Economic Analysis of Products and Market for Bast Fiber Crops in China

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1. The current situation of China’s bast fiber industry

1) China is one of the biggest countries around the world to produce and plant bast fiber crops.

2) Six kinds of bast fiber have wide commercial prospects in China in many fields: ramie, flax, jute/kenaf, hemp and sisal.

3) In 2011, the bast fiber industry in China brought the commercial value more than 110 billion RMB.
1.1 Plant situation

Table 1: Area and output of bast fiber crops in China

<table>
<thead>
<tr>
<th>Year</th>
<th>Acreage (10,000 hectares)</th>
<th>Output (10,000 tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ramie</td>
<td>Linen</td>
</tr>
<tr>
<td>2005</td>
<td>13.20</td>
<td>15.77</td>
</tr>
<tr>
<td>2006</td>
<td>14.18</td>
<td>8.66</td>
</tr>
<tr>
<td>2008</td>
<td>12.60</td>
<td>5.67</td>
</tr>
<tr>
<td>2009</td>
<td>12.20</td>
<td>1.77</td>
</tr>
<tr>
<td>2010</td>
<td>9.81</td>
<td>0.87</td>
</tr>
<tr>
<td>2011</td>
<td>8.40</td>
<td>0.60</td>
</tr>
</tbody>
</table>
Figure 1: Planting area change of bast fiber crops in China

Ramie and Linen obviously decreases as time.
Figure 2: Output of bast fiber crops in China

This figure shows the same change with Figure 1. Ramie and Linen *obviously decreases*, and other four kinds of bast fiber crops *slightly fluctuates*. 
1. 2 Trade situation

Table 2 The import and export number of China’s bast fiber in 2010

<table>
<thead>
<tr>
<th></th>
<th>Quantity (10,000 tons)</th>
<th>% to last year</th>
<th>Amount (million dollars)</th>
<th>% to last year</th>
<th>Price (dollar/kg)</th>
<th>% to last year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fiber raw material</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export</td>
<td>0.81</td>
<td>30.77</td>
<td>0.10</td>
<td>37.21</td>
<td>1.23</td>
<td>4.24</td>
</tr>
<tr>
<td>Import (+)</td>
<td><strong>67.54</strong></td>
<td>13.36</td>
<td><strong>4.67</strong></td>
<td>51.99</td>
<td>0.69</td>
<td>32.69</td>
</tr>
<tr>
<td><strong>Linen yarn product</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export (+)</td>
<td><strong>3.13</strong></td>
<td>48.61</td>
<td><strong>2.28</strong></td>
<td>96.56</td>
<td>7.28</td>
<td>32.36</td>
</tr>
<tr>
<td>Import</td>
<td>1.72</td>
<td>49.40</td>
<td>0.29</td>
<td>63.03</td>
<td>1.67</td>
<td>9.15</td>
</tr>
<tr>
<td><strong>Bast fabric production</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export (+)</td>
<td><strong>26.83</strong></td>
<td>22.50</td>
<td><strong>6.32</strong></td>
<td>34.52</td>
<td>2.36</td>
<td>9.77</td>
</tr>
<tr>
<td>Import</td>
<td>2.87</td>
<td>-4.31</td>
<td>0.63</td>
<td>-10.11</td>
<td>2.21</td>
<td>-5.96</td>
</tr>
</tbody>
</table>
More import of raw material. More export of yarn and final production.

This leads to **high cost** and **low profit** in China’s bast fiber industry. **This is a crucial factor to impact on** the planting area and output in China.
1.3 Producing situation

Firstly

The machines and tools used to produce final products are too obsolete to meet the requirement of modern market. And increasing cost of labor reduces the producing profit.

Secondly

The products are still traditional textile products, like cloths, fiber, yarn and etc. The ability to design and produce new products are relatively insufficient.

Thirdly

The pollution of removing pectine weakens bast industry competition with cotton and other nature fiber. And the pollution brings additional producing cost.
Fluctuation transitivity along traditional industry path

- Fluctuation in foreign markets
- High price of raw material and low demand quantity
- Market driving
- The risk from the market finally stresses onto the shoulders of the farmers.
The risk from market directly **impact on the stability** of the whole bast fiber industry chain.

Once **price and demand in markets happens to fluctuate**, it will pass back into the end sectors (farmer) and form **a greater fluctuation**.

To a large extent, the market risk causes the result of **low planting area and output**.

**How to improve?**
2. Possible solutions to China’s bast fiber industry

2.1 Building a new industry path

Feature 1: expand a single product to multi products

Feature 2: design, and produce products according to market

Feature 3: broaden domestic demand instead of just oversea market.
new usage 1: Mushroom culture medium

The experiments show that the mushroom have the follow features: rapid growth, almost identical shape, good taste, high nutritional value.

This utilizes the bonds of Ramie and increases profit about 700 RMB/Mu.
The ramie, jute, and kenaf have rich protein.

- The ramie protein content is up to 22%.

Animal feeding material

Farms can get about 900 kg fresh ramie leaves per acre once. We have had the feed and storage technology of ramie.

Utilizing the leaves of Ramie, jute, and kenaf to feed can increase profit about 1900 RMB/Mu.
The process of producing feeding material

Collecting → Drying → Binding → Feeding → Storage → Wrap
Ramie economic analysis under traditional usage model

Traditional textile fiber → Fiber output is about 300 kg/Mu → Fiber purchasing price from factory is about 12,000 RMB/ton

Cost of removing pectin is about 5,000 RMB/ton → Trade cost is about 600-1,000 RMB/ton

Farmer’s final profit is about 6,000-6,400 RMB/ton (1.5-1.6 RMB/kg), that is, about 1,800-1,920 RMB/Mu

little net profit

Mu=667m²

Farmers have little motivation to plant bast crops due to much low income.
Ramie economic analysis under multi-usage model

- **Leaf** (600 kg/Mu)
- **Bone** (900 kg/Mu)
- **Fiber** (300 kg/Mu)

**Protein feeding material** (20-24%)

**Feeding cow**

**Beef/Milk**

**Biogas**

Feeding experiments show that reduce cost of feeding about 1900 RMB/Mu.

Growth experiments show that increase profit about 700 RMB/Mu.

Traditional fiber profit is about 1800-1920 RMB/Mu.

Multi-usage increase profit by about 2600 RMB/Mu. Supply more power to drive the whole industry. Except feeding and culture medium, we are considering the other new applications like building, vehicle and biological energy, environment protection material.
3. The future development of bast fiber industry in China

3.1 Realize industrialization of multi usages

This is a key step to build a new industry path of bast fiber crops.
3.2 Research easy and cheap technology to remove pectine in bast fiber

This is important to reduces cost and increases profit, and is a necessary action to meet the requirement of environment protection.

we have several biological removing technologies, but due to its cost and complication, they aren’t widely used in processing. Currently, we intend to build a removing center to reduce the cost of factories, especially small size factories.
3.3 Continue improving the quality of bast fiber

Designing **high quality fiber** meets the market’s demand. Currently, main products are still in fiber fields. We need high quality products to pull the development of bast fiber industry.
3.4 Combine bast fiber into emerging industries

How to combine into emerging industries like building, energy, environment protection and water treatment industry is quite important for future development. In addition, how to mix with other nature fiber like cotton is also an important aspect.
Figure 4 A cooperation model among four agents

The aim to build a cooperation model is to solve farmer’s financing difficulty and increase their pricing ability. This action is helpful to maintain the plant area in Pinguo district experiment.
Thank you for your attention!