Think Globally, Cluster Locally - How Can a Chinese Toothbrush

Cluster Upgrade

Contribution to an international workshop on Clusters and Global Value Chains in the North and the Third World

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Introduction

Cluster is often defined as geographical concentration of similar or related independent firms (HE Jian 2002, 2003a, 2003b). In recent two or three years, it becomes one of hot issues in Chinese academy in that clusters of especially small firms have grown faster in the form of development areas, industrial zones, software parks etc. Actually cluster (or clustering) is not a new phenomenon at all in China. Many clusters of firms in traditional industry, spreading in counties and villages, grow naturally in a long history and thus inherently have specific characteristics. Nevertheless, under the pressure of globalization, many of these are facing great challenge to strategically upgrade in order to adapt themselves to rapid change of competitive environment. This paper is an attempt to explore a path to future success of a Chinese toothbrush cluster under this circumstance. We first give a general overview of this toothbrush cluster. Then, based on our questionnaire survey, we will explore conditions for success of this cluster, followed by investigation of potential problems in its development. In the end, some preliminary conclusions will be drawn to seek upgrading strategies for this toothbrush cluster under globalization and the spread of information technology.

Methodology of research

The theory of industrial cluster we use is based on Van Dijk (1997), which introduced an evolutionary perspective to look at cluster development. Van Dijk (2002) further suggests a classification of clusters according to the geographical level, ranging from a national to a suburban cluster. We have conducted this research in an empirical circle. To conduct such an empirical research, we have selected Hangji P. R. China, where this toothbrush cluster locates, as case study place. In the year 2002, to do detailed case studies I collected first-hand data from some 60 firms. Our research method concerned a fieldwork survey with a pre-coded questionnaire including a few
open questions. I went to this toothbrush cluster for two times, respectively in June and in November in 2002, in order to get immediate information from this cluster. The fieldwork was absolutely supported by Mr. KAN Xiaohong, one of my friends working as an official in this region. The questionnaire had been formulated before with the help of Prof. Dr. Meine Pieter van Dijk from Erasmus University Rotterdam.

Further, some visits were taken to collect secondary data from local public libraries and institutions. Besides these, we also visited some departments of local and regional governments, where the cluster was located. Government officials relevant to our research have been interviewed, some with questionnaire interviews. Data from different sources gave us a comprehensive overview of this cluster.

In this research, we also formulate one hypothesis: this toothbrush cluster may have few external links to international markets, giving priority to meeting demand from local and domestic markets. It’s recommended to upgrade itself by taking innovative initiatives. We expect to test this hypothesis after the data collection and analysis.

**Background**

Situated at a place where the Yangtze River and the ancient canal meets in the developed area of Yangtze River Delta, surrounding Yangzhou, a historical city of fame, Hanjiang is the main development field and hinterland of Yangzhou. Hangji county is 8 kilometers far from the center of Hanjiang. Hangji Town covers an area of 120 square kilometer and has a population of 35,600. The most famous about this county is, if you travel here and you will find, its “toothbrush” everywhere. In China, it’s often called “the cradle of toothbrush” and the biggest official newspaper People’s Daily ever reported this small place in special column. Toothbrush production in this town has experienced a long history dating back to 1827 (Hanjiang District Statistical Annuals 2000).

Currently, there are 990 toothbrush manufacturers in Hangji cluster. In 2001, about 4 billion toothbrushes have been produced with the total turnover up to 1.44 billion RMB, indicating an increase of 15.2% compared to the year 2000. The toothbrush sales volume of enterprises in Hangji cluster took about 70% of the total in domestic market in 2000. In association with the toothbrush manufacturers, there are 8 raw material suppliers in this enterprise cluster, manufacturing and supplying plastics grains and plastics thread required in toothbrush manufacturing. There are 3 suppliers of toothbrush equipment, mainly manufacturing and supplying brush hair installing machines. In addition, there are 305 supporting business and service providers, including the supply of packing materials, printing and molding services. The toothbrush enterprise cluster involved 8500 employees in 2001. According to the statistics conducted by Hanjiang District Government in 2001, the toothbrush production oriented enterprises in Hangji achieved a total sales revenues of 1.44 billion RMB, represent an increase of 277% comparing with that in 1997, with an
average annual increase of 29%. In 2001, the toothbrush manufacturing enterprises paid taxes totaled 40 million RMB, representing an increase of 200% as against 1997, with an average annual increase of 10.87% (Hanjiang District Statistical Annuals 2002). This indicates that these enterprises have become a driving force to the local economy.

For many years, Governments of both Hanjiang District and Hangji Town have constantly formulated favourable policies to stimulate the growth of this industry. In 1987, when many Chinese people were still not quite sure about market economy, governments of Hangjiang District and Hangji Town had began to take significant measures to promote private business and help solving problems faced in developing private enterprises. The district government also put forward preferential policies for those quickly develop enterprises, giving support, offering tax relief and helping in solving financial problems. These policies have played an effective role in accelerating the growth of lots of toothbrush enterprises in Hangji.

**Evidence from a toothbrush cluster in Hangji**

I visited this town with my assistant from local government. With his assistance, I collected some valuable data from 48 toothbrush enterprises based in local areas. I interviewed their entrepreneurs to try to get first-hand information of their firms, such as their basic background, supply and marketing strategy, innovation initiatives, R&D strategy, human resource management, entrepreneur network, business environment and their export etc. The following table may give us an impression of these 48 enterprises.
### Table 1: An impression of studied sample from Hangji toothbrush cluster

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
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<td>20</td>
<td>10</td>
<td>10</td>
<td>40</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Private</th>
<th>Collective</th>
<th>Joint v.</th>
<th>SOEs</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
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<td>No.</td>
<td>44</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products Toothbrush</th>
<th>integrated</th>
<th>thread</th>
<th>stem</th>
<th>Colour design</th>
<th>others</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>26 (54%)</td>
<td>8 (17%)</td>
<td>5 (10%)</td>
<td>4 (9%)</td>
<td>5 (10%)</td>
<td>48 (100%)</td>
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</table>

<table>
<thead>
<tr>
<th>Net asset</th>
<th>&gt; 100</th>
<th>50-100</th>
<th>10-50</th>
<th>&lt; 10</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>5</td>
<td>6</td>
<td>19</td>
<td>18</td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Turnover</th>
<th>&gt; 10000</th>
<th>1000-10000</th>
<th>500-1000</th>
<th>&lt; 500</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>22</td>
<td>48</td>
</tr>
</tbody>
</table>

From this table, we could find some basic information about these 48 firms we have selected as studied sample. 92 percent of these firms are private. Although quite a few of them were established before the year 1997, 58 percent (33 plus 25 percent) were newly established, that is, they are only 6 years old. The main products they deal with are shown in the table. Some produce toothbrush thread, some toothbrush stem, some colour design, but we also find most of them (54%) have already concentrated on the integrated products, that is, the integrated toothbrush for a long time. With regard to their scale of economy, very few could be described as large enterprises. Together with information from our face-to-face interview, we find out that in this local area, there are three-level enterprises in terms of their scale of economy. The first level could be relatively biggest with its turnover more than 100 million RMB. They are the Sanxiao Group and its affiliation Colgate-Sanxiao Co., Ltd., a joint venture established in July 2000. Three firms with sales revenue ranging between 10 to 100 million RMB are seen at the second level: Yangzhou Mingxing Toothbrush Co., Ltd., Yangzhou Wu-ai Toothbrush Co., Ltd. and Yangzhou Jinsong Plastics Products Co., Ltd.. The left belongs to the third level, which have only below 10 million RMB.
turnover. Evidently, most are small and medium-sized enterprises (SMEs) in local area. Besides this, from our questionnaire interview, some typical characteristics are indicated as follows.

The significant growth of private sector

In China, private sector has developed very much and grown fast in recent years (HE Jian 2000, 2001). Local government policies have played a very important role in accelerating the growth of these SMEs. The year 1987 seems important to them in that, local government put 510,000 RMB to support the establishment of Hangji Industrial Trading Company, staff of which are actually from the Industrial Office of Hangji government. It was a signal that local government wanted to promote tentatively the toothbrush industry as a whole. A series of standard, such as product models, quality, certified criteria has been established. More important, before that year, only lots of salesman could be seen to sell their products and only a few formally registered corporate could be found in this town. Actually, this trading company was invested by local government to support thousands of local vendors, which have been family-based business for a long time. In the meantime, the local leaders in government emphasized the importance of private toothbrush enterprises and had brought quite a few favourable policies to nurture these SOEs. For example, vendors often had no legally registered license to do business, after the meeting with this special issue organized by government, a fearless but more than innovative policy were purposed: temporary business licence. It is not legally acknowledged but valid to be used by family-based toothbrush enterprises, and also supported by local authorities (taxation, business administration etc. Lots of family business could be operated given this temporary business license. With these efforts, by 1993, over 3,000 family-based small firms had appeared and now on average, this trading company yearly support 1,800 small firms and more than 100 becomes bigger each year which have ability to operate separately. Over 2,000 salesmen are active in local area. Stimulated by this policy, after the year 1987, the private sector has developed much.

A toothbrush cluster in traditional industry

A toothbrush value chain could be seen clearly in this toothbrush industry. Evidently, local products of these companies varies differently, including toothbrush stems, threads, colour design, mold, plastic paper, productive materials (PVC, VC etc.) and integrated toothbrush. They are evidently compatible in the same industrial value chain in Hangji. At each stage of productive activities, we can find lots of SOEs, including family business, agglomerated (often in one specific small zone). They cooperate each other and separately specify in even one smallest procedure. Someone even said, you could immediately find any complementary parts of a toothbrush that you want in any shop within walking distance in this county. It’s a traditional toothbrush cluster, which is mainly composed of toothbrush manufacturers. It
includes toothbrush manufacturers, raw material suppliers, production equipment suppliers, distributors, service providers and other business organizations. They usually exert their functions from the 7th to the 8th step of the working procedure for toothbrush manufacturing. The total number of the enterprises is 1306, of which, there are 990 manufacturers focusing on producing handles with polypropylene or polystyrene and brush hair installing (Hanjiang District Statistical Annuals 2001). As we indicate previously, Sanxiao Group and its affiliated joint venture Colgate-Sanxiao Co. Ltd are two biggest ones in this industrial chain. There is a big gap in terms of each business indicator between these two and the other three at the second level.

*The ownership of SOEs in this cluster*

As for the aspect of business management, lots of firms in the toothbrush cluster are operated in a family style. Based on the information we discovered through interviews, except for Colgate-Sanxiao Co., Ltd., which adopts modern business system, the toothbrush production enterprises usually adopt family-based management style. Some firms are managed jointly by brothers, some by wife and husband, and others by father and children. The family business, large in number, is mostly dominated by the proprietors with the participation of their family members. There is a single ownership structure in quite a few firms in Hangji cluster.

*Condition of market development*

98 percent firms choose to develop their internet to probe domestic and international markets. It’s not so surprising that small firms often deal with business through internet. For these SOEs, they can find a lot of valuable information of market from the internet. Moreover, domestic market, middle and small-sized cities and rural areas are the major markets for these firms. Looking at relations between domestic market and international market, you can find firms are often targeted at domestic market. In 2001, the enterprise cluster realized a total sales revenue of 1.44 billion RMB, of which, 1.252 billion RMB comes from domestic market and only 0.188 billion RMB from international market, domestic sales taking 86.9% of the total. In sales in domestic market, most of the products find sales in small or medium-sized cities and rural areas with the market share in big cities not remarkably high. In international market, the toothbrush products are sold mainly to Africa, Southeast Asia, Middle East, and sales to European and American markets are not high.

*R&D activities*

How can these small firms develop their products? They usually adopt self-development model. From our investigation in 48 toothbrush enterprises, 92 percent of them choose to adopt this way which focuses on the visible aspects of the products, for example product appearance and style etc. Actually, they often learn
from big firms. For example, most learn from Colgate-Sanxiao. Imitation and copy of one product has been adopted by more.

*Human resource development*

From our investigation, 94 percent of all employees in these 48 firms have college-level degree. Very few have university-level education, no matter graduate-level. We also find, in this cluster, most of the jobholders in the enterprises are local residents. In 2001, the toothbrush enterprise cluster involved a total of 8,500 jobholders, of which 6,160 were local residents and 2,340 were people from outside. Local residents are the main part of the jobholders in the enterprise cluster, but jobholders from outside the local area have also taken considerable proportion. This could be the evidence of its growing attraction to talents from outside.

*Findings and hypothesis testing*

Besides the valuable face-to-to interviews by questionnaires, we also went to local libraries and statistical bureau, and refer to considerable documentation. Base on these information, we like to present some conditions of its success and in the meanwhile, some potential problems could also be perceived.

This cluster plays a very important role in national toothbrush market. In 1987, the production of toothbrushes from the enterprise cluster takes one third of the total all over the country (Record of Hangji Town p. 101, 1992). Sanxiao toothbrush held a market share of 56% in the year 2000. In 2001, total industrial output of local toothbrush production accounts till 70 percent of all in China. Three angles can be looked at to justify this cluster’s success.

1. Long-time cultural atmosphere of toothbrush production

This has been described by Mr. Kan Xiaohong in detail. As he articulated, there has been a traditional toothbrush industry in Hangji for a long time dating back to 1827. people become to be involved in the production and or distribution of toothbrushes or tourist products including toothbrushes, or engaged in the supply of raw materials and supporting services. As a result, a lot of people is familiar with this business. For example, under present conditions of processing techniques, they can accurately calculate the breakdown of capital costs with the accuracy to 1/10 fen (Kan Xiaohong 2001). In many families, Children grow up under this business atmosphere, and join the toothbrush industry naturally when they grow up. So it’s much easier to set up a toothbrush enterprise since you can find easily experienced workers.

2. A national wide powerful sales network
Every time we interview employees and entrepreneurs, they always tell us the past story about how their ancestors create this business in a hard environment. They are proud of the spirit of their hard-working in the history and their capability of developing market, which was frequently described. They considered it had inspired the follower. Consequently, the powerful sales network at national level has been established. Nowadays there are over 2000 toothbrush salesmen from Hangji cluster, who buy in toothbrushes in low prices, and sell out in other parts of the country in higher prices. Most enterprises are private and their product’s price can be negotiated more flexibly than SOEs and foreign-invested enterprises. This has brought lots of small firms competitive advantages.

3. A local specialised network of transaction

In Hangji, a specialized labor division among firms have been emerging. A lot of various firms in such an industrial value chain cooperate closely with productive enterprises (core enterprises), such as suppliers of raw materials and equipment and providers of auxiliary services such as printing, packing and etc. Quite a few specialized manufacturers, like Colgate-Sanxiao, have become the core of the value chain. As previously described firms often find easier to find business partners that produce complementary products they want. Local authorities, business associations and other intermediary organizations often assist in financial, tax and information share, making their services available for firms. All of these have facilitated rapid information flow within this cluster and thus brought about a localized network based on specialisation in Hangji. As a result, some experts and researcher describe the Hangji cluster as follows: competitive low price, prompt delivery, powerful sales network, rapid information flows and hard-working spirit of salesman (also in Kan Xiaohong 2001).

We are going to test the only hypothesis. We ever hypothesized that, this toothbrush cluster may have few external links to international markets, giving priority to meeting demand from local and domestic markets. This could be elaborated firstly from the analysis of some potential problems existing in Hangji cluster. On the basis of previous analysis, some problems are identified from our questionnaire investigation as follows

1. Many SOEs have a poor ownership structure

The main reason comes from its problematic ownership structure. As we indicate, most are private and develop themselves based on an old family-business style, under which family members control main positions of this enterprise, such as accounting division, human resource division etc. Employees out of family often feel boring and then flow to other firms. Frequency of labour flows (often technicians as backbone of firm) is high and job-hopping becomes a prominent phenomenon. Besides this, it makes it difficult to introduce experts and well-educated employees. This deserves to
attach much importance for most SOEs’ entrepreneurs. They become to lack the ability of management required by the intensifying competition in markets. This management style seems reasonable when the business starts but limits the further development of most of SOEs in this cluster.

2. There is the lack of innovative milieu in Hangji cluster.

One of the most frequently described problems (88 percent in our sample) is price competition. Entrepreneurs from SOEs worry about this kind of price competition but they complain that they have to be involved in competing by low price. Bigger companies like Colgate-Sanxiao have their specialised employee to conduct R&D and can announce some new products at times. However, they still worry about its patent products. Not like high-tech industry, any part of toothbrush can be easily copied by other even smallest enterprises. Consequences are serious. On one hand, imitation and copy of other companies’ products is accepted by some firms. On the other hand, most firms seldom innovate to promote new products. That’s why low-price competition occurs frequently. Besides these, lack of well-educated managers is another limit to innovation in Hangji cluster. In addition, except the joint venture Colgate-Sanxiao, many firms (92% of our sample enterprise) hardly have relationship with universities and research institutes. This could be potential limit to development.

3. There is the lack of an effectively operated entrepreneur network

We found in Hangji cluster there is a business association of toothbrush industry, which was newly established in April 2001. Several bigger enterprises and quite a few SOEs participate in it to exchange information. However, this association organizes very few activities in one year but most firms have to pay for their membership. Many complaints appear during our interview and there is a great need for an effectively operated entrepreneur network. Many firms including SOEs expect it could be a beneficial linkage to each other by exchanging information, searching business partners, avoiding possible confliction etc.

4. There still needs more support from government

In our investigation, when we asked the question “which of the following do you want to benefit from?”, we found the frequently ticked options are (in sequence based on our statistics): exchange of information (96%), complementary production (94%), local government policies (90%), diffusion of innovative technology (87%) and cooperation and trust among each other(85%). Among them, the option “local government policies” was rated higher. Many firms, particularly SOEs wants more realistic support, NOT “more promise, less realization” from local government. They expect to get more bank loans, more reduction rate of tax and no limit to export etc. Local government should put their promised support into the ground and promote the growth of SOEs with more realistic and favourable policies. They should also strengthen further their organizing capability.
More important, as some complained, small firms often found, compared to other bigger enterprises they often found themselves in an unfair situation. Almost each interviewed entrepreneur talked about the Sanxiao Group and thought that it had been given by local government too much priority to facilitate market competition. In consequence, the Sanxiao group and its joint venture Colgate-Sanxiao is easy to use low price to compete. The production of toothbrush in Hangji cluster totals 70 percent of all domestic market demand in 2000, 60 percent by the Sanxiao Group and 10 percent by others. From the mid of 1990s, many small firms had to change their main products to one-time-use toothbrush for tourists. Local officials should not have bias in mind. As I understand, more small firms deserves to nurture.

In summary, Hangji toothbrush cluster can be characterized as fast growing but lacking ability of upgrading itself. They still dominate 70 percent national demand for toothbrush in that over 2,000 salesmen are active at different areas of China and they covers a powerful sales network. Some big firms, like Colgate-Sanxiao, have started to sell their products to international markets, and some small ones deal with business through internet. Most of them, however, target only the domestic market and compete with each other in market by price. A number of employees are not well educated and many firms lack capability to innovate new products. Advanced management thoughts and activities have not appeared yet among this cluster although the first (also the only) joint venture Colgate-Sanxiao was established in 2000. The problematic ownership structure has become bottleneck for many firms in their development. All of these result in their giving priority to meeting demand from local and domestic markets. It is obvious that this toothbrush cluster have few external links to international markets. It is a realistic approach and becomes more important than before. What policies local authorities should formulate to support these firms is the first to do.

**Conclusions and recommendations**

This research answers the question how a traditional cluster can upgrade itself under the pressure of globalisation. Many are still ahead to upgrade this traditional toothbrush cluster. Both government and firms have to take innovative actions. For some important strategies for them to adopt first seem to be:

1. Creating an innovative environment in local areas.

Government can set up fund of innovation; organize fairs and even salon between universities and clustered firms and introduce etc. In the meanwhile, government should improve local legislation of patent to protect products with patent. A good market environment could appear only if Imitation and copy of products are gradually
excluded by improved laws targeting patent protection.

2. Providing more services for firms in the cluster.

Local government should put emphasis on its function of supplying with services. A special office like a service center can be established to strengthen linkage between government and firms in the cluster. Equal to big enterprises Banks should be encouraged to supply SOEs with more loans with low interest. Besides this, government should establish enterprise zones nearby to meet the demand of growth of firms. It contributes by effectively attracting more firms even some foreign direct investment to this cluster.

3. Leading local business association to play important role.

Government should fully support this newly established association in finance and its organization. Innovative ideas often appear when entrepreneurs keep mutual frequent contact in this association. To establish an entrepreneur network, the association should also position itself in “serving for all” and bring into play its role as linkage to each firm in Hangji cluster.

For firms in Hangji cluster, we suggest the following strategies to adopt first:

4. Putting more emphasis on R&D.

They should give up imitating and copying from others and produce their own products protected by patent. To strengthen ability of R&D becomes important. This can be achieved by employing more experienced workers and introducing well educated staff. To be innovative enough, firms in Hangji cluster have to seek to link themselves to universities and research institutes.

5. Improving ownership structure.

Many firms should take realistic measures to improve their ownership structure. They should realize that family-based business could not go long. They should change their belief first and then encourage more talents to be a member of management team. Training also becomes crucial to improve education level of current employees. Kan recommend to firms to change to stock company to improve its corporate governance.


In the course of upgrading of cluster, firms should both think globally and cluster locally. Large firms could be exemplar of this advancement. Like Colgate-Sanxiao, big enterprises and a few small firms have started to frequently contact with foreign customers. This may be the most important step to upgrade this toothbrush cluster in
that, firms become more innovative if they keep traces with international markets.

In conclusion, these suggestions could only be brought into effect only if both government and firms realize the time to change and take innovations to improve themselves.

References


