS 05-1121:1994, Kadere T.T.(2004). Coconut wine is therefore safe, suitable, and available and has the potential of taking care of the 40% of the Kenyan alcoholic beverages' domestic market if well supported and developed.

Table 3: Annual Production and Marketing of Coconut Wine 2009

County	Total farmers	#of farmers in production	Total value of production (750ml bottles)	Percentage of production marketed	Average prices in KES.	Value of production in millions of KES.
Kwale	26201	4479 (17.8%)	18,005,342	83.5%	13.80	248.47
Kilfi	42752	21712 (51%)	86,420,071	86.15%	18.00	1572.37
Lamu	6768	846 (12.5)	539279	100%	20.00	10.79
Tana River	1841	184 (10%)	-	-	-	-
Mombasa	3784	1261 (33.3%)	3,496,267	92.2%	19.00	66.43
Total	81346	28482 (28.4%)	108,460,959	89.6%	17.92	1898.06

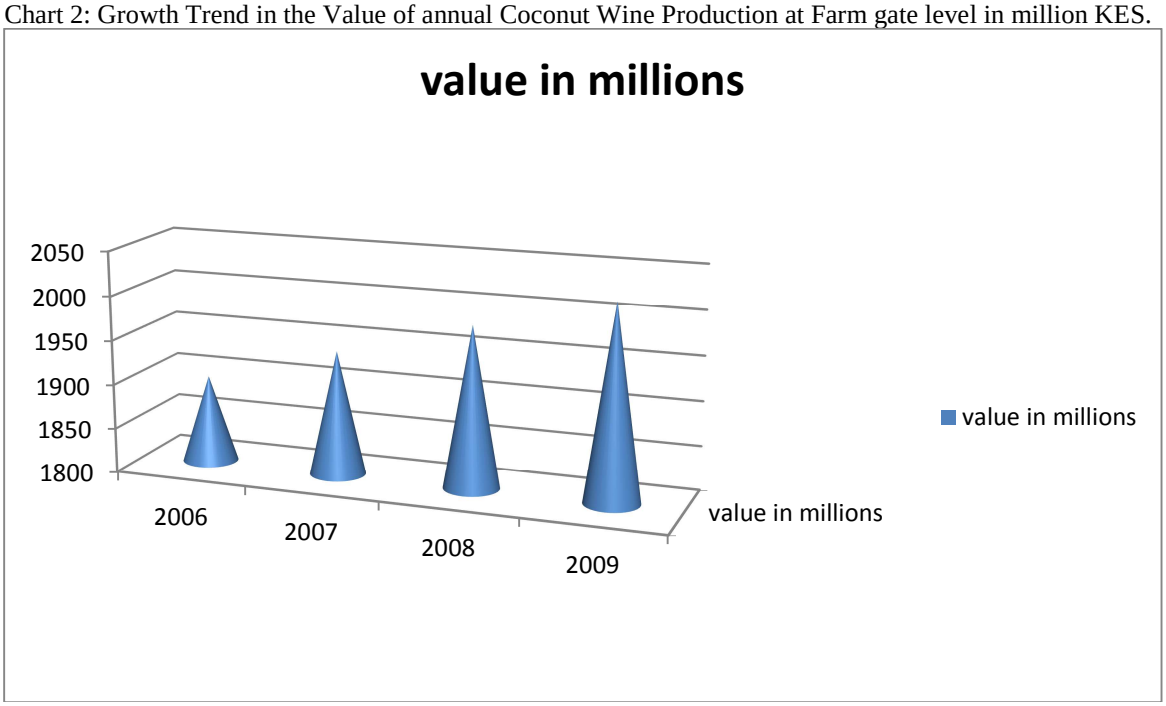
Source: ABD/ASPS/KCDA. Coconut Value Chain Analysis Report 2010

Currently most of the coconut wine consumers are mainly middle and low income earners in the rural and urban areas where its consumed in unrefined form. The preference for toddy over other wines and spirits or malt bottled beer, is mainly due to the fact that coconut wine is cheap, and is sold in convenient volumes and quantities to the buyers. In addition coconut wine is a natural drink without additives, thus being preferred over the industrially brewed alcoholic beverages. It's usually used to grace many cultural occasions.

At the moment a small amount of coconut wine is semi-processed, refined, bottled or packed and sold to middle as well as high income urban consumers. Once processed and packaged the coconut wine is then sold through distributors or agents in various parts of the country. The major retail outlets for these processed products

include hotels, restaurants, bars, supermarkets and malls. There is thus still a big market share for the refined and bottled or packed coconut wine particularly the middle and low income earners both in the urban and rural populations.

Chart 2: Growth Trend in the Value of annual Coconut Wine Production at Farm gate level in million KES.



Source: ABD-DANIDA/CDA. Coconut Value Chain Analysis Report 2010

Accordingly therefore, there is greater room for expansion of the activities within the coconut wine value chain to cater for the subserviced domestic beer market as well as look out for export opportunities, especially within the East African Community, then to the rest of Africa and the world. The coconut wine value chain can also be developed further to produce more commercial products for the local market and the international market. These include vinegar, coconut sugar, coconut honey and spirits which have good market values worldwide. In so doing the coconut growing communities will realize increased incomes, employment opportunities and revenue to the country at large.

The coconut sugar is edible sugar made from fresh coconut sap. The process of producing sugar starts from tapping or collecting of coconut sap. Produced by small scale cottage industries, coconut sugar is essentially used as a sweetening agent in many traditional food preparations and food products mainly used in Asian Pacific countries. The concentration of total sugars in coconut sugar is 80 percent total soluble solids. It is 100% organic, minimally processed, unfiltered and unbleached. Natural sweetener made from coconut syrup contains no preservatives. Coconut sugar is naturally low on glycemic index (GI), which has benefits for weight control and improving glucose and lipid levels in people with diabetes (type 1 and type 2). Coconut sugar produces a slow energy release which sustains the human body through daily activities without regular sugar ‘highs’ and ‘lows’. This potential from the coconut wine value chain is yet to be exploited in Kenya despite it being so lucrative.

Table 4: Composition of Coconut sugar

specifications	Percentages
Sucrose	70-79%
Glucose/fructose	3-9%
Vitamins	B1, B2, B3, B6 and C

Source: ABD/KCDA: Coconut Value Chain Analysis. 2010

1.1.2. Kenya Coconut Development Authority (KCDA)

Kenya Coconut Development Authority was established in 2007, and has been implementing various programmes for improving production and productivity in the coconut sub sector. Since Kenya has been lagging behind in technology development for product diversification and by product utilization, thrusts are being given on technology development and adoption through research. Now Kenya has the potential of having many coconut wine value added products such as:- fresh non-alcoholic coconut wine beverage, coconut syrup, alcoholic coconut wine (mnazi), distilled coconut wine, acetic wine, spirits etc.

Concerted effort of Kenya Coconut Development Authority (KCDA) is expected to bring about perceptible improvements in the area of production and productivity in the coconut wine value chain in the country in the near future. Kenya is now positioned seventh coconut producer in Africa with a very low productivity. Among the pivotal programmes that are being implemented by KCDA for the benefit of the coconut sub-sector include:-

1.1.2.1. Operationalizing Institutional and Legal Framework

The prevalence of legislative inconsistencies in the coconut sub sector is the impediments to the development and growth of the coconut industry. The various pieces of legislation that include, the Agricultural Act, Cap 318, Coconut Preservation Act, Cap 122, the Coconut Industry Act, Cap 331 and the Native Liquor Regulation of November 1900, have not been harmonized giving rise to conflicts during implementation. There is also an absence of strong stakeholder institutions such as farmer cooperatives. Subsequently, the coconut industries that are established close down due to competition from cheap imports. Limited operating and processing standards, hinder the processing of the over 120 possible coconut products and by-products from the coconut tree causing an under exploitation of the coconut potential as the locally processed coconut products and by-products cannot compete favourably both in the local and international markets.

This program is therefore aimed at formulating a policy to govern the production, processing, marketing, exploitation and importation of coconut and coconut based products. Through this program the Authority is to facilitate the formation, strengthening and development of strong and vibrant coconut stakeholder institutions, to provide efficient services among the value chains and make the industry profitable.

1.1.2.2 Strengthening Marketing Systems and Facilitate Market Access

Coconut farmers are the most disorganized category in the agricultural sector. As a result, they are not in a position to reap frm the benefit of most of the programmes implemented by various agencies. They are also unable to raise their voice for premium prices of their very little value added or semi processed coconut products and by-products. The Authority through this program has initiated the establishment of product and market based organizations by organizing the farmers with a view of collectively acquiring agricultural inputs, selling their produce, getting information and disseminating it, or sharing expertise.

The program also aims at developing coconut marketing infrastructure to enable farmers to access markets. Value chain analysis is to be carried out continuously, to identify gaps and technology development in all the stages of the value chains. To exploit the multi-products and uses of coconut products and by products, KCDA's program will train and support farmers and stakeholders in value addition, product diversification, technology improvement and transfer and adoption. Great emphasis is to be placed on diversification, not only to enhance exports and attract additional revenues but also to minimize importation of cheap coconut products and substitutes.

KCDA program is further to introduce initiatives to farmers and other stakeholders such as, liaison with relevant authorities to impose appropriate tariffs on imported coconut products and by-products. By raising the price of coconut based coconut products' imports, local importers will pay better prices for local coconut products. Consequently, an appropriate support tariff will be levied on non processed coconut products to create incentives for value addition and thus increase investment in the coconut sub sector.

1.1.2.3 Increasing Coconut Production and Productivity

Despite the fact that coconut grows well in agro-ecological coastal lowlands (CL), frequent droughts in these zones have been affecting the coconut yields with most trees drying up or tipping off. The unavailability of drought resistant varieties and access to quality planting materials as well as the lack of hybrid varieties, is a major hindrance to growth and productivity in the coconut industry in Kenya.

KCDA program is to increase the area under coconut by encouraging and supporting farmers to grow coconut in underutilized farms. In addition the program is to facilitate the introduction of disease and pest resistant varieties as well as training of farmers on good crop husbandry practices. To ensure that farmers access quality and affordable planting materials, the program is to support existing coconut nurseries and encourage the establishment of new ones. KCDA is working in collaboration with local research institutions on the development of high yielding drought and disease tolerant coconut varieties. The Authority is also collaborating with other international research institutions in leading coconut growing countries like India, Srilanka and Philippines with a view of sharing research findings and technologies so as to increase coconut production and productivity.

1.1.2.4. Facilitating Product and Technology Adaptation and Adoption

The potential of the coconut industry in Kenya remains unexploited, largely due to inadequate, obsolete and inflexible technology. The development and transfer of the low level market research, coupled with low innovation and technology on coconut varietal development, agronomy, product development and marketing has been low. This situation is aggravated further by the low priority accorded to the coconut industry characterized by low research funding. Adoption of appropriate technology and limited incentives, as well as limited coconut processing infrastructure has severely limited industrialization of the coconut industry in Kenya.

KCDA seeks to facilitate the establishment of rural based coconut processing industries to increase the utilization of coconut products at the domestic level and intensify the competitiveness of the coconut industry. In this regard the Authority's program is facilitating the development and acquisition of appropriate value addition infrastructure. It is also collaborating with other stakeholders in supporting business development, product incubation and promotion of innovations. The program is also facilitating awareness creation on the benefits of the range of coconut products at the household and national level.

The main goal of all these programmes is to put in place innovative initiatives in the coconut industry in Kenya to foster:- Production of quality seedlings in the farmers' fields, forming and registering coconut nurseries and their linkages, or avail hybrid coconut seedlings to meet the ever increasing demand for drought/disease tolerant seedlings plus hybrid seedlings; collaborative research through academic institutions, producer/ processing companies, having capabilities and infrastructures in the areas of product development, biotechnology mechanization, plant protection, etc., utilization of coconut wood and women entrepreneurship in coconut sub sector.

More importantly, KCDA programmes are geared to exploiting the coconut potential for processing and marketing of coconut value chains together with the coconut wine to make available a healthy non-alcoholic product to the market, as well as the development and processing of much downstream coconut wine value added products. These innovative programmes are effected in order to bring about the drastic shift from the traditional product mix of copra and coconut oil products so as to strengthen the coconut industry in Kenya.

1.1.2.5. Conclusion

Coconut wine is the best natural safe and sweet alcoholic beverage because the volatile citrate-phosphate-dextrose solutions (cpds) in coconut wine include propanol, isoamyl, ethanol, butanol and acetic acid. Also the volatile compounds levels are less than 600mg/l which is the considered threshold in wine. Coconut wine has no traces of methanol, meets Kenya Bureau of Standards for:- Fortified wines – KS1122:2007, Table wine- KS 05-609:1990 AND Sparkling wine-KS-05-1121:1994. Therefore, coconut wine is very safe and suitable to drink and has the potential of taking care of the 40% of the Kenyan alcoholic beverages' domestic market if well supported and developed.

Additionally, the myriad of products that can be derived from toddy present a lucrative value chain worth considering by any investor.

The Kenya Coconut Development Authority is adopting a multi-pronged strategy for increasing production, encouraging processing and carrying out vigorous market promotion campaigns. It has put in place working systems for controlling and managing of coconut wine industry in consultation with County governments, public health and Kenya Bureau of Standards. KCDA developed specific standards for coconut wine and has set standards for special bars called 'mangwe' for coconut wine.

I believe that in the event that the issues highlighted are addressed the monetary value of toddy will increase more than tenfold. Also, the impact of harnessing the toddy value chain will better;-

- Education of coconut farmers
- Health of the drinkers
- Research undertakings
- Legislations on the coconut sub sector
- Business in totality
- Savings that may accrue to government because of low levels of effects from illicit brews consumption

The effect of these pogrammes is reflected in the improved production, productivity and consumption of coconut wine, increased employment generation and increased incomes to the many people who depend on the coconut wine value chain for their livelihood. The vital program proposed for higher value addition in the coconut wine value chain will not only enable toddy to gain the premier position in being lucrative in the coconut sub sector in Kenya, but also enhance its competitiveness in facing the challenges in the global coconut industry.

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