Sustainable development of coconut processing industry of China

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Abstract: Coconut palm is a perennial tropical economic oil crop, the economic benefit of coconut comprehensive utilization is very high. Every part of coconut is useful in one way or another, coconut meat, coconut water, coconut husk, coconut shell, coconut wood and coconut root can all be processed into relevant coconut products. Coconut producing area and yield in Hainan accounts for 90% total coconut producing area and yield in China. Hainan has been growing coconuts for more than 2,000 years. China has a comprehensive coconut processing industry chain, basically realizing the zero waste of coconut. The processing products include more than 200 types, such as coconut juice, coconut sugar, coconut powder, Nata de Coco, coconut shell activated carbon, coconut palm mattress, coconut bran cultivation media, etc., with an output value of more than 20 billion (RMB). However, there are great challenges of coconut processing industry in China. Coconut raw materials are in short supply and import dependence is high, more processing enterprises, less leading enterprises and coconut products are highly homogeneous, low price competition is serious. So, it needs initiatives of coconut industry in China. We need to coordinate coconut planting and purchasing to ensure raw material supply, establish a product standardization system to ensure the orderly development of the industry, and the industry interaction needs to take intensive and branding development road, and to form combine production, study and research to form a new pattern of product differentiation competition.

1. Comprehensive processing and utilization of coconut

Coconut palm is a perennial tropical economic oil crop, which is also the typical woody oil crop and energy crop in tropical area. Coconut palm is a unique tree and has the reputation of "life tree","jewel tree". The economic benefit of coconut comprehensive utilization is very high. Coconut plays a key role in the economy of tropical area and is regarded as an important way of
helping people to intake protein, fat and energy, helping the farmer to work and get rid of poverty by FAO. Every part of coconut is useful in one way or another, coconut meat, coconut water, coconut husk, coconut shell, coconut wood and coconut root can all be processed into relevant coconut products. The figure 1 indicates the comprehensive usage of coconut. From the figure we can see that the usage of coconut meat is most wide, which can be made into coconut oil, coconut milk, desiccated coconut, dietary fibre, extracting coconut protein, etc. In the main production region of coconut, the coconut water is abandoned, the coconut husk and shell are burned. But in China, the coconut water is made into Nata de Coco, and form a large industry; the coconut husk is made into coconut fibre and cultivate medium, the coconut shell is processed into active carbon. The wood and leaf can be made into artwares, the wood can also be used to build house. The wood is a kind of medicine. The coconut inflorescence sap is a unique tourism product in Hainan, China. So, the comprehensive utilization of coconut is very high and any other crop can not compared with it.

![Coconut palm diagram](image)

**Figure 1. Comprehensive processing and utilization of coconut**

### 2. Coconut planting distribution in China

In China, more than 90 % coconut palms grow in Hainan province. For a long time, coconut has become the symbol, and also the characteristic tourism product of Hainan province. There are also planting of coconut in Yunnan, Guangdong, Guangxi, Taiwan. Coconut planting in Hainan mainly locates in eastern coast. 1. coconut is mainly distributed in Wenchang city, the area is 34% of the
total planting area in Hainan province. Hence, Wenchang has the reputation of "coconut hometown". Next is Qionghai city, the proportion is 15%. In Lingshui, Sanya, Haikou, there are also a small quantity of coconut. 2016, China's coconut harvest area is 321,000 hectares, the output is 307,700 tons; It accounts for 0.27% and 0.51% of the world's total harvest area and output respectively. Hainan has been growing coconuts for more than 2,000 years, the main species is called Local Tall species, supplemented by Wenye 2, 3, 4 and 78 F1 varieties. Over the past five years, the total coconut production of Hainan has remained at more than 220 million.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Coconuts Millions</td>
<td>240</td>
<td>231</td>
<td>238</td>
<td>242</td>
<td>254</td>
<td>253</td>
<td>223</td>
<td>214</td>
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<tr>
<td>year-end area</td>
<td>103 Hectare</td>
<td>42.9</td>
<td>39.2</td>
<td>37.8</td>
<td>37.5</td>
<td>37.6</td>
<td>36.5</td>
<td>35.4</td>
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<tr>
<td>New planting area</td>
<td>Hectare</td>
<td>275</td>
<td>160</td>
<td>160</td>
<td>281</td>
<td>181</td>
<td>129</td>
<td>180</td>
</tr>
<tr>
<td>Harvest area</td>
<td>103 Hectare</td>
<td>24.9</td>
<td>27.4</td>
<td>29.0</td>
<td>29.0</td>
<td>29.8</td>
<td>29.6</td>
<td>28.9</td>
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</tbody>
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NOTE: Hainan statistical yearbook 2017

3. Opportunities of coconut industry in China

China has a comprehensive coconut processing industry chain, basically realizing the zero waste of coconut. The processing products include more than 200 types, such as coconut juice, coconut sugar, coconut powder, Nata de Coco, coconut shell activated carbon, coconut palm mattress, coconut bran cultivation media, etc., with an output value of more than 20 billion (RMB). Well-known enterprises and brand emerged, such as Yeshu, Chunguang, Nanguo, Xingguang, et al. Various coconut products are becoming more and more popular. There are more than 10,000 coconut processing and trading companies worldwide. There are more than 360 kinds of coconut products, including food, medicine and chemical industry. The main trade products are still copra, coconut oil, coconut meal and coconut paste. Other coconut products are also booming: coconut water sales rose by 64% and coconut oil by 122% in the year to March 2016. In company, according to a market report (IRI) of 2012-2016, the United States and Europe of tropical fruit beverage consumption rose by 18%, among them, the coconut beverages market share as high as 23%, was next only to banana (24%). The report (IRI) also noted that coconut flavored bottled water in Europe and the US increased 533% in 2016 (compared with 2011), much faster than other
flavor products such as guava and mango.

Table 2. Consumption of major world coconut products (2011-2015)

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>Units</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>Copra</td>
<td>10³ t</td>
<td>5887</td>
<td>5559</td>
<td>5907</td>
<td>5459</td>
<td>5425</td>
</tr>
<tr>
<td>Coconut oil</td>
<td>10³ t</td>
<td>3646</td>
<td>3541</td>
<td>3758</td>
<td>3431</td>
<td>3299</td>
</tr>
<tr>
<td>Copra meal</td>
<td>10³ t</td>
<td>1806</td>
<td>1746</td>
<td>1789</td>
<td>1648</td>
<td>1681</td>
</tr>
<tr>
<td>Desiccated coconut</td>
<td>10³ t</td>
<td>238</td>
<td>269</td>
<td>254</td>
<td>550</td>
<td>397</td>
</tr>
</tbody>
</table>

**NOTE: STATISTICS FROM APCC**

Due to increasing demands of nutrition and health, plant-based protein drinks have grown at an average annual rate of 28% over the past five years in China, making them the fastest-growing sub-sector of beverages. Currently, the vegetable protein beverage market is about $30 billion, and annual growth is 7%. Companies have predicted that China's vegetable protein beverage market scale will continue to grow. From 2012 to 2016, the overall growth rate of China's vegetable protein beverage market was 6.3%, of which walnut beverage and peanut beverage grew significantly. From the end of 2016 to 2017, the consumption growth rate dropped significantly. Coconut juice beverage market share is China's second largest vegetable protein beverage consumption category, market share of 21.6% in 2015, but from the end of 2016 to 2017, the consumption growth rate dropped significantly.

"Environmental protection" is one of the focuses of the Chinese Government. So, the development of environmental protection material, such as coconut shell activated carbon will have great opportunity. From 2016 to 2017, China's annual production of activated carbon reached more than 500,000 tons, and its export volume reached more than 210,000 tons. It has surpassed the United States, Russia and Japan, ranking the first in the world. The main producers of coconut shell activated carbon are still in the Philippines, Sri Lanka, Indonesia, Malaysia and Thailand. It is predicted that in the next 10-20 years, the demand of coconut shell activated carbon in the field of environmental protection in China alone will be more than 100,000-120,000 tons per year, and the demand of medicine, food and chemical industry will be greater. China's coconut shell resources mostly distribute in Hainan, and the production capacity is far from meeting the market demand.
4. Challenges of coconut processing industry in China

Coconut raw materials are in short supply and import dependence is high. Hainan produces more than 90% of the country's total coconut production, and its planting area is only about 30,200 ha, with an annual output of more than 220 million coconut fruits. Over 1.5 billion coconuts are imported from southeast Asian countries every year, and the import dependence is over 90%. In order to support the development of its domestic coconut processing industry, some countries may not satisfy the demands of the export of coconut fruit.

5. Initiatives of Coconut industry in China

(1) Coordinate coconut planting and purchasing to ensure raw material supply

Good breeding and promotion of good seedlings: To develop new varieties of coconut with high quality, high yield and strong resistance, and to conduct demonstration and promotion jointly with the government. Government and enterprises work together to build a green channel for coconut import: Signing supply and marketing agreements with southeast Asia’s leading coconut producers or establishing coconut trading and storage and transportation bases, establishing green channels for raw materials import. Encourage coconut processing companies to “go out”. Because Hainan has limited arable land available for coconut cultivation, it is necessary that encouraging enterprises to carry out preliminary processing of raw materials in major coconut production areas and serving the national “One Belt And One Road” strategy.

(2) Establish a product standardization system to ensure the orderly development of the industry

Actively promoting the revision of existing standards and the formulation of new product standards and developing fast detection technology and intelligent equipment to ensure product quality.

(3) Industry interaction, take intensive and branding development road

Establish coconut industry association or alliance with leading enterprises; Hold regular meetings on the exchange of enterprise experience and industry problems; We will encourage small and micro businesses to phase out old technologies and equipment and continue to expand and strengthen them.

(4) Combine production, study and research to form a new pattern of product differentiation competition
Taking the government as the bridge to form the interaction mechanism between research institutes and enterprises. Market-oriented development of new differentiated products.