

# **Final Report on Trade and Sustainable Development in China**

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## **Chapter One Background**

### **1.1 The Relationship between Trade and Sustainable Development**

After World War II, some countries took the initiative to found GATT in order to promote trade liberation, reasonable deployment of resources and economic development. GATT has played an active role in promoting trade liberation and world economy. However, as a result of an accelerated transformation from economic regional integration to globalization, the between trade and environment closely related to the world economy has become closer and closer as the environmental problems are aggravated with the economic growth.

The relations between trade expansion and environmental protection are complicated in that they can be mutually enhanced as well as constrained. Global trade liberalization will on the one hand enhance the development of the world economy, while on the other hand stimulate the over-exploitation of resources and ecosystems. This in turn will lead to severe environmental and ecosystem damages.

The environmental laws and standard permits in some developed countries do not allow for some products to be manufactured or sold domestically. So those countries take advantage of the relatively less stringent environmental regulations and standards in developing countries, either to manufacture products of this kind in developing countries or to export to developing countries large quantities of products, which are prohibited from using in their own countries. Overemphasis on environmental protection will pose limits on trade liberalization, or even become a new trade barrier.

At present, some countries have adopted unilateral trade measures based on environmental protection. Due to differences in development levels and environmental situations, disparities exist between industrialized and developing countries in their environmental legislation and standards. In general, the environmental standards of most of developing countries are lower than those of industrialized countries. Therefore, some environmental trade measures adopted unilaterally in industrialized countries according to their domestic standards usually become new technical barriers for developing countries' access to their markets. This results in new unequal economic relations between nations, which severely impacts the economic development and foreign trade of developing countries. In addition, many such unilateral measures lack a scientific basis and are rather

arbitrary in their formation and implementation. They are often used as excuses for green protectionism. They exercise a negative impact on international economic cooperation and the economic development of developing countries, and do not do much good to global environmental protection. Therefore, these environmental trade measures should not be advocated. The issues of trade and the environment should be instead resolved through multilateral and bilateral negotiations and consultation.

In the unreasonable international economic order formed in history, the exports of developing countries have mainly been raw materials and primary products, because these countries lack advanced technologies and the capability of producing high-tech products. This, in addition to inefficient management, results in the low export price of these products. In the past, the developed countries had used a tremendous amount of cheap resources from underdeveloped countries, resulting in serious environmental pollution and ecological damage in these countries. This makes it difficult for developing countries to check the worsening trend of environmental pollution, resource damages, and ecological degradation.

Since reform and opening policy was adopted, China's economy has been growing rapidly. His GDP increased from 1,407 billion yuan RMB in 1988 to 7,477.2 billion in 1997. If calculated according to a comparable price, the annual economic growth rate is 10% or so. China's foreign trade has been also expanding quickly with the annual growth rate of import and export volume amount to 16.2%. The total trade volume in 1997 was 325.06 billion USD, with a rise of 12.1% than 1996. The export volume in 1997 is 182.7 billion USD and the import volume of that year is 142.36 billion USD, respectively with a increase of 20.9% and 2.5% than 1996. In terms of total trade volume in 1997, China has become the 10<sup>th</sup> trading nation in the world, a rise from the 32<sup>nd</sup> in 1978.

However, the economic growth was achieved mainly through investment of capital and labor and the traditional development strategy focused more on the rate and quantity than the quality and efficiency of development because of a relatively weak industrial foundation and inadequate technological level and poor equipment due to neglect of technical creation under the planned economic system. The industrial characteristics, as a result of long-time process, is that there is a bigger percentage of resource-intensive and energy-intensive industries and the level of production technologies is low, which has brought pressure on sustainable exploitation and utilization of resources.

Accordingly, the exports from China are dominated by raw materials and primary products in terms of the structure of exported products. Even the processed exports are those labor-intensive, low-technical-value-added and under-processed industrial products. This situation has been changing gradually since reform and opening policy was adopted. The percentage of primary products in exports fell from 46.1% in 1981 to 13.1% in 1997. The economic growth has resulted in a change in export structure as well as an increase in processed and technology-intensive exports.

The government of China attaches importance to environmental protection while developing his economy vigorously. In the past 20 years and over, China has been endeavoring to practice industrial pollution prevention and control and integrated improvement of the urban environment, strengthen ecological conservation, establish an environmental legal system suitable for the Chinese reality, develop the environmental industry and expand the international cooperation in the field of environmental protection. It is due to strengthening of environmental protection and the industrial readjustment that the environmental quality is maintained at a stable level without degrading accordingly with the growth of the economy.

The Meeting of the Eighth National People's Congress held in March, 1996 adopted the National Ninth Five-year Plan for Economic and Social Development and the Long-term Program for 2010. This document had clearly proposed that two fundamental transformations be realized in the economic system and the mode of economic growth and the national strategies of sustainable development and revitalizing the nation with science and education be implemented. It has also set the environmental goals for 2000 and the years up to 2010, i.e. by 2000, the trend of environmental pollution and ecological worsening will have been controlled to a proper extent and the environmental quality basically improved in some cities and regions. The Fourth National Conference on Environmental Protection held in July, 1996, after having summarized the environmental protection work in the past five years, made arrangement for future work, proposed a series of important policies and measures and gave priorities for 1996 to 2000 to water pollution control in three rivers and lakes an air pollution control in acid rain and SO<sub>2</sub> control zones. After the conference, the State Council promulgated the "Decision on Several Environmental Issues" and the "National Ninth Five-year Plan for Environmental Protection and the Long-term Program for 2010". As the two major measures for achieving the above goal, the State Council also approved the "Plan for Total-amount Control of Major Pollutants for 1996-2000" and "China Trans-century Green Projects

Plan”.

China attaches great importance to and takes an active attitude in the global environmental affairs. He has ratified, acceded to or accepted many international environmental conventions or agreements, including the Vienna Convention for Protection of Ozone Layer, the Basel Convention on Control of Trans-boundary Movement of Hazardous Wastes and Their Disposal, the Convention on Climate Change. He has been very serious in fulfilling his obligations under these conventions and agreements.

## 1.2 Foreign experiences in trade and environment

Foreign countries, such as Bangladesh, India, Pakistan, Republic of Korea and Vietnam, concerns about the trade-environment issues are different as their economic and environmental endowments are so heterogeneous. However, those differences seem to reflect their different stages in economic development and different degree of exposure to the international market. Vietnam’s concern is focused on the issue of environmental management in the primary sectors, such as agriculture and fishery, which recorded export-led growth recently (see Table1-1).

**Table 1-1 Impact of Export-led Growth on the Environment in Vietnam**

<b>Industry</b>	<b>Description of Cases</b>
Agriculture	<p>a. The negative environmental impact of agriculture is attributed to land reclamation, production and use of agro-chemicals, and the wastes from food-processing facilities.</p> <p>b. As the production and export of agricultural products increased, the import of fertilizers increased from 1,085 tons in 1990 to 4,134 tons in 1994. The import of pesticides increased US\$9 million in 1990 to US\$ 58.9million in 1994. 20,000-25,000 tons of pesticides are used in Vietnam annually.</p> <p>c. Lowering the portion of raw material in exports, through policies such as the promotion of food processing industry, is believed to contribute to reducing the environmental pressure from the exploitation of natural resources. It is believed that the increased revenue from the food processing industry can benefit the environment via the improved technical efficiency in treatment.</p>
Fishery	<p>a. The recent booming development in the fishery and aquaculture sectors has caused environmental problems. The environmental problems seem to be related to the increase of export-led production of aquatic products. It is certain that export-oriented growth, if continued without appropriate environmental measures taken, will damage the</p>

	<p>environment.</p> <p>b. The most obvious environmental damage caused by the expansion of the fishery sector is the destruction of the mangrove remains while it used to be 300,000 hectares in 1942.</p>
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Bangladesh is relatively optimistic about the environmental consequence of export-led growth by small and medium sized enterprises in the light industries. India and Korea are concerned the effect of realized or potential trade/environmental measures by advanced countries on their products' competitiveness.

There are other case studies on different research contents, such as on issues relating to trade/environment measures (including national environmental requirements, environmental labelling, and ISO 14000) and impacts of and responses to the MEAs with trade provisions.

National environmental requirements, when applied to foreign products, have considerable trade effects. Some case studies have been done in Bangladesh, such as on garments and frozen food. Those studies mainly focus on impacts of other countries' (including U.S., Canada, EU, Germany and Japan) environmental requirements. The details of two cases are described in Table 1-2.

**Table 1-2 Case Studies on National Environmental Requirement in Bangladesh**

<b>Country of Exports/Industry</b>	<b>Country Imposing Environmental Measures</b>	<b>Description of the Cases</b>
Bangladesh/Garments	Germany	Bangladesh's garment export is not affected by the German Azo dye ban because Bangladesh manufacturers do not use Azo dyes.
Bangladesh/Garments	U.S., Canada & EU	<p>a. The garment sector is subject to quota restrictions from the U.S. and Canada. The EU countries provide GSP for 16 items with 13-14% duty preference.</p> <p>b. So far, the garments industry has no restrictions from the trading partners on the basis of product standard. Bangladesh is possibly subject to the *Child Labor Deterrence Act* of the U.S. (1992), which bans imports of products made by child labor.</p>

Environmental labelling is of primary concern for exporters since it forces them to use specific technologies and incurs additional costs. As shown in Table 1-3, many case studies on eco-labelling schemes have been conducted in Bangladesh and Korea.

**Table 1-3 Case Studies on Environmental Labelling in Korea and Bangladesh**

<b>Country of Export</b>	<b>Country Providing Labelling Scheme</b>	<b>Description of Cases</b>
Bangladesh	EU	<p>a. EU Ecolabelling System is expected to include textiles, footwear, and timber. Garments and leather, major export sector of Bangladesh, would be covered by the EU ecolabelling scheme. Bangladesh exporters are completely not prepared for this situation.</p> <p>b. UNIDO has proposed to provide technical assistance to the Bangladesh leather industry, so as to create awareness about ecolabelling.</p>
Korea	OECD countries	Following the survey done by the Korean Chamber of Commerce in 1995, only 1.3% of the Korean firms have been granted eco-labelling of the importing countries. Around 1.6% applied for ecolabels, 20.1% are planned to obtain ecolabels in the future. 52.6% do not produce products subject to ecolabels. 24.4% of the firms have no idea about the ecolabels at all.
Korea	EU	For textiles and footwear, Korean exporters are concerned.

Now, the work of ISO 14000 is moving fast without close consultation of WTO. The Asia-Pacific countries have deep concerns with the potentially severe trade effect of ISO 14000 series. International standards of environmental management in fact induce the convergence of environmental standards among countries via changing behavior. Some case studies have been done in Korea and Vietnam. Results of case studies in Vietnam are the following: ISO 14000 will provide opportunities and trade barriers. New investments will improve cost efficiency and environmental competitiveness in the long run. However, the costs incurred by the certification will be a big burden. Many Vietnamese medium-scale exporters fear the risk of losing their market in developed countries due to the ISO 14000 series.

Moreover, many case studies have been focused impacts of and responses to MEAs with Trade Provisions, such as cases on Montreal Protocol (MP), Convention on International Trade in Endangered Species (CITES) and Basel Convention (BC) (see Table 1-4).



**Table 1-4 Case Studies on Conventions**

<b>Country/ Convention</b>	<b>Description of Cases</b>
India/MP	<p><b>Impacts:</b> cost of compliance: to be estimated</p> <p><b>Response:</b> Two World Bank supported projects are being undertaken. ODS Project 1: Conversion of compressors and refrigerators to ones using substitutes (US\$1.25 million)</p> <p>ODS Project 2: Help cost-effective ODS reduction of industries.</p>
Vietnam/ CITES	<p>a. Trade in endangered species is controlled at major ports, international airports, major markets, and border crossings.</p> <p>b. The trade of endangered species in Vietnam is increasing despite the efforts and plans of the Vietnamese government. Only about 10-15% of caught animals have been confiscated and left back to the nature.</p>

Although all above cases studies involve many aspects of trade and environment. However, the environment as well as trade is only a part of sustainable development. Few cases is from the view of sustainable development. Moreover, the sustainable development has been implemented as a national strategy.

At the fourth EPTSD meeting was held in April 1997 in Hanoi, Vietnam. Its main task is to develop a process methodology of building policy packages, which will harness trade to sustainable development. Its outputs produced by the panel is as the following:

- a. A methodology for building policy packages which distinguishes between Principles, Guidelines and Tools. These three elements are ‘integrated’ in the sense that they are internally consistent, mutually reinforcing and cover the main issues.
- b. A schema of three different, but interrelated products which it will promote among its target audience, i.e., government policy makers and the wider policy community: Generic Framework, Sectoral Toolboxes, and Model Application of Policy Packages.
- c. A Generic Framework, consisting of Principles and Guidelines which are applicable in any trade sector.
- d. Sectoral Toolboxes, consisting of Principles, Guidelines and Tools which are applicable to the trade sectors of timber, textiles and electricity.
- e. A model application of an Integrated Policy Package for forestry which can be adapted to specific country circumstances and developed with full stakeholder participation.

## **Chapter Two**

### **Trade, Environment and Sustainable Development in China**

#### **2.1 Trade Development in China**

Since opening-up policy of China, its economy has developed very rapidly and GDP of 1997 has been up to 7477.2 billion RMB, increasing by the growth rate of 8.8%, which has fulfilled the original target of quadrupling the GNP of 1980 by the year 2000 ahead of schedule. The industrial output value has increased 17.8%, the modification of products structure has been accelerated and the output value of coals, electric power, iron and steel, automobiles, chemical fibers, fertilizers and electrical household appliances have increased greatly.

##### **1. Status Quo of Trade Development of Major Industrial Sectors in China**

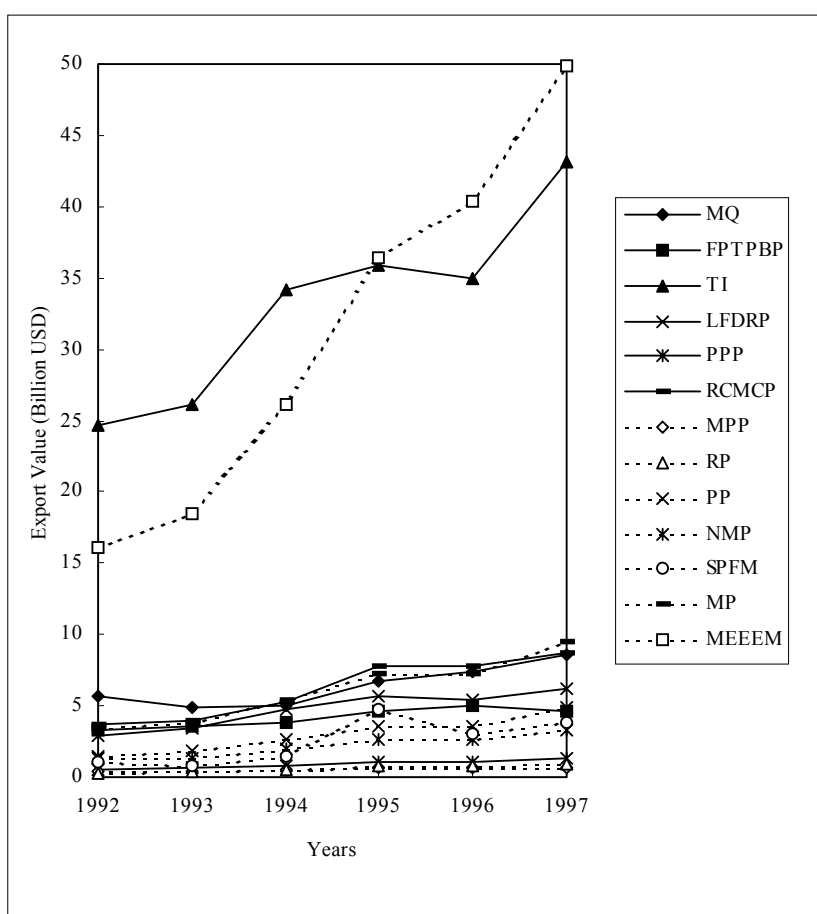
With the development of domestic economy and the improvement of production capacity, China's imports and exports have achieved significantly. Particularly after the opening-up of China, the foreign economic trade has got on a step. The world average of export value has moved towards US\$5020 billion in 1995 from US\$3470 billion in 1990, with the total growth rate of 44.7% and 7.7% growth rate per year. In the same period, the proportion of China's total exports in the world total exports increased from 1.8% to 3.0% and the rank in the world has leaped to 11 from 15. In 1997, China has ranked at 10. In more than twenty years of opening-up, China's growth rate of foreign trade has been much higher than that of GNP, which has already been very high, and thus has become the sustained increase point of national economy. In 1990s, the percentage of China's total value of exports and imports in GNP is always higher than 30% (see Table 2-1). Due to the influences of Southeast Asian finance crises and other factors, the growth of foreign trade in 1998 is negative. Till half past year in 1999, due to the economic resurgence in the whole Asia, China's foreign trade have also grow distinctly.

**Table 2-1 Total Export and Import (TEI) and GNP in China**

Year	GNP(billion USD)	TEI (billion USD)	TEI/GNP(%)
1990	388.78	115.44	26.69
1991	406.98	135.63	33.33
1992	483.27	165.53	34.25
1993	599.81	195.70	32.63
1994	541.50	236.62	43.70
1995	688.50	280.86	40.79
1996	812.58	289.90	35.68
1997	886.06	325.06	36.69

Source: China Statistic Yearbook, 1998, China Statistic Yearbook Press.

**1) China's Export in China's Key Industrial Sectors**



**Figure 2-1 Export Value of Major Industrial Sectors in China**

Source: China Statistics Yearbook, 1993-1998, China Statistics Yearbook Press.

China's export trade in 1950s and 1960s is mainly agricultural products, sideline products and their processed products, which altogether are more than 70% of total exports. In spite of slightly decline during the natural disaster period in early 1960s, the percentage was still above 65%. From the beginning of 1980s, it was the first time that the proportion of industrial products and mineral products export in total export is 51.8%, exceeding 50%. Since then, the proportion has gradually ascended, with 77.5% in 1991 and 85.5% in 1996. China's export is based on the domestic economic construction. With the development of national economy and the improvement of industrial structure, the categories and varieties of export goods have been continuously widened, the levels of export products have been from low to high and their added value and technological ingredients have also been raised significantly.

**Table 2-2 Ranks of Major Industrial Sectors in China according to their Exports (Billion USD)**

Sectors	Exports in 1995 (ranking)	Exports in 1997 (ranking)	Total Exports from 1992 to 1997(ranking)
<i>Machinery, Electronic and Electric Equipment Manufacturing (MEEEM)</i>	<b>36.47(1)</b>	<b>49.86(1)</b>	187.48(2)
<i>Textile Industry (TI)</i>	<b>35.88(2)</b>	<b>43.20(2)</b>	198.94(1)
<i>Raw Chemical Materials and Chemical Products (RCMCP)</i>	<b>7.80(3)</b>	8.75(4)	37.31(4)
<i>Metal Products (MP)</i>	<b>7.29(4)</b>	9.55(3)	36.87(5)
<i>Mining and Quarrying (MQ)</i>	<b>6.72(5)</b>	8.60(5)	38.20(3)
<i>Leather, Furs, Down and Related Products (LFDRP)</i>	<b>5.64(6)</b>	6.26(6)	28.45(6)
<i>Smelting and Pressing of Ferrous Metals (SPFM)</i>	<b>4.79(7)</b>	3.85(9)	15.07(9)
<i>Food Production, Tobacco Processing &amp; Beverage Production (FPTBP)</i>	<b>4.63(8)</b>	4.65(8)	25.10(7)
<i>Plastic Products (PP)</i>	<b>3.55(9)</b>	4.84(7)	17.97(8)
<i>Nonmetal Mineral Products (NMP)</i>	<b>2.67(10)</b>	3.24(10)	13.16(10)
<i>Papermaking and Paper Products (PPP)</i>	<b>1.11(11)</b>	1.32(11)	5.36(11)
<i>Rubber Products (RP)</i>	<b>0.75(12)</b>	0.95(12)	3.68(12)
<i>Medical and Pharmaceutical Products (MPP)</i>	<b>0.62(13)</b>	0.64(13)	3.22(13)

Source: China Statistics Yearbook, 1993~1998, China Statistics Yearbook Press.

## 2) China's Import Trade in China's Key Industrial Sectors

**Table 2-3 Ranks of Major Industrial Sectors in China according to their Imports (Billion USD)**

Sectors	Import Value in 1995(rank)	Import Value in 1997(rank)	Total Import Value from 1992 to 1997 (rank)
<b>MEEEM</b>	<b>56.87(1)</b>	56.97(1)	309.41(1)
<b>TI</b>	<b>15.82(2)</b>	17.22(2)	82.36(2)
<b>RCMCP</b>	<b>10.15(3)</b>	10.06(5)	49.31(3)
<b>PP</b>	<b>8.02(4)</b>	10.20(4)	42.91(5)
<b>MQ</b>	<b>7.23(5)</b>	13.01(3)	46.94(4)
<b>MP</b>	<b>6.29(6)</b>	6.45(6)	32.33(7)
<b>SPFM</b>	<b>5.88(7)</b>	6.07(7)	42.69(6)
<b>PPP</b>	<b>3.34(8)</b>	4.98(8)	19.45(8)
<b>LFDRP</b>	<b>2.49(9)</b>	2.68(9)	13.22(9)
<b>FPTBPB</b>	<b>1.93(10)</b>	2.56(10)	9.87(10)
<b>RP</b>	<b>0.98(11)</b>	1.26(11)	5.60(11)
<b>NMP</b>	<b>0.95(12)</b>	1.05(12)	4.75(12)
<b>MPP</b>	<b>0.26(13)</b>	0.24(13)	1.56(13)

Source: China Statistics Yearbook, 1993-1998, China Statistics Yearbook Press.

China's export trade in recent years has kept at high growth rate (see Fig. 2-1). According to the statistics in 1995, China's top five industrial sectors with largest value of export trade are as the following: Machinery, Electronic and Electric Equipment Manufacturing(MEEEM), Textile Industry(TI), Raw Chemical Materials and Chemical Products(RCMCP), Metal Products(MP), and Mining and Quarrying(MQ) (see Table 2-2). Seen from the total exports from 1992 to 1997, the top five industrial sectors with largest export value are: TI, MEEEM, MQ, RCMCP and MP.

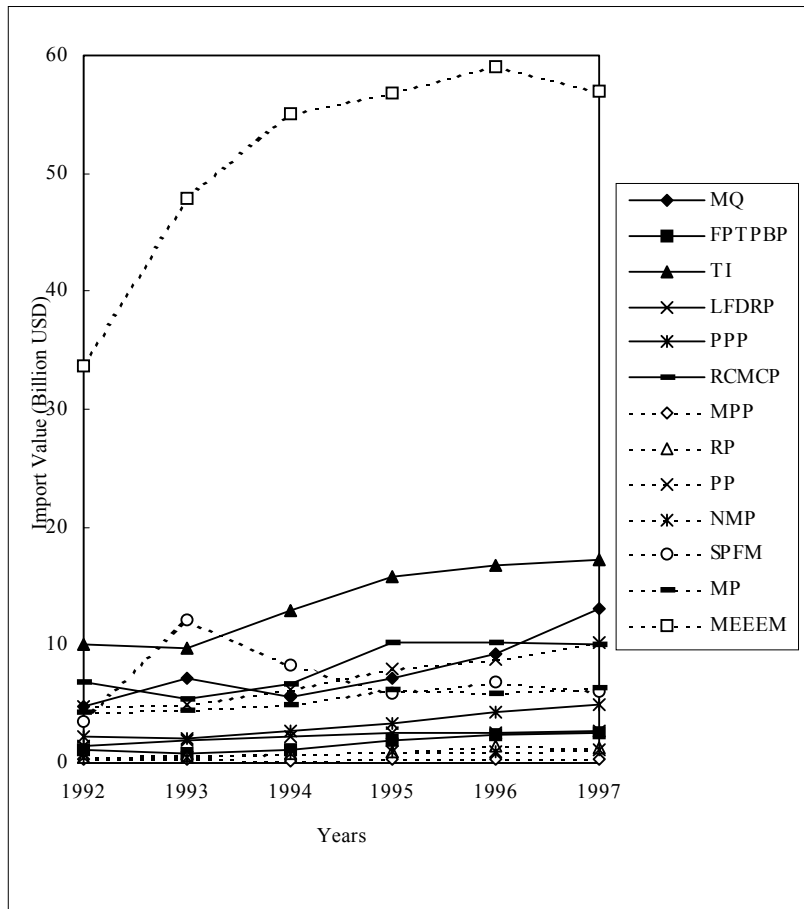


Figure 2-2 Import Value of Major Industrial Sectors in China

Source: China Statistics Yearbook, 1993-1998, China Statistics Yearbook Press.

The goal of developing import in China is to meet the needs of people's life and economic construction. The import trade has been influenced by the development of domestic industrial sectors, mainly including the imports of raw materials, machinery equipment, and cereals, oil and foodstuffs, and has concentrated on a few staple products, such as steels, aluminum, copper, iron sands, fertilizers, raw chemical materials, cotton, timber, paper pulp, machinery, wheat, sugar and etc.. The import of industrial manufactures in 1985 has been up to US\$36.9 billion, with the percentage of 87.7 in the total import; US\$43.5 billion in 1990 with the percentage of 81.6; and US\$158.767 billion in 1997 with the percentage of 86.9.

According to customs statistics, China's import in recent years has been developing swiftly (see Fig. 2-2). In 1995, China's top five industrial sectors with largest import value are: MEEEM, TI, RCMCP, PP and MQ(see Table 2-3). According to the total

import value from 1992 and 1997, the top five industrial sectors with largest import value are: MEEEM, TI, RCMCP, MQ and PP.

## 2.2 Impacts of trade development in China's key industrial sectors on the environment

There is no statistic data on the quantity of pollutants discharged by export trade enterprises, so there is no way to directly get any information on pollutants caused by export products. As China's industrial production is closely related to the pollutants discharge, and furthermore, the industrial development is closely related to the export trade, we decide to use the national statistics on the export value of industrial sectors and the pollutants discharge per 10,000 RMB to analyze the trend of pollutants discharge of export products in some industrial sectors.

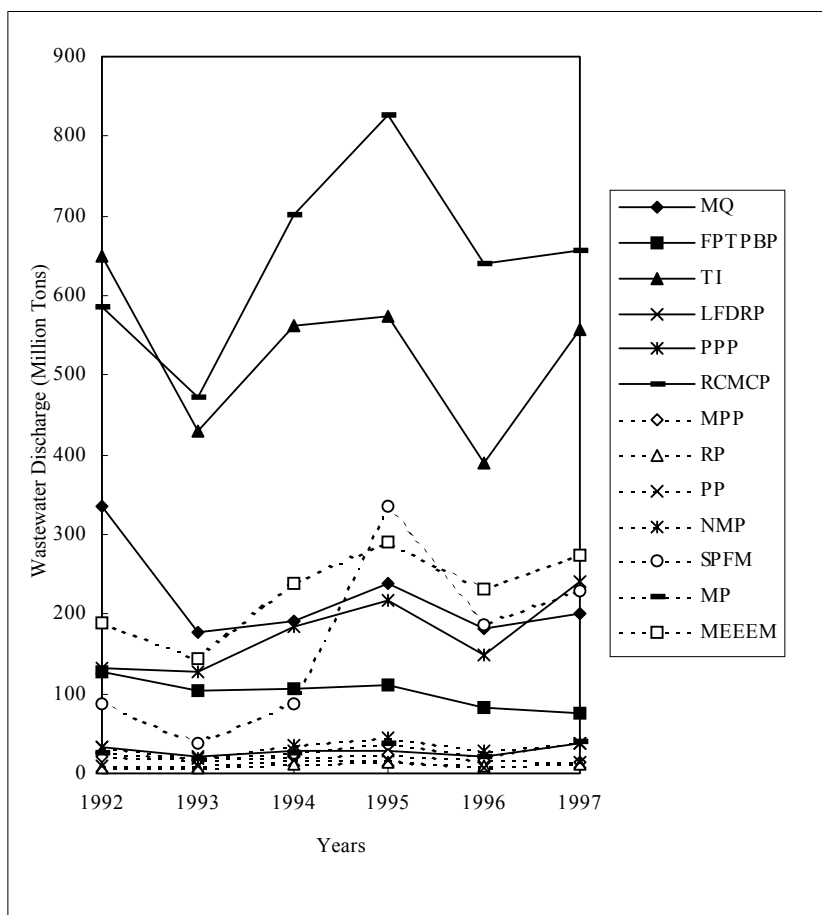


Figure 2-3 Wastewater Discharge of Export Products in Industrial Sectors

Source: China Statistics Yearbook, 1993-1998, China Statistics Yearbook Press;

China Environment Yearbook, 1993-1998, China Environment Yearbook Press.

### ***1) Waste Water Discharge of Export Products***

From Figure 2-3, we can find that the quantity of wastewater discharge of Export Products is keeping or ascending when the export trade value is increasing in most sectors. Among those sectors, RCMCP and SPFM have increased by a large margin. The sectors, which their export products have discharged most wastewater over those years, are in turn as the following: RCMCP, TI, MQ, MEEEM, MQ, PPP and SPFM.

### ***2) Waste Gases Emissions of Export Products***

Seen from Figure 2-4, we can find that the waste gas emissions of most export products (except TI) ascend while the export values in most sectors are increasing, among which SPFM and RCMCP have risen with a larger margin. The sectors, which their export products emit most waste gas emissions over years, are in turn as the following: RCMCP, SPFM, NMP, TI, MEEEM, and MQ.



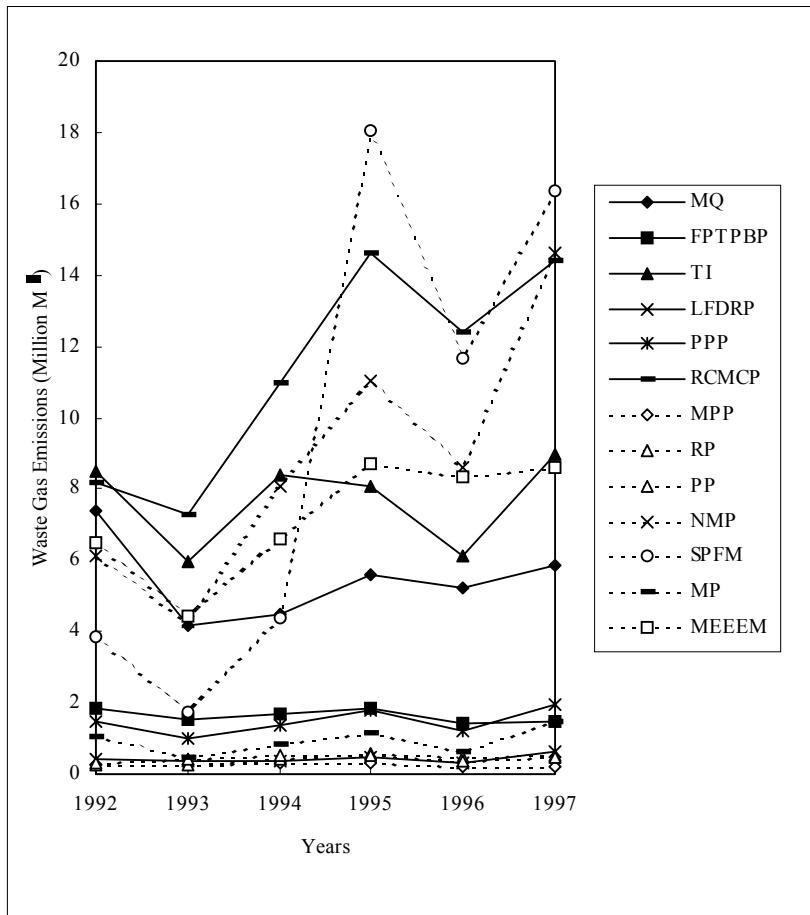


Figure 2-4 Waste Gases Emissions of Export Products in Industrial Sectors

Source: China Statistics Yearbook, 1993-1997, China Statistics Yearbook Press;  
China Environment Yearbook, 1993-1997, China Environment Yearbook Press.

### 3) Solid Wastes Produced by Export Products

Seen from Figure 2-5, we can find that the quantity of solid wastes is keeping or ascending while the export values of most sectors are increasing. Among them, there is a larger increase in MQ and SPFM. The sectors, which their export products has produced the most solid wastes over years, are in turn as the following: MQ, SPFM, RCMCP, TI and MEEEM; however, that of other sectors are nearly keeping constant.

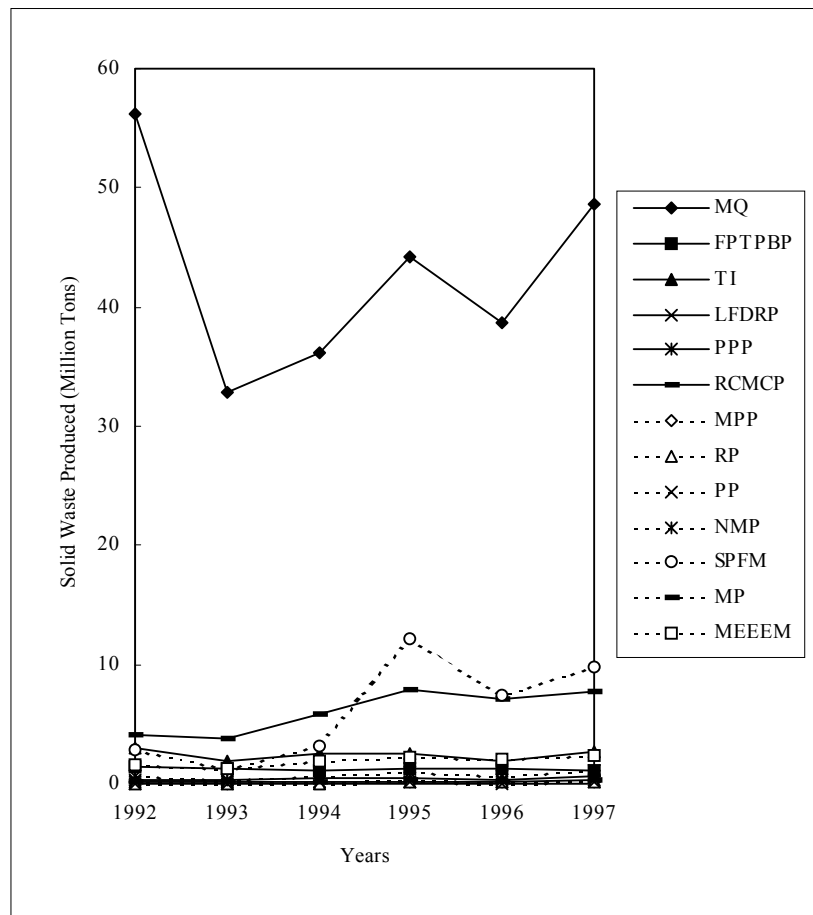


Figure 2-5 Solid Wastes Produced by Export Products in Industrial Sectors

Source: China Statistics Yearbook, 1993-1998, China Statistics Yearbook Press;  
China Environment Yearbook, 1993-1998, China Environment Yearbook Press.

Figure 2-3 and Figure 2-5 just show a relative relationship between the pollutants discharges and the foreign export trade and each of them only illustrates trends of changing. Generally speaking, the degree of environmental pollution has also increased a little when the export trade in industrial sectors has increased rapidly.

In the recent years, China's export and import has make a great progress, such as MEEEM, TI, RCMCP, MQ and PP, which occupy the pivotal position. The pollutants discharged by China's major export sector have also increased with the growth of export volume. From this view, the environmental impacts of expanding export are rather larger, which is one of causes of developing China's tremendously environmental pressures. On the other hand, the growth rate of pollutants discharged by major export trade is basically lower than that of export, which also indicates that the pollution treatment level has been

improved while expanding export trade.

From the analysis of this chapter, the export of China's textile industry has always kept at a very high growth rate. At the same time, the pollutants discharged by textile export are also at a serious level, so TI sector has become the main object chosen for case study. While the export trade in the leather and fur industry is increasing smoothly, its waste gases and solid wastes also appear stable growth trend and its wastewater discharge volume increases very rapidly, which are the cause of choosing another case study. Seen the analysis from Fig. 2-3 and Fig 2-5, some sectors whose exports are developing rapidly, the pollutant discharge volume from export production process is also relatively large. The types of pollutants from export production are also closely related to the production characters. For example, the solid wastes discharged by MQ and SPFM is the largest, and the wastewater discharged by RCMCP and TI are the largest.

## **2.3 China's experiences and efforts to promote trade and environment**

### ***1. Greenfood development in China***

Many countries, especially developed nations, have set more rigorous food standards and harsh terms on pesticides residues and harmful chemicals on food imports. Stringent restrictions are also placed by some countries on domestic animal drug residues. Because of the persistent effects of the residues of agricultural chemicals in soil and the irrational use of fertilizers, many entry rejections have been registered as a result of Chinese exporters' failure to meet the hygienic or safety standards of the importing countries.

Due to environmental pollution, ecocide and predatory fishing, catching and extraction, some major foreign exchange-earning resources of the past have been widely destroyed or almost dried up. The cases in point are the Chinese prawn and the Yangtse River crab. Exports are affected not only by pollution in plant growth, livestock and poultry feeding and fishing, but also by contamination in processing and transportation.

In early 1980s, the Chinese government advanced the idea of building up eco-agriculture in the country. The development of greenfood aims to push forward this national eco-agriculture.

The system of China's greenfood standards contains a complete set of quality control

standards, including environmental quality standards, operation procedures, products standards, packaging criteria, storage and transport benchmarks as well as other related standards.

While China's food exports grew rapidly, its export structure and markets also experienced a great deal of changes, which is featured mainly by the following aspects: a sharp increase of high-valued food exports and slow export growth rate of necessities relating to people's livelihood.

## ***2. China's Ecolabelling Programme***

The work on the establishment of an ecolabelling programme in China started in 1993. The Certification Committee for Environmental Labelling of Products was established in May 1994. Since then, a series of working rules have been adopted and specifications and criteria for twelve product categories issued. 358 products of 88 manufacturers had been awarded the label by the end of 1998.

However, the awareness of the environmental label does not appear to be very high. The label is not very well known among domestic consumers. Efforts should be made to disseminate information on the environmental labelling through television, broadcasting, newspaper as well as press conference.

Although ecolabelling may create potential trade barriers, it may also create positive trade effects. China should actively disseminate information about its programme to the potential importers of Chinese goods and to consumer organizations in other countries, in order to increase foreign awareness of and credit for China's ecolabel. China should also exploit the potential of ecolabelling to respond to increased green demand and to expand its production of environmentally friendly products.

## ***3. The implementation of the ISO 14000 series of standards in China***

To guide the enforcement of the ISO 14000 series of standards, the Chinese government will set up the National Steering Committee for Certification of Environmental Management System. For the technical support of the implementation of the ISO 14000 standard series, the State Environmental Protection Administration has established the Centre for Environmental Management.

Pilot work on the certification of environmental management system is going on now in China. By the end of 1998, 84 enterprises of different types and sizes has been approved by ISO 14000 certification committee of China.

Because of the differences in economic development, cultural backgrounds, and legislative systems in different countries, different approaches for the implementation of the ISO 14000 standard series should be considered in accordance with the conditions of the country. China will participate in international efforts in establishing international mutual recognition mechanism for the accreditation of certification of environmental management systems.

#### ***4. The implementation of Montreal Protocol in China***

China signed the Vienna Convention for the Protection of the Ozone Layer and the London Amendment of the Montreal Protocol on Substances that Deplete the Ozone Layer in 1989 and 1991 respectively.

For the coordination of implementation activities of different governmental agencies, a National Leading Group for Ozone Layer Protection with SEPA as the head was set up in 1992. Technological support institutions in the sectors of chemical industry, industrial and commercial refrigeration, household refrigeration and solvent cleaning, etc. have been established.

In 1992, the Country Programme for the Phaseout of Ozone Depleting Substances and phaseout strategies and action plans for nine sectors have been worked out, including the sectors of chemical industry, halon, industrial and commercial refrigeration, household refrigeration, solvent, aerosol, foam, plastic, mobile air conditioner and tobacco.

The Government of China will strictly adhere to the provisions of the revised Montreal Protocol and take the responsibility to fulfill the obligations for the phaseout of ODS production and consumption in China, provided sufficient funds are made available and needed technologies are transferred in accordance with the provisions of the Montreal Protocol.

Concerning the problem of pollution haven, a preliminary study has been carried out to

investigate the current situation of FDI to China related to the production and consumption of ODS. Preliminary evidence showed that developed countries have used FDI as a means to meet legal obligations related to the phaseout of ODS by shifting production towards developing countries. The joint ventures with TNCs generally pay more attention to the protection of the environment.

## Chapter Three

# Trade and Related Environmental Issues in China's Leather Industry

### 3.1 China's leather import and export

#### 1. Leather products as a major export item

Leather industry in China is an export-oriented industry. Leather export grew drastically in the 1990s and hit \$10 billion in 1997, five times over 1990. Despite the serious impact of the Asian financial crisis on China's export, leather export still grew over 10 percent in the first half of 1998. Chinese Customs Statistics in 1997 show that, among the 100 leading export goods, leather products rank the sixth in terms of export volume; shoes and boots with leather upper rank the second with export volume at \$3.82 billion; leather garments rank the fifth with export volume at \$1.37 billion; suitcases and handbags with non-leather cover rank the sixth; sports shoes with leather upper rank the 18<sup>th</sup>; leather suitcases and handbags rank the 73<sup>rd</sup>; and leather safety gloves rank the 89<sup>th</sup>. In 1997, export volume of shoes with leather upper increased 22 percent over 1996, and export volume of leather garments increased 11.2 percent over 1995. Meanwhile, export unit price of leather shoes and garments on average has been on the rise. This indicates that leather products for export have not only increased in volume, but the quality is also improving. Leather shoes, garments, suitcases and handbags represent a major component of China's export. Table 3-1 shows the quantity and volume of major leather products for export in 1997.

**Table 3-1: Export Quantity and Volume of Major Leather Products, 1997 (Unit: \$1,000)**

Major products	Unit	1997		1996		Increase/ decrease over 1996 (%)	
		Quantity	Volume	Quantity	Volume	Quantity	Volume
Leather shoes	10,000 pairs	62769	3637906	52610	2981292	19.3	22.0
Travel goods, suitcases & handbags		-	3297414	-	2711819	-	21.5
Leather garments	10,000 sheets	4504	1602757	4136	1440980	8.9	11.2
Fur coats	Ton	1736	110186	1858	126170	-6.5	-12.6
Leather gloves	10,000 pairs	58731	482945	50739	433298	15.7	11.4
Football, volley ball & basket ball	10,000	4274	78780	3935	78036	8.6	0.9
Leather & raw hide (excl. fur)	Ton	-	353118	-	330199	-	6.9
Shoes/boot parts & similar items	Ton	63427	390740	56801	398138	11.6	-1.86
Total		-	9953846	-	8499932	-	17.11

Source: *Statistical Yearbook of the Chinese Customs, 1996*, published in 1997.

Thanks to the sharp increase in the export of leather products, China's share in the world export of leather goods has grown and exceeded 10 percent today. However, we must recognize that, despite increasing export volume, most of the export products remain in the middle and lower end of the market with low value-added. Take the US market as an example. More than 50 percent of the leather-upper shoes exported by China is sold in the US market. Chinese leather-upper shoes have a market share of 60 percent in the US in terms of quantity but only 40 percent in terms of value. The unit price of a pair of Chinese leather shoes is \$7.10 on average, the lowest in the market, while Italian shoes charge the highest price, \$23.80 a pair on average and more than the combined price of three pairs of Chinese shoes. To increase export and foreign exchange income, China must further improve the quality of its export products and gain access to the higher end of the market.

While leather products constitute a major component in export, China's import of leather goods is relatively insignificant. Statistics show that the import volume of leather products in 1997 was only \$186 million, equivalent to 1.9 percent of China's export of leather products in the same year. Major leather products imported include high-quality shoes, handbags and fur coats to meet the needs of a small group of high-income earners.



## **2. Leather as a major import item**

Leather is the major material for making leather shoes, handbags and garments. China's leather industry has experienced remarkable growth over the last few years. With growing demand in the domestic and overseas market and transfer of the world leather production, China has emerged as a major leather processing and trade center. In the last couple of years, China's annual production of leather exceeded 90 million sheets (converted to cattle hide).

Most of the tanneries in China were set up in the 1950s and 1960s. They are generally small in size with obsolete equipment and relatively low technical level. In the 1980s, some of those tanneries undertook technical upgrading and imported key equipment from abroad with the help of government lending or foreign investment. Particularly in the last few years, some of those tanneries kept expanding and improving quality through joint venture with foreign companies. The capacity of the leather industry in general can meet domestic demand. The quality and variety of the products, however, are far from satisfactory. Leather used for making high-quality products is mostly imported from abroad. Statistics provided by the China Leather Industry Association show that 80 percent of the leather used in China is produced locally while 20 percent and high-quality cattle hide in particular is imported from overseas. The shortage of high-quality cattle hide in China is attributable to the constraints in the cattle raising industry: insufficient number of cattle raised; and lack of supply of high-quality raw hide. In the short term, China's dependence on import for high-quality cattle hide is not likely to change.

China's import of leather grew significantly since 1993. According to the Chinese Customs Statistics, China imported 421,100 ton of leather worth \$1.58 billion in 1993; and it imported 555,200 tons of leather worth \$1.986 billion in 1994, up 31.8 percent and 25.7 percent respectively over 1993. In 1997, China imported 730,300 tons of leather worth \$2.495 billion, another increase of 31.5 percent and 25.6 percent respectively over 1994. It is worth noting that the quantitative growth of leather import far exceeded the growth of import value in recent years. This indicates that the declining price of imported leather is an important factor for the significant increase in leather import.

Tanned leather takes the lion's share or 85 percent of the leather import, while raw hide ranges only between six to 15 percent. Import of patent leather and regenerated leather makes up less than two percent respectively. Cattle leather accounts for about 80 percent of the import.

Compared with import, China's export of leather is relatively limited in terms of both quantity and volume. The recent increase in leather export is mainly attributable to the increase in the re-export of leather made from imported raw cattle hide. For a considerably long period of time, leather export is not likely to grow significantly and catch up with import in either quantity or volume.

### **3.2 The current status of the leather industry in China**

Leather industry in China consists of four major components: tanning, leather shoemaking (including sports shoes), leather goods (including leather garments) and fur, supplemented by the supporting industries such as leather making machinery, leather-processing chemicals, metal parts and accessories for leather shoes.

In China, there are about 16,000 leather enterprises (excluding village-run enterprises, cooperative enterprises and individual businesses with annual sales below 1 million yuan RMB) which employ over 2 million people. Of the 16,000 enterprises, over 9,500 or two thirds are at or above the township level and play a major role in the industry. About 6,000 or one third are village-run enterprises, cooperative enterprises or individual businesses (referred to as village-run enterprises) with annual sales above Rmb 1 million yuan and represent the newly emerging players with potential in the industry. The leather industry consists of about 2,300 tanneries, 8,200 shoemaking enterprises, 1,700 leather garment producers, 1,200 fur and fur goods producers, 523 suitcase producers, and 1,501 handbag producers. The leather industry generates Rmb 152.5 billion yuan in total output value, Rmb 135 billion yuan in sales revenue, Rmb 3 billion yuan in tax payment and Rmb 2.5 billion yuan in profits. The leather industry in China today has the following characteristics:

**1. The fittest survives. Enterprise restructuring is unfolding. The leather industry is shifting its focus from quantity to quality.**

Since China embarked on reform and opening, the leather industry has experienced the best period of development. As it is now in a phase of sustained and steady growth, there are also signs of a slowdown. Through the self-reliant preliminary growth phase (1949-1977) and re-development phase (1978-1997), the leather industry has basically formed a relatively complete industrial system of considerable scale integrating production, R&D and staff training. The industry has reached a record level in terms of output, quality, profitability and tax payment, and export revenues, and turned China into a major, though not a powerful, leather producing country in the world. The characteristics of these two phases are: Influenced by small-scaled production and small farmer's mentality, producers are scattered around and poorly managed; and the leather industry remained focused on quantity and thus unable to meet the requirements of the market economy. With change in the growth model, the leather industry has been experiencing a shift from quantity focus to quality and efficiency focus in the last couple of years. Leather producing enterprises are paying more attention to the brand name effect and seeking to reap its potential benefits. It is worth noting that the "genuine leather tag" campaign as well as the nomination of "ten major genuine leather garment kings" and "ten genuine leather shoe kings" promoted by the China Leather Industry Association greatly raised the brand awareness throughout the industry. Objectively speaking, a climate has been created in the industry for enterprises to compete to establish brand names. This new initiative in the leather industry has helped facilitate the shift from quantity focus to quality and efficiency focus.

**2. The leather industry has experienced a process of gradual consolidation. A large number of villages and townships (areas) specialized in tanning, shoemaking and accessories have emerged. Leather markets are under construction or established.**

With development of the leather industry over the past decade, a large number of villages and townships (areas) specialized in tanning, shoemaking and accessories have emerged, such as Haining and Wenzhou in Zhejiang, Lixian, Xinji and Wuji in Hebei, Sangpo in Henan, Liaoyang in Hunan, Tongerbao in Liaoning

and Chenji in Shandong. They have become production and distribution centers for leather products. Some of them have reached the highest domestic level of processing technology. In addition, a large number of leather trade cities and markets are under construction; and some have reached considerable scale, such as Zhejiang Leather Garment City, Xinji Leather Commerce and Trade City, Lixian Leather and Fur Trade Market, Wenzhou Shoes City and Sichuan Leather Market. 70 percent of the leather enterprises are located in the east, central and south parts of China.

### **3. Foreign-invested enterprises play an important role in the leather industry.**

As an outcome of the reform and open policy, foreign-invested enterprises are the new and most dynamic group in the leather industry. From non-existence, they have grown rapidly and reached a considerable number and scale today. State statistics show that there were 2,173 foreign-invested enterprises of various types by the end of 1997 and account for about 23 percent of the total number of enterprises at or above the township level. They specialize in tannery, shoemaking, leather garments, leather suitcases, leather goods, fur and other related products. 218 of these enterprises are solely owned by foreign companies; 618 are joint ventures between Chinese and foreign companies; 354 are solely owned by companies based in Hong Kong, Macao or Taiwan; and 991 are joint ventures between companies in the mainland and Hong Kong, Macao or Taiwan. 61.8 percent of the foreign-invested enterprises is either solely or partly owned by companies based in Hong Kong, Macao or Taiwan. In terms of number, foreign-invested enterprises makes up a quarter of the industry. In terms of assets, they rank the first of all types of enterprises by representing 52 percent of the total assets of enterprises at or above township level, with 31.2 percent owned by collective enterprises, and only 12 percent owned by state-owned enterprises. In terms of sales and export, foreign-invested enterprises account for 41.5 percent of the annual sales of the whole leather industry and 37 percent of the foreign exchange revenues of the country. Their export of leather shoes alone accounts for 87 percent of the total leather shoe export and is seen as the pillar of the industry.

### **4. There are large supplies of pig and sheep hide but short supply of cattle hide. Quality of raw hide needs improvement.**

Today China produces about 80 million sheets of pig hide annually and ranks the first in the world (though the utilization rate of pig hide is only about 20%); and about 40 million sheets of sheep hide and is one of the largest sheep hide producing countries. Thanks to the significant development of the cattle raising industry in recent years, production of cattle hide has been increasing and reached about 12 million a year. But this is only enough to supply 15 percent of the processing capacity. Through consistent efforts over the years, the leather industry has achieved considerable improvement in the quality of products. With the exception of pig leather garments, however, the quality of cattle and sheep hide is generally low, and the variety of products is not able to meet the market demand. Particularly raw cattle hide is in short supply. Given this situation, China is making greater efforts to develop cattle raising by building meat cattle production bases in many areas, such as Puyang in Anhui, Qinchuan in Shaanxi and Zhoukou in Henan. Despite this, the shortage of raw cattle hide is not likely to improve in the near future. Large quantities of

import are inevitable.

### **3.3 Major environmental problems associated with the leather industry.**

While promoting the rapid growth of leather production and export, we should also recognize the environmental problems associated with this process. The leather industry is based on leather tanning, which is one of the three worst polluters in light industry. The tanning process discharges large volume of wastewater with high content of organism and humidity, causing serious pollution to the environment and water in particular and representing the major source of pollution in the leather industry. Statistics show that the leather industry discharges 100 million ton of wastewater a year, about 0.4 percent of the total discharge of industrial wastewater in China. Solid waste, which includes waste hair, membrane, bits and sheets of hide, leather and leftover materials, and sludge and sediments of the tanning process, is another source of pollution in the leather industry.

#### **1. Water pollution in the leather industry.**

As shown by the evolution and current status of the world leather industry, it is not an easy task to solve the problem of wastewater discharged by tanneries, which is therefore the key to the realization of clean production in the tanning sector. The level of wastewater pollution in China is much higher than that of the industrial countries.

The quality of untreated wastewater discharged by tanneries in China today is indicated below:

SS: 3000mg/L

BOD<sub>5</sub>: 1500-2000mg/L

COD<sub>Cr</sub>: 3000-4000mg/L

PH Value:8-10

Cr<sup>3+</sup>:40-100mg/L

S<sup>2-</sup>: 100-200mg/L

According to the comprehensive standards of the People's Republic of China for wastewater discharge GB8978-1996, the acceptable quality of wastewater discharged by tanneries should be:

SS: 200-400mg/L

BOD<sub>5</sub>: 150-600mg/L

COD<sub>Cr</sub>: 300-1000mg/L

PH Value:6-9

Cr<sup>3+</sup>:1.5mg/L

S<sup>2-</sup>: 1.0-2.0mg/L

It shows that the quality of untreated wastewater discharged by the tanneries in China has generally exceeded the national standards. More seriously, according to a survey conducted by the China Leather Industry Association, only 10 percent of the tanneries treat their wastewater and have met the national standards, while 90 percent basically do nothing about the wastewater..

## 2. A survey and analysis of the wastewater and sludge treatment of 100 tanneries.

For the purpose of gaining a better understanding of the water pollution problem associated with the Chinese tanneries, we selected 100 typical tanneries from a total of 2,300 and made a survey focused on wastewater, sludge and treatment.

**Table 3-2: Survey of 100 Domestic Tanneries on Wastewater and Sludge (Summary)**

Locality		East China	South China	North China	Central China	Southwest	Northwest	Northeast	Subtotal
Number		29	11	15	16	13	12	4	100
Ownership	State-owned	7	5	3	6	3	7	2	33
	Collective	13	1	1	4	10	2	1	32
	Individually-owned	2	0	10	4	0	1	0	17
	Joint Venture	7	3	1	2	0	1	1	15
	Foreign-invested	0	2	0	0	0	1	0	3
Size	Large <sup>(a)</sup>	5	2	0	1	2	0	0	10
	Medium-sized <sup>(b)</sup>	21	9	7	8	5	12	4	66
	Small <sup>(c)</sup>	3	0	8	7	6	0	0	24
Product	Cattle hide	11	11	3	13	8	11	4	61
	Pig hide	15	5	1	3	10	2	2	38
	Sheep hide	6	0	13	5	5	8	1	38
Waste	Direct discharge <sup>(d)</sup>	4	1	1	0	7	9	1	23
	Partial Treatment	3	4	1	2	3	1	2	16
	Full treatment	22	6	13	14	3	2	1	61
Sludge treatment*	Directly discharged	1	0	0	0	0	0	0	1
	Pile up	17	3	2	16	5	2	3	43
	Used as Fertilizer	2	2	2	0	1	2	0	9
	Buried	14	7	14	7	3	1	0	46
	Burned	0	0	0	1	0	0	0	1
	Used as building material	5	1	1	0	0	0	0	7
	Used as animal feed	0	0	0	0	0	0	0	0

Note:

- a) Large tanneries refer to those with annual capacity of 1 million sheets of hide. The survey covered 100 percent of such tanneries.
- b) Medium-sized tanneries refer to those with capacity from 100,000 to 1 million sheets of hide. The survey covered about 10 percent of such tanneries.

- c) Small tanneries refer to those with capacity of less than 100,000 sheets of hide. The survey covered about 1.5 percent of such tanneries.
  - d) Including those tanneries with wastewater treatment facilities both under construction and in operation.
- \* The survey on sludge treatment methodology only covered those tanneries with wastewater treatment. Tanneries using various sludge treatment methods are all included.

### **(1) Overview**

Influenced by a variety of factors including the source of raw hide, level of economic development, technical capacity, traditional mentality, management, reform and open policy in different regions, the tanning sector has formed its own unique pattern of distribution. Tanneries are located primarily in Zhejiang, Jiangsu, Shandong, Henan and Hebei in the east, central and north China and secondly in Shaaxi, Gansu, Xinjiang, Sichuan, Yunnan, Guangdong and Guangxi in the northwest, southwest and south China. Northeast has the least tanneries (see Table 3-2). For the purpose of environmental protection, the polluting tanneries have been relocated from larger cities to smaller cities, townships and villages. Today, very few operating tanneries can be found in the major cities, such as Beijing, Shanghai, Tianjin and Chongqing.

### **(2) Wastewater**

#### a. Wastewater discharge:

We made a comparison between production and wastewater discharge using the data collected from 21 tanneries specialized in pig hide, 29 tanneries in cattle hide and 16 tanneries in sheep hide selected from the 100 tanneries. The findings indicate that wastewater discharge averaged 43 ton for a ton of pig hide with a range from 40 to 50 ton; 76.1 ton for a ton of cattle hide; and 40.9 ton for a ton of sheep hide. This has all exceeded the international standard of unit water consumption, i.e. 30 to 40 ton of water for a ton of raw hide for average tanneries. Obviously, water saving and reduction of wastewater discharge are important factors for consideration in addressing the pollution problem of tanneries in China.

#### b. Wastewater treatment

The findings show that tanneries can be divided into three groups regarding wastewater treatment:

Group I: direct discharge, 23 percent of the samples. Most of the tanneries in this group are located in the less developed northwest and southwest regions that are lagging behind in environmental protection. 75.8 percent of the sampled tanneries in the northwest and 54 percent in the southwest discharge their wastewater directly without any treatment.

Group II: partial treatment, 16 percent of the samples. Though some of the tanneries in this group do not have treatment facilities, they recover and treat the used depilatory and chromium liquor, both heavy pollutants, before discharge.

Group III: full treatment, 61 percent of the samples. The tanneries in this group not only manage their production well but also pay great attention to the environment. The distribution of tanneries with full wastewater treatment in the samples in different regions is: 75.9 percent in east China, 54.5 percent in south

China, 86.7 percent in north China, 87.5 percent in central China, 23.1 percent in the southwest, 16.7 percent in the northwest and 25 percent in the northeast.

### **(3) Sludge**

The findings show that none of the tanneries sampled has measured the water content in the sludge. Because of the different ways of handling the sludge from the wastewater tank, sludge varies in form, and its water content ranges from 30 to 98 percent. Current priority is given to wastewater treatment. Sludge left over after wastewater treatment has not received sufficient attention. Most of the tanneries do not have sludge treatment facilities. Sludge left over after wastewater treatment usually contains a lot of water and is difficult to transport.

### **(4) Conclusion**

Compared with industrial countries, China is a late comer in environmental protection. Findings of the survey show that waste treatment in the Chinese tanneries has been focused on end of pipe treatment of wastewater and promotion of wastewater treatment methods that require less investment, produce quick results, are easy to adopt and do not cost much to operate. A considerable number of tanneries do not conduct full wastewater treatment due to its high cost. Furthermore, sludge generated at the end of wastewater treatment and resultant pollution has not aroused sufficient attention. It is regarded only as general industrial waste. This shortsighted approach is not recommendable.

Based on the survey findings and analysis of the 100 tanneries, we make the following recommendations:

Treatment of environmental pollution in tanneries should address both the root causes and symptoms, with the focus on the former. That means to realize clean production at the source of pollution in leather enterprises. Technology appropriate for the Chinese leather enterprises at their present level should be adopted to reduce wastewater discharge and consumption of material and energy, control pollution and lower the cost of waste treatment at the end of the production process. This will not only help raise productivity and profitability but also improve the environment.

### **3. Pollution problem associated with leather products.**

While tanneries are the heavy polluters, the production of leather products causes much less pollution and environmental damage. Adhesive is the main source of pollution in the production of leather shoes, garments and goods. As an important auxiliary, it is used extensively and in large quantity in the leather garments industry in China.

Solvent-based adhesives are normally used in leather garments production. Solvents including gasoline, benzene, toluene and dimethyl benzene vary in the time and degree of volatilization under different temperature and humidity. Benzene, toluene and dimethyl benzene are harmful to human health. Pollution caused by adhesives is a pressing problem in the leather industry in China today.

#### **3.4 Adjust industrial policy and promote harmonious development of the environment and trade in search of a road to sustainable development.**

Since the late 1980s, the world has witnessed a transfer of the leather industry from the industrial countries

to the developing countries. In the last few years, China has become a processing and trade center for leather products in the world. However, we must recognize that pollution is an important factor for this transfer. Over the years, the leather industry in China has made great progress and contributed considerably to the economy. But it has also become a heavy polluter. For this reason, it is critical to emphasize development and treatment at the same time. As a developing country, China should make full use of its large supplies of raw hide to develop production, increase efficiency and generate foreign exchange revenues. At the same time, it must not seek short-term benefits at the cost of the environment. Environment is a major concern that has an impact on our children and provides the basis for the country's sustainable economic and social development. As we are moving into the 21<sup>st</sup> Century, we are facing both opportunities for economic development and major challenges of pollution. Leather industry is a growing industry in China, as well as a polluting industry. The key to a fundamental solution to the pollution problem and the realization of re-development of the leather industry lies in the harmonious development of trade and environment. This is a new task facing leather industry today.

Sustainable development as a general national strategy for economic and social development poses a major challenge to the traditional leather industry. Sustainable development consists of sustainable development of the natural resources and biological environment, sustainable economic development and sustainable social development. Sustainable exploration of the natural resources and sound biological environment form the basis; sustainable economic development provides the prerequisite; and overall social progress is the goal. In this sense, sustainable development of the leather industry and coordination of the environmental and trade policies call for action in the following three areas:

## **1. Industrial policy and measures**

### **(1) Optimize the industrial structure and set the objective for sustainable development of the leather industry.**

In pursuit of the basic national strategy of sustainable development, the government has formulated the program for the development and pollution prevention and treatment for the leather industry during the 9<sup>th</sup> Five-Year Plan and until the year 2010. The general objectives of this program are:

- Maintain appropriate growth, with the focus on optimization of the industrial structure;
- Improve product quality, develop new products, and increase product variety to meet the demand of different consumer groups in China and increase export;
- Rely on technological advancement, introduce advanced technology and equipment, accelerate technical upgrading of the enterprises and modernize the production process over time;
- Take a market-oriented approach and facilitate simultaneous development of the animal husbandry and leather industry;
- Build up production bases for high-quality raw hide;
- Develop the production of specialized leather-processing chemicals and new auxiliary materials;
- Base on the leather tanning and take the leather and leather products as leading products to



achieve overall improvement of the quality of products.

During the 9<sup>th</sup> Five-Year Plan, greater efforts should be made to intensify pollution prevention and treatment, promote comprehensive utilization, realize clean production and reduce environmental pollution. By the end of 1997, wastewater discharged by tanneries into the Huai River was required to meet the national or local standards. By 2000, wastewater discharge of the tanneries in the whole country are required to meet the national or local standards, so as to bring water pollution problem of the tanneries basically under control.

## **(2) Adjust industrial policy and improve product quality.**

Thanks to consistent efforts over the years, leather industry in China has achieved significant improvement in quality. Leather made from pig hide, in particular, became a special feather of China. Chinese leather garments made from pig hide enjoy a high reputation internationally. Generally speaking, however, the quality of leather made from cattle and sheep hide, with the exception of pig hide, needs improvement; and the varieties of products do not yet meet the needs of the market. It should be recognized that, under the market economy, the leather industry in China is in the process of a shift from a quantity focus to a quality focus, with an increasing number of leather producers paying more attention to brand name effect. Yet this is only the start and a far cry from meeting the needs of the domestic and overseas markets. In order to further promote a market-oriented approach, develop high-quality, low-price and marketable products and increase the varieties, we must readjust the industrial policy to encourage those products and industries with high market potential, restrict those products in excessive supply and enterprises lacking economies of scale, and close down those enterprises that endanger the environment.

## **2. Environmental policy and measures**

### **(1) Realize clean production and ensure harmonious development of the economy and environment.**

Pollution associated with tanneries is a difficult problem in both China and abroad. Tanneries discharge large volume of water with complicated elements. According to conservative estimates, tanneries in China discharge more than 100 million ton of wastewater a year while many cities and regions suffer from a water shortage. Without control of the water consumption and pollution by tanneries, it would inevitably lead to disastrous consequences to ourselves and our children.

An end of pipe approach was taken to wastewater treatment in tanneries in the past. It has been proved that end of pipe treatment is not only costly (In Japan and Korea, the cost of building a primary wastewater treatment station is equivalent to Rmb 15,000 yuan per ton, and operating cost is equivalent to Rmb 14 to 20 yuan per ton. In China, the initial investment in end of pipe treatment requires Rmb 105 billion yuan, and operating cost exceeds Rmb 100 million yuan.) but also time-consuming. Yet the result is not satisfactory and often does not meet the standards. Since pollution treatment is costly and has nothing to do with an enterprise's financial performance, many enterprises lack the incentive and enthusiasm to tackle pollution. During the last few years in particular, individually owned businesses have mushroomed all over the country. Many of those enterprises do not have any pollution control measures. They discharge

wastewater unscrupulously into the rivers and lakes and pose a serious threat to the water supply for irrigation and for households. Consequently, end of pipe treatment is not consistent with the principle of sustainable development.

To tackle the pollution associated with leather industry, we must start with basic research and promotion of clean technology to ensure harmonious development of the economy and environment. The term *clean production* was first raised by the United Nations Environment Program in 1989, and has become a global trend today. The *Ten Approaches to the Environment and Development in China* emphasizes clean production, which is a major element in the strategic shift in pollution control and treatment in China and constitutes important measures and techniques for the implementation of the sustainable development strategy. Clean production is the best approach to facilitating changes in the production and environmental management of the traditional industries. It requires not only that zero or less pollution be realized in the production process, but also that the end products cause no environmental damage in use and eventual disposal. Through implementation of clean production, it forces us to revisit the various steps including design of the product, selection of material, technical renovation, technological advancement and production management. On the one hand, it can eliminate industrial pollution as much as possible in the production process, and, on the other hand, it can help producers reduce production costs and improve financial performance.

In essence, application of clean production to the leather industry is to apply the ISO 14000 Environmental Quality Management System, which is an inevitable trend. To facilitate the change in economic growth model and improve environmental management, the Chinese government started to implement the ISO 14000 Environmental Management System Standards in 1996. In order to implement the ISO 14000 Environmental Management System Standards (EMSS) in a vigorous and steady way, the State Environment Protection Agency conducted a pilot project on certification of EMSS in selected enterprises. 13 cities got approval to participate in the pilot project, and certification was carried out in 55 enterprises in three batches. As proved by the results of the pilot project, the implementation of the ISO 14000 Environmental Standards can help make the environmental management techniques and measures of the leather industry more scientific and standardized, and contribute tremendously to the progress of the tanning sector, harmonious development of the foreign trade and environmental protection, and steady improvement of the environmental quality in China.

The key to the implementation of clean production in the leather industry lies in technological advancement, promotion of the technological policies conducive to the environment and application of the clean technology. These technological policies include:

(a) Focus on the development of products with high technological content, high value-added and compliant with environmental requirements. Develop production technology of high efficiency, high quality, low consumption and low pollution, and promote application of environmentally friendly leather processing chemicals (including various kinds of auxiliaries, depilatory, delimiting agent, tanning material, new re-

tanning material, and coating materials). Reduce consumption of materials and energy and environmental pollution while improving quality and leather yield.

(b) Promote water saving projects.

(c) Promote clean production process including technology on preservation of fresh hide, hair retaining and depilating technology, cleaning and deliming technology, high chromium absorbing technology, and chromium-free re-tanning technology.

(d) Conduct R&D in environmentally friendly depilatories and chemicals, and reduce pollution by sulfide in the used depilatories.

(e) Apply modern microbial technology to the development of new enzyme specifically used in tanning.

(f) Promote and utilize new water-soluble coating materials, and reduce pollution in the process of leather coating.

(g) Produce recycled leather with bits and pieces of leftover leather, and conduct R&D in high protein animal feed.

(h) Promote the technology of direct recycling of used chromium liquid.

(i) Extend the application of the comprehensive wastewater treatment technology such as biochemistry and ensure that discharged wastewater meet the national standards through primary and secondary treatment.

## **(2) Strengthen environmental management in the leather industry.**

In view of the serious pollution associated with the leather industry, the Chinese government has taken a number of steps to tackle the problem. Pollution control of the Huai River has been the most successful example. Required by the State Council, provinces along the Huai River adopted the aggregate control principle to regulate wastewater discharge. Tanneries that do not meet the national wastewater discharge standards were closed down. Statistics show that 64 tanneries in these provinces were closed in 1997, 90 percent of which were village and township enterprises. In the light of the relatively small size and geographical concentration of tanneries with the majority being township and village enterprises, government departments and regions concerned have set up large wastewater treatment facilities in leather producing centers such as Xinji and Wuji in Hebei, Zhumandian in Henan, and Fuyang and Jieshou in Anhui. This is not only less costly but also easy to manage, and has achieved good treatment results. To intensify pollution prevention and treatment in the leather industry, we must strengthen legislation and enforcement. For this purpose, we make the following recommendations:

(a) Formulate practical and feasible approaches, technical standards and regulations for pollution management, strengthen enforcement, adopt unified standards for urban and rural enterprises, encourage competition on an equal footing, and ensure implementation of treatment efforts.

(b) Encourage tanneries to conduct R&D in clean technology that consumes less energy and material and produces less pollution, encourage enterprises to try to reduce water consumption per ton of leather and to promote recycling of treated wastewater.

(c) For all large, medium-sized and small new projects and projects to be expanded, reconstructed or technically renovated, the environmental assessment system and the system to design, construct and deliver the environmental facilities in parallel must be implemented.

(d) New tanneries should impose strict control over output and annual production capacity. New facilities should be built in the designated industrial zones in order to centralize prevention and treatment efforts, lower related costs and reduce the burden on enterprises.

(e) Capacity of a new tannery should not be below 100,000 sheets of hide (converted to cattle hide).

(f) Strengthen pollution treatment in the existing tanneries.

- Tanneries with capacity above 100,000 sheets of hide (converted to cattle hide) can build their own wastewater treatment facilities to handle wastewater treatment by themselves;
- Tanneries with capacity from 30,000 to 100,000 sheets of hide (converted to cattle hide) can share wastewater treatment facilities. Those enterprises with no access to treatment facilities should be closed.
- Tanneries with capacity below 30,000 sheets of hide (converted to cattle hide) should be ordered to close by the government at or above the county level.

(g) Promote relatively mature environmental treatment technology in the tanning industry.

**(3) Pay attention to the environmental provisions in trade regulations and promote sustainable development of the leather trade.**

The increasing number of environment-related provisions in the international trade regulations is already an indisputable fact, and will have a far-reaching impact on the trade and environment. The direct impact of these environmental articles may be negative on the trade of developing countries. However, it is neither appropriate nor effective to try to reject them. The right approach should be to analyze them, adjust them, adapt to them and create conditions to meet their requirements.

Environment-related articles in the international trade rules fall into two categories. The first category is related to the quality of the product itself (including its effect on the environment in use or at disposal). The second category is related to the environmental impact of the process of producing the product.

With respect to the first category, a participating country, be it an industrial country or a developing country, should first and foremost meet the quality standards for products. Only by doing so, can it ensure that its products get access to the international market. Given that 80 percent of China's leather products is exported to the industrial countries, they must also comply with the quality standards of those countries. It is important to recognize that, with waves of environmental protection sweeping the world, all countries and industrial countries in particular are increasingly aware of the environmental impact and require leather and leather products produced domestically or imported to be safer, cleaner and more environmentally friendly. Under these circumstances, there were already cases wherein China had to stop export of certain leather products to some industrial countries as a result of non-compliance with environmental requirements in the

late 1980s. In December, 1989, the German government decided to ban import of leather goods that used the penlchlorophenol, a poisonous fungicide, in the production process. Soon, the United States, Denmark, Sweden and other European countries all followed suit. Unfortunately, penlchlorophenol was being used commonly in leather processing in China, which led to a halt in the export of leather products to the European and American markets. In response, the Ministry of Light Industry immediately issued a circular to order all the enterprises that produce leather products for export to stop using penlchlorophenol and import the non-poisonous BUSAN30L and BUSAN1193 from the Buckman Co., U.S.A. for the entire process of leather production. To date, China has not been able to develop its own non-poisonous fungicide for leather production, and still has to import such fungicides from the Buckman Co. This, however, has been necessary in order to ensure fast growth of export of leather products and secure market share for China in the industrial countries. Meanwhile, it has helped raised the environmental standards of the Chinese leather products and is good for the environment.

As for the environmental impact of the export products in the production process, the key is to implement the ISO 14000 Environmental Quality Management System. Since this was already discussed before, we will not go into details here.

### **3. Trade policy and measures**

#### **(1) Develop an export structure for sustainable growth of leather export**

Fast growth of foreign trade has both a negative and a positive impact on the environment. The task facing policymakers concerned with trade and environment is to implement the right policies to curb the negative impact and promote the positive impact. Since China launched the reform program and particularly the transition from the planned economy to the market economy and from the extensive growth model to the intensive growth model, the export policy has been shifting its focus away from the extensive and quantitative growth to the intensive and qualitative growth. The change in the export growth model has not only spurred economic growth, but also stimulated the sectoral restructuring and improved the outdated product structure. This is conducive to the promotion of export of energy-saving finished products as well as to the development of the more competitive sectors, and helpful to the improvement of environmental protection in China. In this sense, the evolution process of the leather trade is a typical case in point. Before 1978, 90 percent of China's leather export was in raw hide and leather. By 1997, these two products only represented 3.5 percent of the total leather export. This shows the fundamental change in the product structure of the leather export over the last 20 years, which is dominated by finished products today. More importantly, the structural change of the leather products for export is conducive to the environment in China. As is known, the primary source of pollution in the leather industry is the tanning process, with much less pollution caused by the production of leather products. Consequently, to develop export of the leather products has little negative impact on the environment in China. However, despite the dominance enjoyed by the Chinese leather product in the export markets, the unit price is still much lower in comparison with products of the industrial countries. This is not good for China in terms of saving

resources. For this reason, China should focus its efforts on continuous implementation of the change in the export growth model, and search for ways to raise the unit price of its export products and get higher returns at the cost of less resources.

**(2) Reduce import of raw hide and vigorously develop domestic production of high quality hide**

As a consequence of the shortage of domestic supply of quality hide, China continues to import large quantities of raw hide from the United States. From an environmental perspective, imported raw hide causes serious environmental pollution. Strong measures must be taken to reverse this situation.

Following are our suggestions:

Given the shortage of domestic supply of quality hide, import of raw hide from the United States is not likely to decrease in the short term. We suggest that the government department concerned should designate those large tanneries with good pollution control record to process raw hide and supply their users, so as to minimize pollution. In the longer term, China must develop its own quality hide production to reduce dependence on imports. Now is good time to develop China's quality hide production. With the government's new initiative to develop the western region and implementation of the environmental protection strategy, greater efforts will be made to reconvert farm fields to forests, grasslands and develop animal husbandry. Ningxia, Inner Mongolia and other provinces with relatively developed cattle and sheep raising are likely to restore production of high quality hide. We suggest that the government department concerned should develop plans to establish national-level cattle and sheep raising bases. In this way, China can solve its short supply of quality hide, and reduce and ultimately stop raw hide import to prevent environmental pollution.

## Chapter Four

### Trade and Environmental related Issues in Textile Dyes Industry

#### 4.1 The Status Quo of China's Dyestuffs Industry

Dyestuffs industry has had a prolonged history in China. It has seen swift growth in recent years, both in quantity and in variety, though not proportionately. In the eighth Five-Year-Plan period, it averaged a 5% annual rise. In 1996 the amount produced from 1,100 enterprises totaled over 223 thousand tons. In 1997 the total output of dyes reached more than 256 thousand tons. Table 4-1 shows the ten key dyestuff enterprises and the quantity of their products in 1997, most of them have been located in provinces like Jiangsu, Zejiang, Hebei and Liaoning and municipalities such as Shanghai and Tianjin. Of the aggregate amount 66% were from the eastern part of China, 18% from the northern, 11% from the northeastern and 5% from other parts, for details see Table 4-2.

**Table 4-1 Ten key dyestuff enterprises and their output quantities in 1997**

Enterprises	Output(tons)	Enterprises	Output(tons)
<i>Tianjin Dyestuff and Chemical Industry Company</i>	25,309	Suzhou Dyestuff Manufacturer	4,354
<i>Dalian Dyestuff Manufacturer</i>	16,649	Beijing Dyestuff Manufacturer	3,603
<i>Shanghai Dyestuff Company</i>	10,959	Sichuan Dyestuff Manufacturer	2,749
<i>Qingdao Dyestuff Manufacturer</i>	9,324	Wuxi Dyestuff Manufacturer	2,117
<i>Jilin Chemical Industry Company Dyestuff Works</i>	6,567	Anyang Dyestuff Manufacturer	2,079

Source: China Chemical Industry Yearbook, 1998/1999

**Table 4-2 The dyestuffs output quantities in different parts of China in 1997**

Regions	Output (tons)	Percentage of Total(%)
<i>East China</i>	169,970	66.32
<i>North China</i>	46,093	17.99
<i>Northeast China</i>	28,480	11.11
<i>Mid China</i>	4,943	1.93
<i>Southwest China</i>	6,780	2.65
<b>Total</b>	256,267	100

Source: China Chemical Industry Yearbook, 1998/1999.

Some of the latest skills and equipment functionally satisfactory have been step by step introduced in the dyestuffs industry, thus, upgrading it to a due level. Its products have been mainly consumed by the textile industry whose staple raw materials are natural

fibers, resulting in the preponderance and rising tendency of cotton dyestuffs, such as sulphur, vat, direct and reactive dyestuffs, the last named in particular. Since Terylene products have topped other chemical fibers, hence the absolute output figure of dispersed dyestuffs for them is very high, next only to the sulphur dyestuffs.

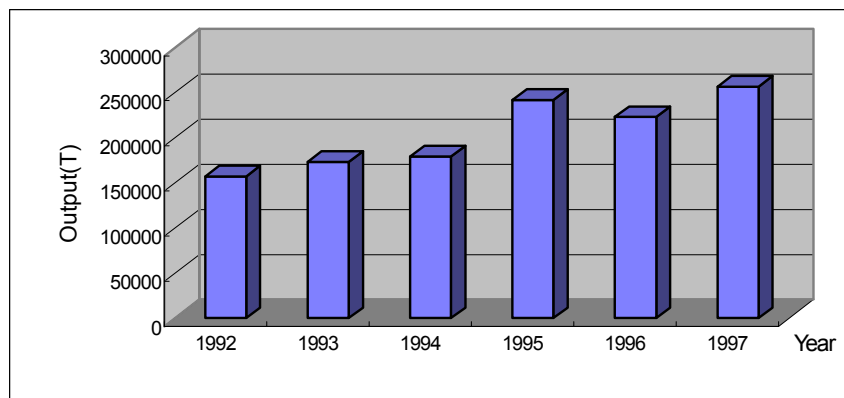
Statistics from the Ministry of Chemical Industry and National Customs Administration shows that China's production of dyes are growing annually (see Figure 4-1) from 157,000 tons in 1992 to 257,100 tons in 1997. The table 4-3 shows the output of different kinds of dyestuffs in China in 1996. The dye output in 1996 was about 223,000 tons, a bit lower than in 1995. In 1997 the dye output was higher than 1995 and 1996. The production of sulphur dyes, disperse dyes, reduced dyes and acid dyes had a better developing trend. The production and sales of dyes in China are going towards a positive direction, but there exist a number of problems in the product structure and the coordination between supply and demand. The varieties, level, quality of the domestic dyes cannot meet the requirements and the development and production of dyes domestically are far from meeting the needs of domestic users.

**Table 4-3 The output of different varieties of dyestuffs in 1996 and 1997**

Categories of Dyestuffs	Sulphur	Direct	Basic	Reduced	Reactive	Disperse	Others
<b>Output (tons) in 1996</b>	66,527	9,005	3,660	14,831	6,306	53,058	69,685
<b>Output (tons) in 1997</b>	61,835	10,527	5,063	20,977	17,245	69,977	70,643

*Source: China Chemical Industry Yearbook, 1997-1998*

**Figure 4-1 The output of 11 kinds of dyestuffs in China**



*Source: China Chemical Industry Yearbook, 1992-1998*

## 4.2 The Import and Export Trade of China's Textile Dyestuffs



As is said, dyestuffs are mainly used in textile industry, so the two are closely related. Textile has been China's traditional pillar industry and chief export industry; it has contributed a great deal to China's economic development. Since the reform and open policy, China's textile industry has been growing at an average annual growth rate of 13.7%. In the 17 years between 1978 to 1995, the textile industry has turned in a total tax revenue of 380 billion yuan, a total foreign exchange revenue of 233.45 billion USD or a net foreign exchange revenue of 11.05 billion USD (1996 statistics). In 1995, textile industry has a total output value of 703.5 billion yuan, or 14.55% of total industrial output value in China, and 5.27% of total industrial tax revenue.

From 1978 to 1994, textile has remained China's largest foreign exchange earner, making up about 1/3 of China's total export. During this period, China's textile and clothing export has grown rapidly. Textile export value has jumped from 2.43 billion USD in 1978 to 37.97 billion USD in 1995 with an annual growth rate of 17.6%. The 8<sup>th</sup> five-year-plan was a golden period for China's textile export. In 1992, China's textile export broke through 20 billion USD to reach 20.147 billion USD; by 1994, the figure was 35.55 billion USD; and in 1995, export of Chinese textile products and clothing reached 37.97 billion USD, bringing in 25.5% of China's foreign exchange income. China's portion in world textile trade was also raised from 3% in 1978 to 13% in 1995, and its ranking from 11<sup>th</sup> to No.1. In 1997, China's textile export totaled 43.21 billion USD. China has indeed become a leading textile and clothing producer and trader, and takes a prominent position in world textile trade.

Negative growth occurred in the export of textiles from China in 1998 due to financial crisis in Southeast Asia, with a 6% reduction compared with that in 1997. Another reduction in the textile export occurred from January to May, 1999 compared with the situation during the same period of the previous year. Consequently, the textile industry in China and many textile enterprises suffered huge losses. To cope with this situation, China, on one hand, adopted a series of macro-adjustment policies in the second half of 1999. One example of this is the policy for increasing tax returns for textile exports, with the percentage rising from 11% to 17%, which has substantially edged up the competitiveness of textile exports from China. On the other hand, China made greater efforts to restructure the textile enterprises. From August, 1999, China's textile export volume recovered from the recession. The growth by 31% occurred in the clothing export which has been on the decline. The recovery of the textile industry in China has brought a

new opportunity of development for the dye sector in China.

The dyeing and finishing of textile products have enjoyed a long history in China, but their progress for a time had been very slow. In the seventies and eighties, the dyeing and printing of different blend, medium-length and synthetic silk fabrics led by Terylene were developed. With the advent of the nineties, the demand and growth of clothing and decorative industries furthered its vigor. In 1995, it was reported that in operation there were 2,253 cotton cloth dyeing and printing enterprises at the township levels or above, with an annual output capacity of 210 billion meters, actual output 136 billion meters, 70% of the total produced by those in the economically well developed coastal areas, i.e. the provinces Zhejiang, Jiangsu, Guangdong and Shandong and the municipality Shanghai. As a whole, this branch of industry is still relatively backward in China, resulted from the insufficiencies regarding operational skills and technology and the native dyestuffs and auxiliaries in point of quality and variety. However, thanks to the boost of textile dyeing and printing, a pretty rapid development has registered in recent years. Native dyestuffs, in the main enough to meet its need, has had 50% exported abroad to some 100 counties and regions. It is safe to say that China is now a producer of dyestuffs in the world.

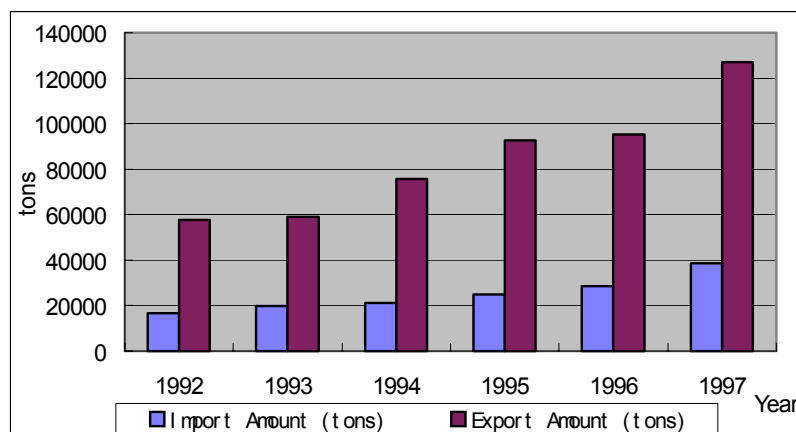
According the customs statistical figures, since the nineties, China's export amount of the product has shown an annually increasing tendency. For instance, the amount increased from 58 thousand tons in 1992 to 126.9 thousand tons in 1997, of which the disperse dyestuffs from 4,893 tons in 1991 to 52,224 tons in 1997. Such favorable accretion has led to an import upturn of the product as well, from 19.9 thousand tons in 1993 to 38.7 thousand tons in 1997(see figure 4-2), the sum of reactive and direct dyestuffs for two years running 1995 and 1996 topping that of exports.

Table 4-4 The import of dyestuffs in 1996 and the sum of foreign currencies spent

Categories of dyestuffs	Import Amount (tons)			Sum of Foreign currency (10 Million US\$)		
	1996	1995	Change Rate %	1996	1995	Change Rate %
<i>Disperse</i>	5373.21	4020.92	33.63	2933.13	2015.18	45.55
<i>Acid</i>	3034.65	2404.35	26.21	2369.30	1789.34	32.41
<i>Basic</i>	1199.66	614.03	95.37	455.33	320.54	42.05
<i>Direct</i>	5857.52	5687.04	3.00	1680.17	1856.94	-9.52
<i>Reduced</i>	932.17	914.63	1.92	470.10	452.39	3.91
<i>Reactive</i>	8215.44	6665.82	23.25	4323.76	4299.48	0.56
<i>Sulpher</i>	1788.61	1252.63	42.79	312.06	298.72	4.47
<i>Others</i>	2304.92	2529.15	-8.87	803.56	830.15	-3.20
<i>Total</i>	28706.18	24088.84	19.17	13347.41	11862.74	12.52

Source: China Chemical Industry Yearbook, 1996-1997

Figure 4-2 The import and export trade of dyestuffs in China



Source: China Chemical Industry Yearbook, 1992-1998

The export of dyes from China in 1997 was 126,949 tons, with a foreign currency revenue of 52,897 USD, an increase by 33.08% and 31.91% respectively compared with those in 1996.

Domestic related material shows China's annual dyestuffs output totals 25 thousand tons. Domestic textile dyeing demands 90 thousand tons, of which 2 thousand tons supplied by imports. All the above exhibits that the internal production and consumption of dyestuffs point to a hopeful direction. But it can also be seen that big problems are still in existence in the structure of variety and the co-ordination of supply and demand. Domestic dyestuffs fall short of the requirement to a large measure in the spheres of variety, level and quality and those good for environmental protection are developed and produced far from enough to satisfy the consumers in the country.

### 4.3 Problems Concerning Environment and Trade of China's Textile Dyestuffs

#### 1. Environmental Problems in the Production and Use of Dyestuffs

- *Environmental Problems in the Use of Dyestuffs*

As a main chemical substance in textile dyeing and printing, dyestuffs seriously affect environment. Toxicological elements contained are aromatic ammonia, cadmium, mercury, chromium and other heavy metal salts, all cancer causing, when released, will pollute the water to be colored and with offensive smell and their continuous widespread

dispersing, if not handled in time, will worsen ecological environment. To control and solve the problems arising from dyestuff pollution an international organization ETAD (An Association of Ecological and Toxicological Association of the Dyestuffs Manufactory Industry) has come into being. A permissible maximum quantity of metal elements in dyestuffs has been specified (Table 4-5). A lot of researches and tests concerning dyestuffs allergic reactions have been conducted at home and abroad. But so far no permissible maximum quantity of harmful metal elements in dyestuffs has been set in China.

**Table 4-5 Maximum Acceptable Concentration of Metal in Dyestuffs**

Metal	Level□ppm□	Metal	Level□ppm□	Metal	Level□ppm□
As	50	Cu	250	Pb	250
Ba	100	Fe	2500	Sb	50
Cd	50	Mg	25	Se	50
Co	500	Mn	1000	Sn	250
Cr	500	Ni	250	Zn	5000

Source□R.Anlinker,J.S.D.C. 95(9),317,1979

In recent years, the issues of azo-dyes containing various carcinogenic substances have attracted the concerns of many countries. For this, the government of Germany issued on July 28, 1994 the second Amendment to its Consumers' Product Act which banned the use and sales of textiles containing such dyes. In addition, a list of 118 banned azo-dyes was promulgated.

Among 118 banned azo-dyes, there are 77 direct dyes, 26 acid dyes and 6 disperse dyes, which account for 92.4% of the total banned dyes. 104 dyes being currently used in China have been banned in Germany. More than 100 enterprises in China are producing such dyes as banned in Germany, with a substantial figure of output. The banned dyes are mostly direct and acid ones. Owing to the simple process adopted for direct dye production and low price of such dyes, China is producing and consuming a large amount of such dyes. The output of direct dyes in 1996 exceeded 9000 tons, ranking second in the production of all kinds of dyes. The acid dyes are mainly used for dyeing wool, silk, nylon and leather products. As the living standard is rising in China, the consumption of wool, silk and leather products is constantly increasing and as a result, the use of acid dyes takes an upward trend by years. The German ban on azo-dyes has significant impacts on the production and use of dyes and the restructuring of dye industry in China.

- *Environmental Problems in the Process of Dyestuffs Production*

It is estimated that the annual dyestuffs output in the world amount to over 900 thousand tons, of which some 400 thousand tons for textiles. Dyestuff lost in the process of manufacturing 2%, and in the process of dyeing and printing 10-20%, totaling about 80 thousand tons, half of it becomes harmful elements to human environment. The rate of dyestuff lost in the process of printing was listed as follows (table 4-6). There is a big gap between our country's dyestuffs industry and the developed countries' in manufacturing skills and equipment and our elemental protection control measures in this trade is still relatively weak and the related problems caused are pretty serious.

**Table 4-6 The rate of dyestuffs lost in the process of dyeing and printing**

Type of Dyestuffs	Lost rate %	Type of Dyestuffs	Lost rate %
Direct	5-20	Acid	7-20
Basic	2-3	Reactive	20-50
Sulphur	30-40	Reduced	5-20
Disperse	1-20	Metal complex	2-5

The wastewater released in textile industry is more than 80% from printing and dyeing. Due to its huge amount and high density, the wasted water thus released has long been a tough problem defying easy solution. The ways of its treatment have been different in view of varied products in different periods. After mid-eighties, the raw material used in textile industry underwent a phenomenal change, a large part have been replaced by chemical fibers, so at present the main measure is the anaerobic-aerobic biological treatment, 70-80% of COD can be reduced.

In recent years, the sustained strengthening and implementation of environmental protection measures have greatly diminished the seriousness of pollution in the trade. In the related enterprises, 90% of the problems have been tackled and 70% have reached the targets set. In similar township enterprises nearly 50% of such waste water has also been treated, but the systems in operation are not satisfactory, those truly reaching the targets are few and far between.

From 1993, the State Environmental Protection Administration has promoted clean production as well as its auditing in the related enterprises. It is estimated that some 60 enterprises of the trade in the country have thus audited. Such easy and effective program has reduced the release of 10-20% of waste water and 10-15% of COD in the trade administratively controlled large and medium sized enterprises. In the township related

enterprises not trade administratively controlled, the reduction rates are respectively 30-50% and 20-35%. In both categories, pronounced effects in economic benefits and environmental protection have scored.

In line with the State Council Decision on Some Issues of Environmental Protection about 15 categories of heavily polluting small township and village enterprises which also include small dyeing and printing enterprises, up to September 1997, 6,5244 such enterprises were closed down, 87.25% of those within the categories. Of the figure, 1167 were small dyeing and printing enterprises.

## ***2. Foreign Standards/Requirements on Textile Dyes***

In the 1990s, many countries and organizations have made environmental standard and requirement concerning the use and quantity restriction on harmful chemicals in producing textiles and clothing. Some of these standards and requirements are compulsory state laws and regulations, the most typical of which is the *Second Act Amending the German Commodity Goods Act* issued by the German government in 1994 prohibiting the use of azo dyes. Some others are ecological label standards, the goal of which is to reduce pollution on voluntary basis. At present there are many types of ecological labels - the most well-known ones include Milieukeur and Eko of the Netherlands, and Oeko-Tex 100 and Toxproff of Germany.

### ***1) The amendment on German Commodity Goods Act concerning azo dyes***

On 28 July 1994, the German government issued the *Second Act Amending the German Commodity Goods Act* prohibiting the use of azo dyes which may form any of the 20 cancer-causing aromatic amine through azo group decomposition in products which have contact with human skin, such as clothes (even including coat) and bathing towels (page 1670 - 1671 in the *Act*), and that from 1 July 1995, sales of textiles using such harmful dyes in the dyeing or printing process shall be prohibited in Germany.

On 23 December 1994, the Federal Congress of Germany passed the Third Amendment Act, extending the deadline for the sale and import of azo-related products to 1 April 1996.

On 27 July 1995, the Fourth Amendment of the Act was issued, extending the blacklist to

include two more aromatic amine that are suspected by the Health Committee of EU to have cancer-causing effect, thus increasing the number of prohibited aromatic amine to 22. This Amendment also prohibited the import of textiles containing the blacklisted dyes from 1 April 1996. The problem with the Fourth Amendment is that it did not include provisions on standard testing method and maximum amount for analysis and testing.

On 23 July 1996 the Fifth Amendment was issued which made clear stipulations on many issues, such as: the maximum amount of aromatic amine as a result of testing should not exceed 30 ppm; use of azo dyes specified in *Second Act Amending the German Commodity Goods Act* was prohibited in Germany; import of products using such dyes in the dyeing and printing process was also prohibited;

From 1 October 1996, sale or use of products dyed or printed using the blacklisted dyes were prohibited;

From 31 March 1998, production and import of azo pigments or import and sale of products colored with such azo pigments were restricted;

From 31 September 1998, sale of products colored with azo pigments were restricted;

From 31 December 1999, work clothes, protective clothes containing blacklisted dyes shall be prohibited from circulation;

From 31 December 1999, products using recycled fiber which contain blacklisted dyes shall be prohibited from circulation.

**The German law also stipulated that violation of this Act shall be considered criminal offence and will be severely penalized. Should a product be found to contain the blacklisted dyes in sample test, the product concerned will be burnt and the importer or producer shall be punished.**

## ***2) Azo-related legislation in other countries***

**Since the issue of German Act and its coming into effect on 1 April 1996, it has aroused great attention in many countries, especially some European countries and third-world countries.**

- **Netherlands**

Legislation on prohibiting the use of certain azo dyes came into effect in August 1996, with the same blacklist of 20 cancer-causing aromatic amines as that of Germany. From 1 August 1996, the Netherland Act prohibited import of clothes, shoes and bed sheets containing black-listed azo-related dyes. Sale of textiles containing black-listed azo-related dyes before 1 September 1997 were not affected by the Act. From 31 December 1999, circulation of protective clothes such gloves colored with blacklisted dyes and consumer products made with regenerated fiber or second-hand clothes shall be prohibited. However, the latest research shows that azo dyes do not release cancer-causing amine under normal conditions. Therefore the final version of legislation concerning dyes did not prohibit use of these azo dyes.

- **Sweden**

Although the draft of Swedish legislation on azo dyes has not been made public, there is information that the content and standard will be similar to that of Germany.

- **France**

Following Germany and Netherlands, France is also working out legislation concerning azo dyes in clothes fiber.

- **Denmark**

Laws prohibiting use of azo dyes will be issued soon. It is said that the standard will be similar to that of Germany .

- **EU**

Information at the beginning of 1997 indicated that EU's laws prohibiting use of azo dyes shall come into full effect from October 1997. However, according to the latest information, EU is very cautious over the promulgation of such laws. At present, EU is assessing the risk of some azo dyes in textiles; the result of the assessment will determine whether the laws will be promulgated.

### ***3. Adjustment of the Structure of Products and New Requirements on Dyestuffs in Chinese textile and printing industry***

Confined by the modes of traditional manufacture and management, the structural contradictions are quite glaring in China's textile products. Most of them are of the medium or low levels and lack of variety in specification and raw material and the colors are not bright enough. With the price hikes of raw material and other unfavorable



elements, China's textile dyeing and printing enterprises have suffered losses for years on end. Related statistical figures show that the loss in 1996 amounted 1.71 billions Yuan. The fundamental way out of the impasse is the introduction of a change in mechanism of operation and an adjustment of structure of products to meet the market demands. A host of high additional value products should be developed. Efforts must be made to produce fabrics of high quality, high count yarn and broad width, and new varieties of prints and dyestuffs turned out with new skills and garment of deep processing.

Such change and adjustment no doubt will place new demands on textile dyestuffs. Apart from high quality in general, much attention should be paid to environmental protection as is required by consumers abroad. The production and development of substitutes for native dyestuffs to meet environmental protection have become an important factor for the growth of the industry and in particular acceleration of the export of its products. The new demands include the development of dyestuffs and auxiliaries fit for new chemical synthetic fibers and pure cotton fabrics. Viewed world wide, the development of new type dyestuffs is an important tendency of this branch of industry. In 1997, commodities of new type dyestuffs numbered 318 are available on the market, a 57.4 increase over the same period of the previous year, the highest in the last five years. The new type dyestuffs are marked by their high quality and meeting high ecological and environmental protection requirements. The new tendency covers the development of products to replace the substitutes forbidden by German government and dyestuffs without heavy metals. In the adjustment of the industry in China this worldwide tendency and pace must be closely followed before expected progress can be made.

Pure cotton fabrics are China's traditional products with a wide market and a consumption of large quantity. But the prevailing international tendency in recent years has been the preference of coarse and thick fabrics of high quality and density. Such products have better additional technological value. This kind of fabrics need high quality dyestuffs, but the usual dyestuffs used traditionally in China are powdered sulphur ones, without purification before hand, ill-adapted to the regulations of environmental protection. As a result, such liquid sulphur dyestuffs are by and large imported, such as Clariant's sodyeal and Dystar's Caeeulqfon. Cotton fabrics being China's traditional exports, the development of the dyestuffs mentioned above is highly significant to the country's reduction of production and expansion of export in cotton dyeing and printing industry.

The direct dyes have colors of yellow, orange, red, purple, blue, gray and black. They are

a complete set of colors on color spectrum. They can be used for dyeing of needle knits, silk, cotton, threads, towels and quilts and some textile products. They are widely used due to their convenient application, simple synthesis and low price. 25% of the dyes used in the needle knitting sector of China are direct dyes and 15% for silk sector. So the consumption of direct dyes is very big, second to sulfur dyes, and the sales of such dyes are also big in China.

However, 77 out of 118 Germany-banned dyes are direct ones and the import of these direct dyes in China in 1995 and 1996 exceeded the export for two years. 37 categories of direct dyes currently produced and used in China have been banned by some countries, accounting for 62.7% of the total direct dyes made in China. The annual amount of such dyes banned is 2500 tons, accounting for 30% of the total output.

#### **4.4 Analysis of the strains and impetus from trade and sustainable development of dye industry in China**

##### ***1. Pressure for textile dye development***

- ***International environmental requirements force China to increase dye products import***

The import of dyes in 1989 was about 13,000 tons with foreign currency expenditure being 55 million USD. The import of dyes was increased to nearly 30,000 tons in 1996 with foreign currency cost being 134 million USD. The increased import was caused by many reasons. Besides the unsuitability of the relevant industrial policy and the market operation approach with the development of modern industry which lead to the unsuitability of the structure of products and the production and sales with the market needs, another reason is that the intermediate and low level of products cannot meet the needs of different users. The environmental requirements as coming out of the German ban led to the increase in domestic needs for environmentally friendly dyes. This is also one of important reasons why the import was increased in recent years.

After Germany announced the ban in 1994 and the list of banned dyes checked, it was found that 104 varieties of dyes being used have been included in the ban. The output of the banned dyes was big, such as RGFL yellow disperse dye, whose annual output was more than 6000 tons across the country.

Under the circumstances that Germany has not yet publicized the method of testing and the producer is not sure of whether the domestically-produced dye substitutes have the substances banned for use, the relevant departments require that all the products exported to Europe use imported dyes in order to avoid losses. It is found through our survey in the textile and dyeing enterprises in Jiangsu and Zhejiang Provinces that during 1995-1996, the amount of use of imported dyestuff increased from 10% to 40%-50%. According to a statistics, the foreign currency used to import dyes in 1996 amounted to 134 million USD, about 1.5 million USD increase over that in 1994, with a growth rate being 12.5%.

- ***Part of import of dye products pounded domestic production***

Reactive dyestuff is a major printing material for cotton, wool, silk, linen and polyamide, especially for cotton and other blend fabric. Reactive dye makes up approximately 5.2% of the total output of dye. The percentage is relative small.

Recent years, along with the growth of environment protection requirement worldwide, people pursue the conscience of "back to the nature" and cotton products are getting popular. So the research and development of new printing material or new pigment are speeded up all over the world. Since beginning of this decade, we have noticed that the most of new pigment products, which developed by advanced countries, were reactive pigments and disperse dye. And among these new products, reactive dye had been developed faster than other products; it accounted for more than 30% of all new products. The impact of human health and ecological environment has been a primary concern during development of new pigment products internationally.

Import dye products contained predominated technology advantages, and also the quality and environment requirement had met the higher standard. Although the price of these new products were 3-5 times higher than domestic products, most textile printing enterprises still chose using import pigments. That is why the import of pigments has been increased. Remarkably, the import of reactive dye had surplus over export in 1995 and 1996 back to back for two years. The import surplus made already intense market competition, which caused by supply over demand in domestic market, even worse. A lot of dye manufactures cut the price in order to catch the market share. For example, in 1998, the price of reactive pigments had been dropped 20-40% from 1997. This type of pernicious competition could also be found in export trading: compare 1998 to 1997, the

price of several major export dye products had been overeagerly reduced more than 20%. Because the vicious rivalry, some dye manufactures bankrupted.

**Currently, Chinese reactive dyestuff industry has been experiencing a depressed period. Many European and American companies shifted their dye production to China and South-East Asian countries, because the cheap labor in these regions and the advantage of capital and technology over these developing countries. It is very easy for these European and American companies to produce dye products in Asia and to catch the huge market as well. Here we can name several famous pigment manufacture companies such as German BASF, Swiss Ciba-Geigy and German Bayer. They all established their own manufacture and business in China. Domestic manufactures have no way to compete with them.**

- *Insufficient structure and system has impeded the development of textile dye in China*

Balance of supply and demand is a conspicuous problem in dye industry in China. Recent years, overall output of pigment products has been increasing, but because the import has been increasing too, the overstocking of domestic dye products is severe. Based on the relevant document, in 1994, the national level stock of dye products reached 27,700 tons, plus overstocking by textile manufactures and export/import department, the total stock was almost 50,000 tons. On distribution side, certain government department made a statistics on 38 national key enterprises, 20 companies 1995's sales were lower than 1994. The highest decrease range was 70% drop. The highest loss incurred in a single enterprise was 450,000 yuan RMB. The whole industry's return, now, is not optimistic. The most enterprises can barely make benefit, and others have serious loss.

**Table 4-7 Benefits in Dyeing sectors of China from 1990 to 1997**

Year	State-owned enterprises(billion yuan RMB)	Non-state-owned enterprises (billion yuan RMB)	Total profits(billion yuan RMB)
1990	4.54	7.03	11.57
1993	-2.0	5.71	3.71
1994	-3.5	5.05	1.55
1995	-5.37	7.39	2.019
1996	-10.59	8.87	-1.71
1997(Jan.-Sep.)	-0.37		

**There are several reasons to cause the straitened circumstances for textile dye development in China. Among them, the most important reason is the structure and system of the industry is irrational, which is caused by the imbalance of supply and demand. Overstocking low quality products, redundant of inferior equipment and facilities brought into the price war. All these directly influenced the development of reactive dyes, dispersed dyes and sulphur dyes. On the other side, some highly demanded products have not been produced efficiently in China without causing environment problem. So, we have to import them regardless we have so many idle manufactures. It is necessary and important to adjust the textile dye industry structure and system to meet the need of development.**

- ***Foreign environmental requirements affected China's textile exports***

Despite the original intent of the German ban is positive and legitimate, as it aims to protect human health, it has nevertheless brought about some obstacles in international trade, especially to exports from developing countries including China. Before the legislation were adopted or during its implementation, Germany did not fully consider providing necessary and relevant information and technical assistance to China or other developing countries. Meanwhile, special treatment to developing countries was not considered neither.

According to the investigation to China's major textile exporting companies in China, during 1995-1996, the German ban caused great pressures to many textile, dye and dyeing enterprises and trading companies in China, as their products and exports were impeded because of this ban. Due to many uncertainties of the ban itself and lack of understanding and knowledge of this ban, some producers and exporters in China had to stop exporting the textile products containing azo dyes. The competitiveness of some products was weakened due to the increased costs as a result of this ban.

## **2. Impetus for textile dye development based on international Environment requirement**

- ***Promote the research and development of the green dyestuffs in China***

77 out of 118 dyes banned by Germany are direct dyes, accounting for 65.2%, and altogether 72 dyes contain benzidine and its byproducts. Benzidine used to be an important medium used in the dyeing sector and the output of direct dyes using it as raw material is a half or so of the total output. Its color spectra are also very rich, containing red, black, green, gray, brown and other colors. Because the toxicity of the banned dyes comes mainly from 22 categories of aromatic amine used as medium, so the study on substitute dyes is focused on these amines and the dyes using them as raw material. The first thing to do is to substitute the benzidine medium for non-benzidine one. The substitutes for banned direct dyes, acid dyes and disperse dyes should also be developed.

Considering German ban and wide promotion of the standards in the Eoko-Tex Standard 100 and the dilemma the textile and dyeing sectors face, the authorities for textile and dyeing sectors in China worked together the department of commodity inspection in 1994 and 1995 for solution and study the issues of substitutes for the banned dyes. Their starting point is that they consider the ban as an opportunity to increase the environmental awareness of the textile and dyeing sectors in China and upgrade the quality and categories of dyes to expand the market share of dyes so as to promote the development of the dyes in China.

Shanghai, where many textile and dyeing enterprises are located, reacted actively to this ban. Coordinated by Shanghai Municipal Economic Commission, Shanghai Dyes Company, textile production companies and trading companies in Shanghai worked together to research and develop substitutes. Up to now, Shanghai Dye Chemical Company No.5 has established a production line for a new type of yellow disperse dyes with a monthly output of 10 tons and completed the preparation for commercialized production of blue disperse dyes even though many difficulties were encountered. Shanghai Dye Chemical Plant has successfully developed four categories of new disperse dyes to substitute the yellow and red banned dyes, with some of new dyes exported. Shanghai Dye Chemical Plant No.9 has developed and produced D-type new direct dye to substitute the benzidine direct dyes, which enjoy increasing sales after having been placed on the market. In addition, this plant has also developed the S-type new weak acid dyes used for polyamide fiber and wool dyeing and the new medium to replace benzidine, which will be commercialized soon. Shanghai Dye Chemical Plant No.8 has successfully developed two sets of active dyes used for linen products as substitute of banned dyes and added five new categories of ME-type active dyes.

Since 1995, some big foreign companies engaged in dye production have been investing in China, for example, Shanghai BASF Chemical Company, a joint venture established by BASF of Germany and Shanghai Dye Company, Qingdao Ciba Textile Dyes Company Ltd., a joint venture established by Ciba-Geigy of Switzerland and Qingdao Dye Plant and Wuxi Bayer Dye Company Ltd. a joint venture established by Bayer of Germany and Wuxi Dye Company. These companies add new life to the dyeing sector in China by bringing advanced production technologies and processes and promoting the research and development of dye substitutes in China.

The research on substitutes for banned dyes is a complicated job. The substitutes must be better than the original dyes in terms of dye function, fixing function, environmental requirements and price. Much progress has been merited in this field in other countries while China has made the first step. In recent years, the increasing demand of domestic and international markets for environmentally friendly dyes accelerates the research, development and production of substitute dyes in China. At present, the production capacity of a certain scale of some substitutes has taken shape, which add new life and bring new opportunities to many textile trading companies.

- *Accelerating adjustment of products structure in dyestuffs industry*

The pigment industry had fairly progress in recent years, but comparing other countries, and based on the demand of the market, Chinese dye industry is still far behind. Such as imbalance of output, low quality products and low technology value products had been overproduced and still doing so. And market demanded high quality products, which accorded with the requirement of environment, felt short. Many domestic textile printing enterprise had to import the products to keep their quality and meet the export request, even though, these import products were very pricey.

According to a statistics, China is using 104 out of 118 Germany-banned dyes and 37 out of 77 direct dyes banned. According to an incomplete statistics, China has nearly one hundred companies producing banned dyes. In addition, as early as the 1970's the department of chemical industry has formulated a regulation which clearly provided that the production of some carcinogenic media such as benzidine and of azo dyes using them as raw materials be banned. However, due to the loose enforcement, this ban was not implemented. In the past decade and over, a few dye-producing enterprises, in particular those small village and township enterprises, continue to produce and sell these banned

dyes in order to pursue high profits. These products still enjoy a certain market share due to their low price.

**After German ban is announced, China has begun to inspect the enforcement of this ban in the dyeing sector, which focused on the use of raw material, production process and the management. Many companies have established the rule that their products will not contain or be derived of carcinogenic aromatic amine. Since the environmental standards and requirements are being upgraded in other countries, many export-oriented companies and enterprises have to pay more attention to the source and quality of dyes they use to ensure that their products will not contain the banned substances. The result will be undoubtedly that the market of banned dyes will be gradually shrunk. Therefore, many dye producers have to readjust their product structure by stopping the production and sales of those banned dyes and turning attention to the development of new dyes and improvement of the dye quality and try to increase market share through better dye quality and categories.**

- *Promotion of foreign investment attracted for dyeing sector*

According to the statistics, by the end of August 1995, total 238 international enterprises had invested in Chinese Dye industry. Among them, 220 enterprises were joint ventures, 4 were corporations, 14 wholly owned subsidiaries. The total foreign investment in contract was \$3,996 millions, actually allocated \$2,333 millions. Most foreign investment were distributed mainly over costal area, where industry and commerce are flourishing and pigment industry foundation is more solid, such as JiangSu province, TianJing and ShangHai.

Since 1995, some big chemical companies from Germany, Switzerland and some other European countries have come to China to establish big joint ventures to produce dyes. BASF has established a big factory in Shanghai to produce pigment and agents, with annual production of 5900 tons of pigment, 3100 tons of positive-ion dyes and 26000 tons of agents. In addition, a company merged by two biggest German dye producing companies, Bayer and Herst, has established a joint venture in Wuxi. The other joint ventures in this sector can be seen in Table 4-8.

These foreign companies or joint ventures use mature technologies and adequate capital to produce traditional dyes as well as popular ecologically friendly dyes in a large scale. They claim that these dyes do not contain carcinogenic aromatic amine banned by Germany and other ecological labels. They play an active role in upgrading the level of production and management of the dye sector, improving the



dye quality and developing the environmentally friendly substitutes.

Table 4-8 Foreign Investment in Dyeing Sector of China

Joint ventures and mother corp.	Time of establishment	Investment (10000 USD)	Range of business
<i>BASF Shanghai-BASF Germany</i>	1993		Production of pigment and textile dyes by 3 phases and operation in 1995
<i>Dyster Wuxi-Dyster Germany</i>	1995	1800	annual production of 3000 tons of disperse and acid high-level dyes and operation in first half of 1997
<i>Dyster Shanghai</i>	1995	2180	raw material for oxygenated iron
<i>Qingdao Ciba-Ciba Switzerland</i>	1997	2500	annual production of 3000 tons of textile dyes
<i>Clariant Tianjin-Clariant Switzerland</i>			annual production of 4000 tons of disperse, direct and acid dyes
<i>Hoechst Guangzhou-Hoechst Germany</i>	1995	300	mother color crystals for dyes of synthetic fiber

Source: China Chemical Industry Yearbook, 1994-1997, China Chemical Industry Press

#### 4.5 Lessons and Conclusions

The constantly upgrading environmental standards for dyes in other developed countries and the increasing domestic and international demands for environmentally friendly dyes have also brought new opportunities as well as serious challenges for the production and market expansion of dyes from China.

There are currently many problems with the dye sector of China. Among others, the most important issue is the low technological level and irrational product structure which leads

to conflicts between supply and demand. Indicative of this situation is on one hand the serious overstocking of low-grade dyes and the excessive capacity of low-level production, and on the other hand, poor capacity of technical development and low environmental awareness of enterprise managers. This leads to few varieties, low production capacity and inadequate supply of technology-intensive high-grade and environmentally friendly dyes.

From the analysis of the pressure and motivation faced by the dye sector in China, we can conclude that as environmental standards for textile products in other countries are upgraded, the demand for environmentally friendly dyes for the textile industry will be increasing substantially while the demands for the banned dyes will be constantly reduced which results in the overstocking of low-grade dyes. This will in practice facilitate strongly the restructuring of dye sector. Meanwhile the environmental standard upgrading in other countries has promoted the research and development of substitute dyes for banned dyes. In recent years, China has succeeded in developing a group of environmentally friendly dyes to replace the banned dyes. This has not only saved the foreign currency spending but also strengthened the capacity of technical development in China.

The foreign investment attracted to the dye sector is crucial for the sectoral development. As the reform and opening to outside world deepens, a number of big dye companies from other countries have come to China to invest since 1995. With advanced technologies and strong investment, they bring new life to the dye sector in China and promote the research, development and production of high-grade and environmentally friendly dyes. According to incomplete statistics, 384 new dyes have been developed and placed on the world market in 1998. The development of new dyes was focused on how to meet the requirements included in German Eco-Tex Standard 100. The new dyes were mostly disperse and active dyes. Among others, there are 159 disperse dyes, 82 active dyes and 35 acid dyes. None of them contain 20 carcinogenic dyes banned by Germany. The new trend of research and development in the dye sector has also greatly advanced the research and development of new dyes in China.

The Chinese enterprises have also drawn on the experience of foreign enterprises in the environment management of the dye sector. Gaoqiao-Basf Disperse Dye Company Ltd. in Shanghai is now the first company in the dye sector to have passed the accreditation of EMS of ISO 14000. It is a good example for other dye companies in China. Their

experience indicates that strengthening environmental management should be an important target pursued by all the enterprises and an important means for the enterprises to increase their competitiveness in the world market.

After China's entry of WTO, trade liberalization will present an unprecedented opportunity of development for the textile industry of China. It is projected that by 2010, the foreign currency revenue from the textile product export of China will reach 80 to 100 billion USD, still taking a leading position in the world textile export. In this circumstance, for the textile dye sector, development is undoubtedly prospective. This also means a higher requirement for the dye sector development. For this, the dye sector in China must facilitate the product and sectoral restructuring, strengthen environment management of the enterprises and adopt sustainable development in order to achieve compatibility with international standards and increase international market shares.

#### **4.6 Policy Recommendations for Sustainable development of textile dyestuff in China**

- ***Reform the industry structures and optimize the products. Improve the environmental management of dye production, operation and utilization***

Concerning the sustainable development in China, textile dye industry must be regulated on production organization and products' structure. For adjusting the current assortment of dye products, first of all, we should continue to develop our traditional predominant products, encourage the manufacture of the products, which involve high technologies, or create additional values, or have high demanding market. On the other hand, we should initiate research/development of new products, especially focus on the products, which will be favorable and save for human health and environment. Also, we must eliminate the dye or intermediate which have already been banned in other countries. Chinese government had an explicit rule forbidding to produce or to distribute certain chemical products, such as *Benzidine*, which threads human physical condition.

In order to build a high quality and economical dye and intermediate production system, we have to put into effect the Government regulation to prevent low-grade plants producing poor quality products. We also need to prevent redundant dye manufacture installation and to pay attention to dye production geographic location.

For the reason of reinforcing the business management, small dye manufactures, which

produce less than 500-ton dye annually, must be shut down; those big or median size enterprises need to be monitored closely on “*three wastes*” (industrial wastes) control and harness.

**Textile dye sub-industry should set up a model for whole dye industry to accelerate itself restructuring, to extricate itself from a predicament. Textile dye manufactures should give up the old technologies and equipment, which are inefficient, wasting resources and severely polluting; should ban all small dye producing shops, in order to raise dye product quality level, to increase export. The management should practice clean production, carrying out Eco-Labeling and ISO14000 series standard inside of every enterprise, at the same time, to develop an environmental management system and to adjust the industry structure. This is a healthy circle of enduring development.**

- ***Adopt vigorous procedure to develop and produce domestic substitute dye material for environment protection and increase additional technical value of the products***

International environment consciousness, without any doubt, is a great pressure upon the relative laggard textile dye and textile printing, dyeing industries in China. How to turn the pressure into driving power for Chinese textile and dye industries gaining a big progress is an urgent task needed us to do more research and study.

**The research and development of dye substitutes have started in China, but there is still a big gap for meeting the various demands of domestic users. To research and develop the substitute is a complicated job. To do this, we need to reach and surpass the level of original dyes in terms of dye functions (color, process conditions, dyeing rate, fixing rate, evenness of dyeing and appearance), fixing functions, environmental requirements and price. Therefore, relevant scientific research institutions in textile and dyes sectors should strengthen their research and development of environmentally friendly substitutes. The government should increase investment to tackle key difficult technical problems. It should strengthen cooperation with foreign institutions and attract foreign investment and technology to promote domestic production of dye substitutes.**

There are a number of joint ventures in the textile and dye sectors in China already. Efforts should be made to expand the scale and the area of foreign investment. Special emphasis should be placed on encouraging environmentally friendly technologies and

products.

- *Expand attracting foreign investment, but be careful of importing foreign pollution.*

Drawing foreign investment is a new circumstance for economic reform and open market in China. From 1979 to 1991, China had totally attracted \$23.34 billion foreign investment. In 1993, one year alone, the foreign investment was \$27.515 billion. According to statistics, up to the end of August 1995, there were 238 international enterprises invested in Chinese Dye industry. At the 1996, the foreign investment had been used for 1046 textile dye projects in China. Overall, the strategy of using foreign capital has brought into play of Chinese economic development. Some international corporations have paid much attention to environment protection. While investing in Chinese textile dye business, these international enterprises also brought into China new technology and equipment of environment protection. We also have to notice that some foreign investors have transferred foreign pollution into China as well. There are several reasons to cause shifting pollution happened: a. Chinese environment protection law is somehow not as restrict as their own countries. b. In some area of China, local environment management systems have not fully established. c. Cost of harness and control pollution of old technologies is way too high in other countries than in China. Chinese government certain departments should pay a good deal of attention in this matter. Dye and textile printing are pollution concentrated industries, while we are drawing foreign investment into these areas, we should especially be engrossed in environment protection issue.

- *Strengthening law enforcement to prevent the production and use of harmful substances*

**Though laws and regulations were issued in China long ago for limiting the production and use of harmful substances, the enforcement was not satisfactory. Some producers and business people continue to produce and sell these banned dyes for pursuing high profits without caring about the human health and environmental protection. Doing so has not only affected seriously the health of employees and brought unnecessary losses to some dyeing and textile companies. Therefore we must strengthen the law enforcement and exercise effective supervision and management over the production, processing, sales and use of these banned dyes so as to prevent the production, sales and use of those banned dyes.**

- *Establishing a mechanism to monitor and public relevant information and strengthening international exchange and cooperation*

**There is a need to establish a mechanism to track and release information in foreign environmental standards and requirements to products including those of dyestuffs. Some relevant departments should closely watch for new development of environmental standards and requirements for various products including those for dyestuffs. If there are any new development and relevant information, they should be provided to related enterprises in a timely manner such as through the Internet or other channels. Related enterprises, especially export trading companies should be widely informed of relevant information. This will help raise their awareness of trade and environmental issues, timely make necessary adjustment for the industrial structure and avoid any possible risks and losses.**

In international exchanging, China should make it clear that sustainable development is a basic principle it pursues. This may enhance the understanding of the international community on China's efforts towards the integration of trade and environment. China should participate as much as possible in international coordination and negotiation aimed at harmonizing environmental standards and to obtain mutual recognition of environmental standards/requirements and ecolabelling environmental standards from as many countries as possible. China should actively contact foreign standard-setting organizations to obtain necessary and relevant information and technical assistance. Developing countries, China should be given a certain transitional period to implementing environmental standards before it can meet international standards.

- *Strengthening the capacity building to increase the environmental awareness and the understanding of trade and sustainable development*

**Despite the public environmental awareness is increased to some extent, some departments and companies lack necessary awareness and understanding of environmental issues and environment and trade issues. Their inadequate understanding of the increasingly stringent environmental requirements in other countries and the increasingly strong market competition has resulted in unnecessary losses for the companies and the country.**

Therefore we should increase the environmental awareness and the understanding of environment and trade issues through publicity, training and workshops and learning about the foreign experience and strengthening the exchange and cooperation with the foreign institutions.

## Chapter Five

### Promoting Trade in Organic Food and Sustainable Agriculture

Organic food is a kind of farm products which is affirmed by the organic food authority and accord with the organic food production standard, this kind of food is the real pollutant free, high quality and healthy food as well as the clean and beautiful eco-environment which organic farming brings to human being. In the production and process of this kind of food, the chemical fertilizers, pesticides, additives and growth adjustment agents are not allowed to be used.

#### 5.1 Reasons for China to develop organic foods

**1. It is the best way to integrate agricultural, social and economic development with environmental protection through development of organic food. It is also the inevitable result of performing the fundamental state policy of environmental protection.**

In 1998, the arable land per capita in China was 0.11 hectares and was only 43% of the world average. One-fifth of arable lands was polluted and 40% of the arable lands in arid and semi-arid areas was seriously degraded. In China, the agricultural land irrigated with wastewater was 3.618 million hectares, accounting for 7.3% of the total irrigated areas in the country and 9.96% of the land irrigated with surface water. China is one of the countries with seriously desertification. In 1997, the area of desertification reached 2.622 million sq. km, 27.4% of the territory, at present, the area of desertification increases annually by from 1000 sq. km in the past to 2460 sq. km; area of water and soil erosion reached 1.794 million sq. km, 18.69% of the territory. China's deteriorating ecological environment is caused by polluted environment, traditional and conventional ways of developing agriculture, and high growth of population.

China has abundant grassland resources with 390 million hectares of different types of grasslands, which is 40% of the territory. But the area of grassland per capita was only 0.33 hectares in 1998, which is one half of the world average. In recent years, because of over-use of grasslands, irresponsible cultivation and long-standing overgrazing, grassland area decreased gradually and the quality of grassland also declined year by year. Due to the decrease of coverage rate, the ability of grasslands to hold water and soil has decreased. At present, 90% of its grasslands have been degraded or in the process of degrading. Up to 130 million hectares are degraded to moderate or worse degree, increasing by 2 million hectares annually, the output of meat per hectare of grassland in China is only about 30% of the world average, and much

lower than the average of the developing countries<sup>1</sup>.

The development of organic agriculture, which combines environmental protection tightly with transforming traditional and conventional agriculture, is proved to be the best way to perform the fundamental state policy of environmental protection. It is also the very important way to modernize China's agriculture through development of organic foods and to combine economic efficiency with eco-environmental efficiency and social efficiency.

**2. The development of organic agriculture can promote the health of people, increase their living standards and quality. It can help many peasants in the middle and western parts of China get rid of poverty and thus lays environmental and physical foundations for the performance of the development strategy of western part of China.**

Owing to the serious environmental pollution, many people suffer from different kinds of diseases, Table 5-1 lists 10 major diseases which are related to the deteriorated environment and destroyed eco-system. The development of organic agriculture gets rid of chemical fertilizers and pesticide and other chemicals, create best environment and eco-system, thus can promote the health of people, increase their living standards and quality.

**Table 5-1 Death rate of 10 major diseases in urban and rural China, 1997**

Cause of death	As % of total death	
	Urban areas	Rural areas
<b>Total of 10 major diseases</b>	91.31	91.35
<b>Cerebrovascular</b>	22.28	17.35
<b>Malignant tumour</b>	21.66	16.36
<b>Heart trouble</b>	16.37	10.80
<b>Respiratory disease</b>	15.28	25.20
<b>Trauma and toxicosis</b>	6.52	11.13
<b>Digestive disease</b>	3.22	4.49
<b>Internal system, nutrition, metabolite and immunity</b>	2.51	1.79*
<b>Urinary disease</b>	1.51	1.47
<b>Mental disease</b>	1.12	1.40**
<b>Neuropathy</b>	0.84	1.36***

Notes: \*-new born baby disease; \*\*-infected disease(excluding pulmonary tuberculosis); \*\*\*- pulmonary

<sup>1</sup> China Environment Yearbook 1998, page 171.



tuberculosis.

Source: China Statistical Yearbook 1997, pages 732-733.

*Many people in the middle and western parts of China still live in very poor life. If following the model of developing township factories just like eastern part of China, the weak ecological environment of the west will be seriously destroyed and polluted. Table 5-2 shows that China has made some achievements in environmental protection, but the percentages of pollutants discharged by township factories have increased rapidly. Thus, it is the effective measures to develop organic food to help them both get rid of poverty and protect their environment well.*

**Table 5-2 Discharge of waste water, gas and solid wastes by industrial enterprises at town and township level, 1989-1997** Unit: 10000 tons

	1989	1995	1997
<b>Total volume of industrial waste water discharged</b>	2703945	2809943	2267174
<b>Discharged by town &amp; township enterprises</b>	183000	591000	383877
<b>COD</b>		1306.3	1073
<b>Discharged by town &amp; township enterprises</b>	155	536.3	407
<b>Total volume of sulphur dioxide emission</b>	1786	1846.1	1852
<b>Discharged by town &amp; township enterprises</b>	222	441.1	489
<b>Total volume of shoot emission</b>	1730	1687.5	1565
<b>Discharged by town &amp; township enterprises</b>	332	849.5	880
<b>Total volume of industrial dust emission</b>	1141	1964.2	1505
<b>Discharged by town &amp; township enterprises</b>	301	1325.2	957
<b>Total volume of industrial solid wastes discharged</b>	9165	20242	18412
<b>Discharged by town &amp; township enterprises</b>	3900	18000	16863

Sources: China Environment Yearbook 1998, pages 173, 256 and 563; China Environment Yearbook 1990, page 433; China Environment Yearbook 1992, page 180.

### **3. It is the best way to break through green barriers of foreign countries to China's exports of agricultural products.**

In order to protect the environment, especially to protect the health and life of people, plants and animals, many prohibited or restricted trade measures have been adopted in many international and regional conventions, agreements, laws and regulations at country level in the 80's and especially 90's. The so-called green barriers to trade have substantial effects on China's exports of food in general meaning. The green

barriers can be measured in broad sense, such as:

- 1) **Requirements to pesticide:** Many kinds of pesticides, such as DDT, BHC, have been prohibited to use. Almost all of the developed countries set up the strict standards of maximum remain of pesticides in food.
- 2) **Stipulating the maximum remains of veterinary medicines in food.**
- 3) **Requirements to the additives of foods and feed.**
- 4) **Requirements to the contents of heavy metals in food.**
- 5) **Laws and regulations on microbe pollution in food.**
- 6) **Laws and regulations on packaging of foods. On December 17,1998, the United States had special regulation on the imports of Chinese products with wooden packaging materials.**
- 7) **Laws and regulations on the quarantine to animals, plants and food.** Based on " detailed rules of implementing law on quarantine to plants", many China's fruits exported to Japan are prohibited, and based on " detailed rules of implementing law on prevention to infected diseases of household animals", China's exports of frozen meats of pig and goats to Japan have been prohibited. In 1996, European Union prohibited the exports of China's frozen broiler for the reason that China's quarantine and prevention system and quality guarantee system could not keep in line with those of European Union.
- 8) **Stipulations to the process of agricultural products and foods. Some countries not only ask for the process technology and equipment, but also the environment of the process sites, such as HACCP managing system of the United states.**

In recent years, the exports of many Chinese foods have been seriously affected by various kinds of green barriers adopted by the developed countries. Since 1995, the exports of China's food have been declining. Therefore, only the organic foods can satisfy all the requirements of green barriers. This is the very important factor for China to develop her own organic foods.

#### **4. The development of worldwide green consumerism provide very good opportunity and create new international market for the organic foods.**

In 1992, 5 units from 5 countries established International Federation of Agriculture Movements-

IFOAM. With 639 members from 101 countries and regions, IFOAM has made great contributions to the development of organic farming and food in recent 10 years especially in recent 5 years. Since then, international organic food market has been developing at tremendous speed.

As the rise of green consumerism and the typical advantages and nature of organic food, more and more consumers like to buy organic food, even at very high prices. Based on incomplete data, sales revenue of USA's organic food increased from US\$1.5 billion in 1992 to US\$4 billion in 1997. In 1998, it rose to US\$4.8 billion, and US\$6 billion in 1999. At present, 1/3 American has purchased organic food, 83% of consumers is considering to buy, almost all of the supermarket, chain stores are selling organic food. It is estimated the sales of organic food in USA will reach US\$47 billion in 2006. In Denmark, organic food accounts for 10% of the food market sales, 70% of the organic food sold through supermarkets. There are 400 kinds of organic food in the market. It is estimated that the market share of organic food will increase to 20% in 2001. In Germany, 5% of farms produce raw materials of organic food, the market share of organic food reached 5%. Almost all of the infant food are organic food. Organic food accounts for 7.8% of the food market of Switzerland. Organic food grows at 20% annually in France. In other western and northern European countries, there are 2-3% of farms in production of organic food. In 1991, EU established "Regulations on eco-farm and related agricultural products and food". The total sales of organic food reached 2.5 billion Mark in 1997. It is estimated that the sales revenue of organic food in EU market will increased to US\$57 billion in 2006. In Japan, the scale of organic food market reached 100 to 200 billion Yuan. In Australia, organic food accounts for 10% of the food market. In Singapore, the annual growth rate of organic food reaches 20%.

Organic food is more profitable. It is investigated that the prices of organic foods are 50-200% higher than the general foods, in USA, 50% higher, in EU and Japan, 50-150% higher; the producers' profits can be increased by 10-50%.

In 1997, the sale of world organic food was over US\$10 billion, accounted for 1% of the world food market. Many developed countries' sales increased by 20-50% annually. It is estimated that the sales of organic food in EU and USA market will reach over US\$100 billion, accounting for 6-10% of food market. Organic food has become one of the industries with the fastest growth rate and will continue keep the high growth rate. In the middle of the next century, organic food will replace the conventional food and play the main role in the world food market. At the same time, organic fertilizers, pesticides, packaging and other organic products, such as organic cotton, textiles, garments, furnishes, arts and crafts, flowers, ornaments, etc., will also grow at very high speed.

## **5.2 Development of China's organic foods and their export**

### **1. The born and development of China's organic food**

- 1) In 1984, University of China's Agriculture began to make research and development of eco-farming and organic food.
- 2) In 1988, Nanjing Environmental Sciences Research Institute of the National Environmental Protection Agency (NEPA, now called SEPA) began to make research to organic food, and took part in IFOAM in the same year.
- 3) On 9 October 1994, Organic Food Development Center (OFDC) of NEPA was established with purposes of promoting the development of organic farming and organic food production, combining environmental protection with agricultural development, improving rural environmental quality, constantly providing high quality and agricultural and sideline products without discharge of pollution to domestic and international markets, and increasing farmers' incomes especially those in impoverished areas. It is a professional organization specially in the research, development and certification of organic food. In this year, Organic Food Development Supervision Committee (OFDSC) and Organic Food Certification Committee (OFCC) were established for the purpose of strengthening the technical supervision of organic food production and certification. 8 products (tea, sesame, honeybee, fennel oil, pepper, anise, Chinese angelica, ginseng) were certified to be organic food by OFDC which establishes relationship with OCIA.
- 4) In 1995, OFDC registered the logo of China's organic food, published "managing method on organic (natural) food label (trial)" and "technical standards of producing and processing organic (natural) food". 20 products obtained the certifications of OCIA and 4 products obtained certifications of OFDC. OCIA established China Branch in OFDC, entrusted it on behalf of OCIA to inspect, examine, issue certificates and use of organic food logo registered by OCIA.
- 5) In 1996, the development of organic food made certain achievements:
  - Establishing 7 branches at provincial level (Yunnan, Heilongjiang, Liaoning, Shanxi, Hebei, Shandong, Inner Mongolia), setting up development offices in Chifeng of Inner Mongolia and Yuexi County of Anhui; through training, 15 persons obtained qualification of inspectors to organic food certification.
  - Operating pre-examination of organic food 30 times, 15 products obtained certification of

exports, 8 products obtained certification of domestic sales.

- Publishing Journal of " Organic Food Times" and holding many training, workshops and taking part in international exhibitions.
- Actively taking part in international cooperation and exchange: one person is approved as the member of Standard Committee of IFOAM; performing the "project of developing organic agriculture in China's poor regions" ( aided by German Government); Some certification organizations approved to acknowledge certification of OCIA in China; entrusted by Holland certification organization of organic food, OFDC made examination to anise in Vietnam; making investigation to development of organic food in the developed countries.
- Engaging in demonstration production of organic food and product research and development, such as organic fertilizers and small to middle scale of production, organic fruit and vegetables production research and comparison studies.

6) Many new achievements have been made in 1997:

- Establishing Qinghai and Hunan Branch centers,.
- 38 persons obtained the certifications of inspectors through twice training.
- More than 30 products obtained certifications of organic food.
- 13 enterprises and units have become the members of IFOAM; establishing state-owned China Environmental Organic (Natural) Food Co. Ltd. which mainly does business of organic food.

7) In 1998, more than 50 products obtained certifications of organic food.

So far, there are many international certification organization entered into China, such as Germany's Eco-cert( 30 products), BCS( 9 products), GFR( 1 product), the United States' OCIA ( 5 products) and OGBA( just into China in 1999), Holland's SKAL(2 products). There are about 50 products obtained certifications of organic food which output reach about 28000 tons and cover more than 20000 hectares of farm (see Table 5-3 and 5-4). There are 5 research institutes engaging in research of organic food, about 12 trading companies, more than 30 bases of organic food, 20 processing factories and 3 organic fertilizers factories in China.

**Table 5-3 The development of China's organic food**

	Quantity of products	Output (tons)*
<b>1994</b>	8	700
<b>1995</b>	24	3000
<b>1996</b>	25	4000

<b>1997</b>	33	6500
<b>1998</b>	50	28000

Notes: \*-estimated data.

Sources: China Environment Yearbook, 1995-1998 and other data.

**Table 5-4 The regional allocation and area of production of organic food** Unit: mu

<b>Province</b>	<b>Area of farm</b>	<b>Main products</b>
<b>Heilongjiang</b>	120,000	Soybeans, honeybee, melon seeds, rice,
<b>Liaoning</b>	50,000	Soybeans, melon seeds, rice, maize
<b>Hebei</b>	100,000	Soybeans, melon seeds, vegetables, rice
<b>Yunnan</b>	30,000	Soybeans, fennel oil, pepper, anise, melon seeds, buckwheat, walnut, Chinese chestnut
<b>Shanxi</b>	10,000	Watermelon, potato, tomato, pumpkin
<b>Jiangxi</b>	8000	Tea, sesame
<b>Zhejiang</b>	3000	Tea
<b>Shandong</b>	2500	Vegetables, peanut
<b>Henan</b>	2000	Sesame, ginkgo, traditional Chinese medicinal materials
<b>Inner Mongolia</b>	2000	Vegetables, traditional Chinese medicinal materials, buckwheat, wheat
<b>Fujian</b>	1000	Tea
<b>Jilin</b>	1000	Ginseng, glossy ganoderma, traditional Chinese medicinal materials
<b>Total</b>	329,500	

Notes: the data is estimated; 15mu =1 hectare.

Sources: Calculated on the base of interviews with experts, officials and businessmen.

## **2. Development of China's organic food export**

- 1) In 1990, Zhejiang exported organic tea to Holland.
- 2) In 1995, the export value of organic food reached US\$1 million, their export volume reached more than 2000 tons from Liaoning(300 tons of beans), Inner Mongolia(315 tons of traditional Chinese medicinal materials, 750 tons of buckwheat), Jilin(500 tons of traditional Chinese medicinal materials),

Henan( 100 tons of traditional Chinese medicinal materials), and Jiangxi(35 tons of sesame).

- 3) In 1996, the export value of organic food reached US\$3 million, 200% higher than last year, more than 10 provinces exported organic foods with about 15 products. Jiangxi exported organic tea to Germany, Liaoning exported organic bean to Japan.
- 4) In 1997, the export value of organic food increased to US\$7 million, 130% higher than last year, 30 products with certifications exported to Japan, the United States, Germany, Canada, Holland, France, etc..
- 5) In 1998, the export value of organic food increased to US\$9.8 million, 40% higher than last year. Table 5-5 shows that the biggest organic food exported is soybean, which reached US\$5 million, the second biggest product is vegetables, which reached US\$2.2 million; there are more than 57 production bases and export companies, 15 for vegetables, 12 for soybean. There are more than 50 products mainly exported to the United States, Japan, Canada, Germany, Holland, the United Kingdom, etc. The main export certification organizations are ECOCERT, OCIA, BCS, SKAL.

**Table 5-5 Exports of China's organic food in 1998**

Unit: US\$10,000

<b>Products</b>	<b>Production bases and exporting companies</b>	<b>Export Value</b>
<b>Tea( black tea, green tea)</b>	10	110
<b>Soybean</b>	12	500
<b>Rice</b>	6	50
<b>Other grain(Buckwheat, mung bean, etc.)</b>	10	90
<b>Vegetables</b>	15	220
<b>Traditional Chinese medicinal materials</b>	4	10
<b>Total</b>	57	980

Source: OFDC, China, on 30 March, 1999.

From the above, we find that the exports of China's organic food have following characteristics:

- China's exports of organic (natural) food are just in the beginning stage. The scale of export is still very small, but they increased at rapid speed. Most of China's imports and exports companies have not realized the importance of development of organic food.
- The organic foods are mainly exported to the developed countries, especially to Japan, the United States, Canada and some European Union countries.

- All of the certification organizations come from the developed countries, but most of them from European Union countries, especially Germany. So far, OFDC has not obtained the acknowledge from IFOAM.
- More than 16 provinces involve in production of organic food, but the provinces from the northern, middle and west parts of China are the main producers, such as Heilongjiang, Yunnan, Shanxi, Inner Mongolia, Liaoning, Hebei, Shandong. The most important provinces are Heilongjiang, Liaoning and Jilin(located in northern-east part of China) and Hebei.
- Almost all of the organic foods are export-oriented, Chinese domestic market accounted for very small percentage and has not been opened yet.
- Most of the organic foods are primary products, only few are manufactured products.

**3. Cost and benefit analysis shows that exports of China's organic foods are profitable both to producers and exporters.**

It is not very easy to make the cost and benefit of exporting organic food since varying products, producing positions, different regions, export situations, and so on. We just choose soybean which is produced free pollutants in certain part of China as an example. Assuming the purchasing price of the general soybean from the peasants is 2200 yuan RMB per ton, the purchasing price of organic soybean is 10% higher; the export price of organic soybean is FOB US\$560 China main ports, 35% higher than the general soybean; the cost and benefit can be listed in Table 5-6.

**Table 5-6 The cost and benefit comparison** unit: yuan RMB per ton

	<b>Peasant</b>	<b>Exporter</b>
<b>Cost</b>	1500	3710
<b>Selling price</b>	2310	4592*
<b>After-tax profit</b>	810	882
<b>Rate of profit(%)</b>	38.57	19.21

Notes: \*-exchange rate is US\$1=8.2 yuan RMB, and export price is FOB US\$560 China main ports.

From the Table 5-6, we find that if the peasant sells the general soybean, his after-tax profit is 600 yuan RMB per ton, rate of profit is 28.57%, if he sells the organic soybean, he will earn 810 yuan RMB per ton, rate of profit increases to 38.57%. As for export cost, besides the purchasing price, exporter has to pay various charges, such as charges of certification ( foreign certification charges US\$525 per day), inspection



fee( usually 6‰), port charges, loading and unloading fee, domestic transportation cost, storage fee, communication cost, wages, 13% of value-added taxes(draw backing 5%) and other charges. If the seller has not obtained export rights, or has to entrust big export corporations to export, he should paid more than 200 yuan RMB per ton as commission. Altogether, the export charges reach 1400 yuan RMB per ton (general speaking, 1200-1500 yuan). His after tax profit is 882 yuan RMB per ton, rate of profit reaches 19.21%(usually, between 15-20%). Thus, the production and exports of organic food is a good business, if invested in the processing and exports of organic foods, more profits will be earned.

#### **4. China's regulations on organic food development**

In 1995, OFDC issued "managing method on organic (natural) food label (trial)" and " technical standards of producing and processing organic(natural) food".

##### **1) Managing method on organic (natural) food label (trial)**

- The purpose of the method is to make the certification and label of organic (natural) food well done, guarantee the quality of the certified products, and protect the legitimate rights and interests of producers, processors, sellers and consumers of organic (natural) food.
- Organic (natural) foods mean all edible agricultural products and their by products, including grains, vegetables, fruits, aquatic products, stock and poultry, wild natural foods , and their processed products. These foods must satisfy " technical standards of producing and processing organic (natural) food" and be confirmed by certification organization of organic (natural) food. The label of organic (natural) food is used to prove the production, processing, storage, transportation, and marketing of the food be in conformity with " technical standards of producing and processing organic (natural) food".
- OFDC is in charge of the examination, approval and management to the label and certificate of the organic (natural) food, supervision of the use of label, publishing catalogue of organic (natural) food timely to the public.
- The certificate of organic (natural) food is valid for only one year.
- The method stipulates the details of application, examination, approval, use and supervision of label, appeal, punishment, and charges of applying for certificate and label.

##### **2)Technical standards of producing and processing organic (natural) food**

- These standards are established by OFDC which is entrusted by NEPA. They are set up on the base of IFOAM's basic standards of producing and processing organic food, in light of the standards of OCIA and other certification organizations in the developed countries, in combination with China's food

industry standards and the specific situation of organic (natural) food. They are the main standards of producing and processing organic (natural) food in China, as well as the important base of issuing certificates of organic (natural) food. These standards include: " organic (natural) food's processing technical standards "; " organic (natural) food's selling technical standards "; " organic (natural) food's storing technical standards "; " organic (natural) food's transportation technical standards "; " organic farming's transforming technical standards "; others being attached, such as: " the air environmental standards of production of organic farming"; " organic farming's farmland irrigation water quality standards" ; "water quality standards of organic fishery"; "potable water quality standards of organic stock and poultry"; "water quality standards of processing organic food"; " soil quality standards of production of organic farming"; " Catalogue of allowed, restricted and prohibited used materials in production of organic food".

##### **5. The problems existed in the development of China's organic foods exports**

- 1) Not so many people realize the important role and position of organic (natural) food in developing China's economy, making use of foreign capital, lessening the development gap between the coastal region and middle/western region of China, promoting the coordinating development between agriculture and environmental protection, and in upgrading China's exports of agricultural products and their by products, or developing a new export industry. Many people even do not know the definition of organic (natural) food. There are few reports in the Media.
- 2) There is not enough governmental supports to the development of organic (natural) food and their exports. At present, the shortage of capital and investment seriously restricts the development of organic (natural) food and their exports. There is no special regulations on encouraging the development of organic food.
- 3) There exist many systematic obstacles, such as: how to make coordination between SEPA and Ministry of Agriculture, between OFDC and China's Green Food Development Center; most of the producers and actual sellers of organic (natural) food do not have export rights, because exports of many agricultural products, such as tea, wheat, rice, soybean, maize need export quotas and licenses, and only several biggest import and export corporations can do these business, but they pay less attention to the export development of organic (natural) food, owing to its small scale and too complicate in operation so far. The sellers of some organic food have to ask the big export companies as their export agent, in fact they have to buy quotas from the companies, the cost may account for 5% of the export price. This is the very important factor which affect the export of organic food.

4) China has not established the development system of organic food, such as lacking of construction of big and constant production bases, big processing factories, supply of organic fertilizers, eco-pesticides, eco-package and storage, strong sellers with very good export channels, etc.. Most of the exported organic foods are primary products, the manufactured products only account for very small percentage. It is not easy for Chinese producers to obtain the certification of processing equipment and technology. There are many problems existed in construction of production bases of organic food, such as lacking of investment, poor management in some areas; contradictions between environmental protection authorities and agricultural bodies; lacking awareness and methodology of product life assessment; low educational quality of many people.

**5) The very important problem existed is weak marketing channels in export, since so many small and middle-size enterprises in this field.**

6) So far, the certification of OFDC has not been acknowledged by IFOAM and other developed countries, thus, exports of Chinese organic foods have to rely on the certification of authorities from the developed countries. OCIA's certification can only be acknowledged by several countries, such as United States, Japan and Canada. On 19 March 1998, IFOAM cancelled the qualification of OCIA, the role of OCIA in China is seriously affected. The costs of certification of the developed countries are too high, the procedures are too complicate, and It needs a long period of time from invitation of making inspection in China to receiving the certificates finally. Sometimes, there may exist some discriminatory treatment. It is said that although some Chinese organic foods satisfy the requirements and inspection of some famous certification organizations, 30% of them may be rejected deliberately for the reason of protecting the fame of the organizations!

### **5.3 The rapid development of China's green foods lay solid base for the future development of exports of China's organic foods**

#### **1. The born of green food**

In December 1989, in working out "the eighth-five-year plan and program to 2000", Department of Farm of Ministry of Agriculture designed to develop "food without social effects of pollution" as pillar product, later this kind of food has been named as green food. In May 1990, Ministry of Agriculture performed project of green food and established office of green food development, on 5 November 1992, China Green Food Development Center was set up. Logo of green food is consisted of three parts: sun in the up part, leaf in the lower part and bud in the middle; logo is a round, which means protection. The label of green food was registered as trade mark on 20 May 1991.

## 2. The development of green food

In 1990, 127 products were granted certification of green food; in 1996, the number of products increased to 289; up to the end of 1999, there were 1360 products of 742 enterprises were given certificates of green food. In 1998, GNP of green food reached 40.24 billion yuan RMB, 2.4% higher than last year; sales revenues reached 28.46 billion yuan, 18.3% higher, profit 1.68 billion yuan, increased by 28.4%(see Table 5-7); In 1999, output of them increased to 10 million tons covered 40 million mu,

**Table 5-7 Some indices of green food, 1997-1998**

Items	Unit	1997	1998
Number of enterprises		544	619
Number of workers and staffs	10000	31.3	48.9
GNP	100 million yuan	393.1	402.4
Sales revenues	100 million yuan	240.5	284.6
Profits	100 million yuan	13.1	16.8
Total assets	100 million yuan	171.1	240.6
Number of products		892	1016
Output	10000 tons	629.7	840.7
Total sown and raised area	10000 mus	3213	3385.5

Source: The annual statistics report on green food development, 1998.

From regional aspects, 30 provinces, municipals and autonomous regions of the mainland of China produce green food (see Table 5-8). The Eastern coastal regions have 269 enterprises, accounting for 43.46% of the national total, and 431 products, 42.34%, there are more than 50% of enterprises and products in the middle and western parts of China. The enterprises are allocated mainly in Heilongjiang, Inner Mongolia, Shandong, Beijing, Fujian, Jiangsu and Henan, and the products are produced mainly in Inner Mongolia, Heilongjiang, Shandong, Beijing, Fujian, Sichuan and Jilin.

**Table 5-8 Regional allocation of green food and enterprises, 1997-1998**

	Number of Enterprises		Number of products	
	1997	1998	1997	1998
Total	544	619	892	1018
Heilongjiang	94	70	136	96
Inner Mongolia	52	57	88	106
Beijing	45	47	85	89
Jiangsu	43	38	61	49

Shandong	43	50	61	89
Sichuan	19	18	60	67
Hebei	21	32	34	52
Xinjiang	25	26	33	35
Jilin	14	28	24	56
Liaoning	10	18	20	23
Tianjin	10	8	26	9
Shanxi	9	8	13	12
Fujian	17	44	31	70
Hunan	10	19	23	34
Shanghai	7	6	14	10
Qinghai	6	7	15	14
Gansu	6	4	12	5
Anhui	16	20	18	25
Guangdong	13	17	17	22
Zhejiang	2	4	2	7
Jiangxi	11	13	12	15
Henan	12	13	17	23
Hubei	6	17	8	25
Guangxi	8	4	14	4
Hainan	5	1	12	7
Chongqing	0	5	0	6
Guizhou	5	3	8	6
Yunnan	9	13	10	14
Xizang	1	3	1	6
Shanxi	20	19	29	35
Ningxia	5	7	8	10

Source: The annual statistics report on green food development, 1998.

From detailed products by sectors, in 1998, cereals & oils accounted for 21.51% of products, beverages 19.84%, poultry & eggs 14.83%; as for output, vegetables accounted for 39.11% of the total, cereals & oils 17.49% (see Table 5-9).

**Table 5-9 Green food by type of product and output, 1997-1998**

	Number of products		Output(10000 tons)	
	1997	1998	1997	1998

Total	892	1018	629.7	840.7
Cereals & oils	201	219	75.8	147.6
Vegetables	92	144	323.4	328.8
Fruits	123	129	71	38.6
Beverages	184	202	25.2	41.9
Poultry & eggs	128	151	22.1	34.7
Aquatic products	20	11	1.6	2.1
Wines	76	66	28.4	51.5
Others	68	96	82.3	195.4

Source: The annual statistics report on green food development, 1998.

From export point of view, in 1998, exports of green food increased to more than 725 million yuan RMB, 23.9% higher than last year, cereals & oils increased by 798%, vegetables by 28%, wines by 239.1%, but other produced decreased (see Table 5-10). In 1999, the export value of green food reached US\$200 million, or 1.65 billion yuan RMB, increased by 128.14%.

**Table 5-10 The exports of green food by sectors, 1997-1998** unit: 10000 yuan RMB

	1997	1998	Change %
Total	58526	72522.5	23.9
Cereals & oils	3171	28476.5	798
Rice	528	5261.5	896.5
Peanuts	2229	21400	860.1
Other food grains	414	1015	145.2
Vegetables	4220	5400	28
Fruits	5218.3	4861	-6.8
Beverages	1823.5	1800.5	-1.3
Teas	1310	1105	-15.6
Poultry & eggs	22360	19429	-13.1
Aquatic products	1890		
Wines	821	2784	239.1
Others	14541	9772	-32.8

Source: The annual statistics report on green food development, 1998.

**3. Many local governments listed development of green food into their local national economic plan and long term development program.**

- Qingan County of Heilongjiang:

In 1993, this county made up development strategy of green food. In 1994, only the development of green rice increased income by 28.5 million yuan RMB, per capita income of peasant increased by 100 yuan RMB and has been rising by 10% annually. The development of green food has resulted in spread effect of stabilizing grain output, promoting husbandry, pushing industries, making commerce active, making people rich and making the county strong. This county wants to build itself into the county of green food.

- Shandong Province

Shandong Province pays much more attention to development of green food. Up to the end of April, 1998, there were 88 products of 59 enterprises in 38 counties obtained the certificates of green food. The area of the raw materials of green food reached 1 million mu( 15 mu =1 hectare) with output of 160000 tons, 20000 tons of them were exported. This province plans to increase the percentage of sown area of green food to 5% in 2000(5 million mu), 10% in 2010(10 million mu).

#### **4. There are some differences between green food and organic food.**

General speaking, the standards of organic food are much higher than those of green food. Only these green food with AA grade can be equal to the same standards of organic food, or 22 of 1018 green foods can be called organic food. Nevertheless, the rapid development of green food has built very strong base for the future development of China's organic food.

### **5.4 Conclusions and recommendations**

#### **5.4.1 Conclusions**

There are many reasons for China to develop organic food, such as: it is the best way to integrate agricultural, social and economic development with environmental protection; it can promote the health of people, increase their living standards and quality, especially can help many peasants in the middle and western parts of China get rid of poverty and thus lays environmental and physical foundations for the performance of the development strategy of the west; it is also the effective way to break through the green barriers of the developed countries to exports of China's traditional foods; it can create a new international market with bright future and at very high growth rate. China has made some achievements in developing

and promoting organic food exports, but the development of organic food and their exports are still in beginning stage; many factors affect the development of organic food exports, such as low awareness, no encouragement of policies, systematic obstacles, lacking of capital, weak marketing channels, but the potentiality is huge, in next century, organic farming and organic food will dominate international market, China's organic food exports will be developed at very high speed.

#### **5.4.2 Recommendations of promoting the exports of China's organic food**

##### **1. China should establish organic food export development strategy**

- 1) MOFTEC, Ministry of Agriculture and SEPA must realize the importance of organic food exports from strategic aspect. The organic food stands for the direction of food development, exports of them can increase the multi-efficiencies( export, economic, eco-environment, social efficiencies), upgrade the level of China's food exports.
- 2) Building organic product development strategy: trying to transform China's traditional famous exporting foods into organic foods; upgrading the level of present green foods and bring up them into organic foods; developing Chinese own famous brand of organic food.
- 3) China should strengthen construction of organic food export bases: trying to make use of the present several hundreds of eco-demonstration plot zones and eco-farming counties; making use of foreign capital in construction of the bases, such as unilateral and bilateral official aids, favorable governmental and international loans, especially foreign direct investment.
- 4) China should set up green package strategy for the exports of organic food.

##### **2. Favorable policies should be provided to support the development of organic food exports.**

Development of organic food is a systematic engineering and high-tech, it is impossible for peasants to build a good base and make research.

- 1) Chinese government should provide favorable policies to the development of organic food, such as taxes deduction or free income tax, low or free interest loans.
- 2) A special fund should be established to support the development of organic food and their exports, and to provide guarantee to exporters and producers who want to borrow money from banks.



- 3) China Import and Export Bank should provide organic food the same position of electronic and machinery products to enjoy favorable export credit.
  - 4) Special policies should be provided to research and development of organic technology.
- 3. Establishing effective coordination mechanism among Ministry of Agriculture, SEPA and Ministry of Foreign Trade and Economic Cooperation, and other related governmental organizations. OFDC and China Green Food Development Center should be merged to form China Organic Food Development Center (COFDC).**
- 4. Establishing mechanism of international mutual recognition for the certification of organic food, bringing up good export channels for organic food.**

**Chapter Six**  
**Analysis of China's Current Policies and Regulations of**  
**Trade and Environment**

Foreign trade constitutes an important part of national economy of a country. As a component of its economic policy, the foreign trade policy of a country is determined by its national policy and works in a coordinated way together with other policies to promote the development of national economy.

With the establishment of ninth five-year plan and long-term program for 2010, China has proposed completing two fundamental transitions for achieving its goals identified in this plan and program. One is the transition in the economic system from the traditional planned economy to the socialist market economy and the other is the transition in the pattern of economic growth from coarse growth to intensive growth. As an important part of national economy, foreign trade must be geared to the changing needs of economic development arising from this new situation and shall follow the pattern of intensive growth and efficiency-oriented development.

*6.1 Analysis of the Relationship Between the Current Trade Policies and Regulations and Environmental Protection*

The foreign trade policy and regulations in China have provided directives for undertaking foreign economic cooperation and international trade and contributed to remarkable achievements in foreign economic cooperation and trade. They have promoted to some degree the development of environmental cause in China. However, the other side of coin is that they have exercised to some degree negative impacts on environment and ecology due to absence of environmental considerations in the current trade policy and regulations and lack of coordination between them and environmental policies. The foreign trade policy issue is one related to the economic system as a whole. So in a broader context of increasing green trade protectionism in the international trade and the trend of foreign trade development in China towards intensive growth, it is fairly necessary to have an analysis of the current trade policy and regulations in China in order to coordinate between the development of foreign trade and strengthening environmental protection, achieve the unity and upgrading of economic, social and environmental benefits and seek a road of the coordination and sustainable development of both trade

and environment.

## **1. The most updated policy and regulation of foreign trade in China**

The most recent foreign trade policy and regulations in China include:

- (1) **Quota, licensing and import management policy. This includes policies for active and passive quota for export, import management, license management, tendering for paid quota and foreign trade business operation.**
- (2) Policy for value-added tax and export tax exemption.
- (3) Policy for approval of right to operate foreign trade business. Upon authorization by the State Council, the Ministry of Foreign Trade and Economic Cooperation will exercise the monopolized management over the enterprises engaged in foreign trade. The relevant policies include those for approving the establishment of enterprises engaged in foreign trade business, for the production enterprises applying for the right to engage in import and export, for the enterprises engaged in commodity and material circulation applying for the right to engage in import and export, for the research institutions applying for the right to engage in import and export, for establishing local foreign trading companies and etc..
- (4) Policy for management system of foreign currency. The reform in the system of foreign currency management aims to establish a well-managed and market-based system of exchange rate adjustment and a regulated market for foreign currency exchange for gradually making Renminbi a convertible currency. The relevant policies include those for foreign currency exchange rate and management of foreign currency.
- (5) Policy for customs. China has for several times adjusted its policy for tariff reduction and exemption according to the changes in the economic development of China and the developments in international market.

## **2. China's Export Policy and Environmental Protection**

Like many other developing countries, China has also experienced a process in foreign trade which is characterized by export dominated by primary and raw products and increasing foreign currency revenue through expanding exports. This way of foreign currency accumulation has undoubtedly played an active role in promoting the industrialization process for a developing country in the early stage of economic

development in terms of introducing international advanced technology and equipment. However, it has also led to unplanned development and export of some products and over-exploitation of natural resources.

The long-standing reality of foreign trade in China has been that foreign trade has been for long oriented towards expanding export. It can be said that the foreign trade strategy before the 1980's was actually one to expand export through quantitative multiplication without consideration of or with little consideration of their impacts on environmental and natural resources. Guided by this strategy, China has exported a large quantity of mineral products, agricultural products and husbandry products, which leads to a series of serious consequences like sharp reduction of some mineral resources, soil quality decline of farmlands in some regions and prairie degradation.

Due to oil exploitation and export in a large quantity before the 1980's, the depletion of oil fields in eastern China has been accelerated. In the meanwhile, the internal demands for energy resources have been rising rapidly with economic and population growth and the internal oil production is far from meeting the needs of development of energy sector and petrochemical industry. To fill in this gap, China has to import oil from other countries in a large quantity in recent years. The oil import in 1996 amounted to 22.62 million tons while the oil export volume was 20.33 million tons. With this, China has joined in the countries with net import of oil, which is a potential threat to the sustainable development of China's economy.

An issue of over-exploitation of various degrees has arisen due to export of some nonferrous metals like wolfram, tin, molybdenum, antimony, rare-earth metals and other rare metals. Driven by the rising price of wolfram and tin in the international market a few years ago, some enterprises in China exploited wolfram and tin minerals. Some local small-size enterprises and township and village industrial enterprises (TVIEs) adopted rampant mining and exploitation without essential mining technologies and without obeying the national plan of mining, which makes the rate of mineral resources recovery only 20% or so and causes a very large waste of resources. For example, ten wolfram mines in Jiangxi Province, due to rampant mining and exploitation, lost 12,000 tons of wolfram in 1986, equal to one fourth of the world's wolfram output that year. At the same time, the damage of rampant mining also shortened the life of some wolfram mines in China. In Jiangxi Province, the life of eight mines was shortened by three to seven years and that of one mine by eleven years. In addition, a large quantity of hazardous or

radioactive substance was discharged in the traditional process of selection and smelting of these minerals, having resulted in the serious environmental pollution. And the vegetation and surface soil in the mining area were severely damaged by the rampant mining and felling, which led to hidden dangers of serious soil erosion and natural disasters.

Stone as building material can be exported for foreign currency, however, blind stone mining can cause damages to the environment and ecology. The most typical case is the rampant mining and export of stalactite in Guilin, which have severely damaged the rare tourism resources in Guilin. According to a statistics by Guilin Customs Authority, the export of stalactite from 1991 to February 1992 exceeded 32 tons. Apart from Seven-star Cave and Reed Flute Cave, it is very difficult to find undamaged limestone caves in Guilin.

The unplanned buying of some wild plants like Fa vegetable and wild mountain vegetable by some exporting companies in recent years led to a big rush of many farmers from Gansu and Ningxia into Inner Mongolia Prairie for rampant collection of such wild plants, which further accelerated the desertification of prairies in Alashan and Yikezhao Prefectures and seriously destroyed the local ecological environment. The export of licorice root faces a similar situation. As to the export of cashmere, the drastic expansion caused the over-grazing and the ecological damages. The unplanned pursuit of export expansion in this way has posed a serious threat to the sustainable development of agriculture and husbandry in China.

The production of a considerable number of finished or semi-finished products in the exports has brought serious pollution since some enterprises, in order to earn foreign currency revenue through export, have to produce and export some products which some developed countries are not willing to produce. As a result, products are exported to other countries but pollution is left at home.

In the past four decades and over, the excessive exploitation of natural resources at local levels has contaminated air, water and agricultural fields. We have paid a very costly price and should learn some lessons from it. The growth of material wealth is not equivalent to economic development since growth is limited but sustainable development should be a permanent goal. Therefore, to advance economy in China is not simply an issue of economic development, but also the coordination and development of the whole

society and the environment.

In addition, the environmental protection today has deeper and deeper influence on the international economy and trade. The more and more stringent environmental regulations of developed countries will have direct impact on or restrict the development of foreign trade of China. Whether in terms of self-requirement or from the general trend of international environmental protection, the economic development and foreign trade of China will face more difficult situation, if active measures are not adopted.

### **3. China's Import Policy and Environmental Protection**

The impacts of import policy on environment are determined by whether the policy formulation considers the environmental factors. Appropriate import policies are favor of environmental protection, otherwise, they will result in the consequences of environmental pollution and ecological destruction.

#### ***(1) Role of Import in Promoting Environmental Protection***

- a. The import of advanced international technology and equipment is favorable for pollution prevention and control and minimization of energy resources consumption.
- b. The suitable import of raw materials is favorable for protecting the natural resources and improving the environment.

Such as the import of paper pulp, paper, timber and veneer board, and etc. can reduce the depletion of limited forest resources in China and can help improve the ecological environment.

- c. The proper import of some products with high energy consumption and heavy pollution in production process contributes to the alleviation of resource and environmental pressures.

These products mainly refer to nonferrous metals, precious metals, rare metals, metal products, synthetic rubber, fertilizer, sulphate, sulphur, chemical raw materials, dyes and media agents, chemical fertilizers and leather products.

## ***(2) Negative Impacts of Import on Environmental Protection***

### **a. Import of wild animals and plants**

China imported for a certain period a considerable amount of elephant tusk, tiger bone, leopard bone, rhino horn and some wild animal products. Such imports were not favorable for biological diversity conservation in the exporting country. The trade of these products has been substantially limited or banned according to international environmental agreements and related provisions of national laws. However, since China has a long history of using these wild plants and animals as raw material for Chinese medicine or artistic products, the task is rather arduous for limiting or banning these products. Therefore, in this sense, there will be a formidable task for coordinating between the trade development and biodiversity conservation.

### **b. Import of ozone-depleting substances**

China has been taking various measures to reduce or substitute the use of ozone-depleting substances (ODS) through multilateral or bilateral cooperation after having ratified the Montreal Protocol and its London Amendment. According to the result of a recent survey, a considerably big amount of ODS has entered China in the name of imported materials for processing or supplementing old equipment. The import of these substances has added the difficulty in phasing out ODS in China and is not favorable for protecting the ozone layer.

### **c. Import of old ships**

The import of old ships for sales of scrap steel has been very popular in many coastal provinces of China. These old ships were imported mainly from USA, Japan, West Europe, Hong Kong and some other countries and regions. The ship disassembling in China is dominated by township and village enterprises. They usually operate in coastal or gulf areas and discharge the oily substances, rusty iron and electric welding pollutants into the beaches and seas. This not only causes heavy pollution to the marine areas and does great harm to the aqua-culture.

### **d. Import of waste**

Each year China needs to import 1.5 to 3 million tons of scrap steel, 1 million of aluminum, 1.8 million tons of scrap copper and 2 million tons of waste paper. The import of wastes, as raw materials, has some positive role in constructing China's economy. Firstly, the process and the reuse of waste materials are usually labor-intensive industries, which provide some job opportunities much needed in China. Secondly, the import can supplement the domestic needs for some raw materials. Thirdly, the import enables the enterprises to reduce their production cost. However, the other side of this import is negative. If it isn't well managed, the imported waste will bring pollution, even the entry of some unwanted foreign wastes. There are many reasons for import of foreign municipal waste, which are the incomplete regulatory system, loose enforcement and mismanagement as well as the inadequacy in the policy and regulation of import management. The import of waste has been managed as a common trading practice without the involvement and approval of the environmental authority. The import of waste for processing went through a simpler procedure just through accounting management. In October 1995, the State Council promulgated a urgent Notification on Strict Control of Transfer of Foreign Municipal Waste into China. And after a series of policies and regulations were issued for management of waste import, the system and means of waste import management were strengthened. The issue of import of foreign municipal waste was effectively controlled and the waste import has gradually been led onto a path of rule of law. For example, in 1996 only, more than 200 foreign ships, which intended to bring municipal waste into China, were refused out of the country. According to a statistics, from January to November, 1996, the commodity inspection departments approved about 21,000 cases of waste imports which weighed 2 million tons and were worth nearly 500 million USD. In the same period, they disapproved 250 cases which weighed 49,000 tons. In terms of weight, the rate of disapproval was 2.5%.

e. Import of backward technology

The problems brought by these technologies were not only high consumption of energy resources and raw materials but also the environmental pollution. Some imports of this kind are those technologies which have been already eliminated in the exporting countries and in fact some of them are backward even though they are for the time being better than domestic technologies. Therefore the technical assessment for such import is crucial in order to make sure that advanced technologies will be imported.

#### **4. Policy for Attracting Foreign Investment and Environmental Protection**



China has attracted and used a big amount of foreign investment since 1978. By the end of 1998, more than 31,000 foreign investing enterprises have been approved, with a contract investment being 554.9 billion USD. There has been a rapid growth in the number of foreign investing enterprises of various sectors. From 1978 to 1996, the amount of foreign investment used was accumulated to 253.2 billion USD. The growth of foreign investment has played a positive role in promoting the development of national economy. A considerable number of foreign investors have brought about active influence on the environmental protection in China.

***(1) Positive impact of foreign investment on environment***

- a. A large number of foreign companies have adopted proper environmental protection measures
- b. Many foreign companies reduce consumption of energy resources and raw materials through use of advanced technology and equipment
- c. Some foreign companies have developed environmental technologies and promoted cleaner production and comprehensive reutilization of wastes
- d. Some foreign companies have developed some green food and ecological products
- e. A number of foreign companies reduce the environmental pressure through import their raw materials from other countries, such as copper, nonferrous metals, petrochemical products, rubber products and paper pulp.

***(2) Some ways of using foreign direct investment unfavorable to environment***

- a. Transfer of ozone-depleting substances to China through foreign direct investment. Some foreign companies take advantage of the grace period between developed and developing countries in the international environmental agreement and the low awareness of this issue at the local level and the regulatory inadequacy in China to transfer to China in a large quantity the ozone-depleting substances and technologies and equipment using ODS.
- b. Transfer of pollution intensive enterprises to China through FDI. In recent years, due to the industrial restructuring at the global level, the conditions in the developed countries become increasingly unfavorable for pollution-intensive enterprises. This forces some of them to move out of the developed countries to the developing countries. Some foreign companies take advantage of the low level of environmental

standards in China to establish a group of pollution-intensive enterprises in China in order to evade the environmental regulations in their home countries and pursue high profits. According to a statistics in 1995, the number of pollution-intensive enterprises established in China by foreign companies has reached 16,998, with industrial output value reaching 415.3 billion yuan and 2.955 million people employed in these enterprises. The percentage of such enterprises in the total foreign companies is 30% or so. In terms of the investment sectors, the pollution-intensive enterprises are concentrated in the sectors of rubber, plastics, chemical production, chemical fiber production, tannery and dyeing. No doubt, most of these enterprises conform to environmental management regulations in China, but there are still some polluted enterprises.

- c. Transfer of old equipment to China through foreign investment. Some foreign companies transfer some old equipment to China as advanced technology by correcting date of production of, renovating or forging the equipment. The import of such polluting and energy-consuming equipment has caused negative impacts on the environment in China. According to a survey, 94 foreign companies have invested in the tannery, shoe-making and bamboo products manufacturing in Jiangxi Province and most of the equipment introduced for the above sectors are those old equipment eliminated in the exporting countries. Such equipment cannot meet the requirements of product quality and environmental indicators.

For long, China adopted a strategy for attracting foreign investment which gave much attention to speed and scale and economic benefits instead of their impacts on environment and environmental and social benefits. Some local officials purely used the level of foreign investment as a criterion for judging their performance and level of openness or only took foreign investment as an effective means to solve problems like employment, poverty alleviation and capital restraint, without consideration of the impacts on environment. Some local governments even adopted a preferential policy for attracting foreign companies to invest in polluting projects, only considering the present interest and ignoring the environmental development in long run.

In the directive for foreign investment, there is no clear limitation to the heavily polluting investment. Instead, some sectors even adopted the policy to encourage such an investment. This led to the establishment of many heavily polluting joint ventures in some areas in the sectors of tannery, dyeing, chemical production and plastics, etc..

In sum, not appropriate policies using of foreign investment might aggravate or have been increasing the China's environmental load. China's guiding contents of introducing foreign direct investment have began to pay attentions to such issues.

## *6.2 Analysis of Relationship between Existing Environmental Policy and Regulation and Trade Development*

China has formulated a system of environmental policy and regulations under the guidance of the principle of environmental protection as one of the basic national policies. A proper mechanism of operation has been established to implement these policies and regulations.

### **1. Basic principle for formulating environmental policy and regulations**

The most basic principles of China's environmental protection policies include:

- (1) principle of coordination between economic construction and environmental protection
- (2) precautionary principle and combination of prevention and control
- (3) principle of developer being responsible for conservation, and
- (4) principle of the polluters pay

### **2. Basic systems of environmental protection in China**

There are eleven environmental systems in China, including environmental impact assessment required for construction projects; simultaneous design, construction and operation of environmental infrastructure with other parts of the project; levying against pollution discharging, responsibility system for achieving environmental goal; quantitative examination and comprehensive improvement of urban environment; checking of pollutants discharged; integrated control of pollutants; giving deadline to cleaning up pollution; eliminating backward technical processes and equipment within a fixed time; administrative execution of hazardous waste disposal and total amount control of pollutants.

### **3. Environmental laws and regulations in China**

Up to now, China has established a system of environmental laws and regulations which is based on the Constitution of the People's Republic of China and the Law of Environmental Protection.

China has promulgated a number of environmental laws and related regulations for protection of natural resources, including Law of Water Pollution Prevention and Control, Law of Air Pollution Prevention and Control, Law of Solid Waste Prevention and Control, Law of Marine Environment Protection, Law of Noise Prevention and Control, Forestry Law, Grassland Law, Fishery Law, Mineral Resources Law, Land Management Law, Law of Wild Animal Protection, etc..

China has also formulated a number of environmental regulations, such as Regulation Concerning Nature Reserves, Provisional Regulation Concerning Water Pollution Prevention and Control in Huai River Basin, Regulation Concerning Water Pollution Prevention and Control in Tai Lake Basin, Regulation Concerning Environmental Management of Construction Projects, Provisional Regulation Concerning Environmental Management of Waste Import, Regulation Concerning Marine Dumping of Waste, Regulation Concerning Protection of Terrestrial Wild Animals and Regulation Concerning Urban Afforestation. In addition, relevant departments have promulgated a large number of administrative environmental regulations.

The local People's Congress and governments have formulated and issued more than 600 local environmental regulations to enforce the national environmental laws and regulations with due consideration to their own situation.

Environmental standard is an important part of the environmental regulatory system in China, which includes environmental quality standard, pollutant discharging standard, environmental infrastructure standard, sample standard and methodology standard. There are national and local standards for environmental quality standard and pollutant discharging standard. By the end of 1996, China has issued 395 national environmental standards of various categories.

#### **4. Impacts of environmental policy and regulations on economy and foreign trade**

##### ***(1) Influence of environmental policy and regulations on economic development***

It is found through analysis of nearly 300 environmental laws, regulations, rules, decisions, notifications and rules for implementation issued from 1974 to March, 1997 that the provisions in 93 pieces of such legal documents, totaling 548 articles, were likely to increase the economic costs of the enterprises, accounting for one third of the total number of articles in these legal documents. These articles include the provisions of giving fines, collecting pollution levies and criminal penalty against firms' economic activities which pollute the environment and damage the ecology and natural resources. These measures included are relatively high but reasonable requirements for the firms' economic activities. They, if adopted, would control effectively the environmental pollution and ecological damages.

If no attention is given to the environmental protection in the process of economic development, we will pay a higher price if we wait until ecological or environmental damages are done, with some losses resulting from this unrecoverable. Therefore, our social and economic development should be based on industrial prioritization and coordinated development of economy, society and environment. Facts show that the faster the economy grows, the bigger waste of natural resources and more serious damages done to the environment and ecology and the lower sustainability of economic development if the economic growth is based on unplanned expansion of investment. Definitely this should be avoided. The economic advancement should not be at the expense of environment and natural resources, but all along adhere to the basis of sound environmental and ecological cycle so that the development be sound and sustainable.

Some environmental policies and regulations were formulated in the context of planned economy, so the formulation of many policies and regulations was compatible with the system of planned economy. To meet needs of the development of social market economy, it's necessary make some related adjustments to the system of China's environmental policies and regulations.

## ***(2) Influence of environmental policy and regulations on export***

### **a. Positive influence**

- The environmental policy and regulations in China encourage the export of green products. For example, at present the development of green and organic food is widely undertaken across the country and a group of green and organic food

production bases have been established in some places. Green food has become a pillar project of eco-agriculture in China, which also plays an active role in alleviating the poverty in those remote and minority-resided areas.

- China formulated its Country Program and nine sectors strategies for phasing out ozone-depleting substances after having ratified the Vienna Convention for Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete Ozone Layer and its London Amendment. The substitution and phaseout of ODS has been undertaken nationwide since then. In this process, China has phased out a big number of backward production processes and ODS. Due to adoption of advanced technologies and ODS substitutes in the production process of domestic refrigeration sector, the green refrigerators made in China has quickly entered the international market, which changed the unfavorable situation of the domestic refrigeration sector in China.
- It is more than two years since China has promoted the accreditation of environmental management system domestically, according to series standards of ISO 14000. By the end of 1998, 82 enterprises have passed the accreditation of ISO 14000, like a green passport of international market. With this green passport, the products of those accredited enterprises enjoy strong competitiveness in the international market.
- Environmental labels are a symbol of green products. Under the situation that the environmental awareness of international consumers has been commonly improved, one important condition for access to international markets is that environmentally labeled products meet consumers' demands of environmental protection. China began to carry out the system of environmental labeling in 1994, has formulated a series of related documents, such as "Provisional Charter of Committee for Accrediting Environmentally-labeled Products", "Provisional Rules for Accrediting Environmentally-labeled Products" and "Provisional Regulation Concerning Use of Certificate of Environmentally-labeled Products and Environmental Labels", and has issued 29 technical demands for environmentally labeled products. The number of products getting environmental labels has been up to 328.

#### b. Negative impact

The compliance with the requirements incorporated in the environmental policy and regulations may lead to an increase in the environmental cost of enterprises and thus influence the competitiveness. However, there is a small percentage of exported products

whose environmental costs have been internalized. According to analysis of current known situations, there is no obvious evidence to prove that the increase in environmental cost will have obvious impacts on the export of products.

The enforcement of the regulation for protecting wild plants and animals has limited and banned the import and export of many wild plants and animals and their products. For example, for implementation of CITES, the State Council has issued “Notification on Ban on Trade of Rhino Corns and Tiger Bones”(May 29, 1993) which required a ban on sales, collection, transportation, delivery, postal delivery and trade of rhino corns and tiger bones and the cancellation of standards for medical use of rhino corns and tiger bones. This notification was a destructive crackdown on the production and trade of these products and led to a direct economic loss of 200 million yuan. In addition, as required by this convention, the artificially reproduced endangered animals will be strictly limited or banned for export. The most affected by this notification is Northeast China Tiger Reproduction Center in Hengdaohezi, which is the only one center in China as well as the world for Northeast China tiger reproduction. As a result of their efforts, the number of tigers has grown from 8 to nearly 100. The investors in this center originally planned to raise funds for tiger protection through increasing tiger population, but the ban enforcement threw this center into a serious economic crisis. The alternative this center opted for is to transfer some tigers to a garden near Harbin to allow tigers to live in a semi-natural state and tourists to enjoy them so that the income from this can compensate to some extent for the losses in the center.

### ***(3) Influence of Environmental Policy and Regulations on Import***

The directive for import in the environmental policy and regulations of China is to encourage the import of those advanced technologies and products with low or no pollution and low consumption of energy and materials in order to prevent or ban the import of those technologies, equipment and products which affects or will potentially affect the environment and ecosystems in China.

The limitation to waste import has effectively controlled the trend of entry of foreign municipal waste into China and avoided the environmental pollution and ecological damages resulting from hazardous wastes. Though procedures for waste import are made more complicated and a certain amount of fees collected as result of this limitation, it will eventually prove to be good to the environmental protection and ecological conservation

in China.

The enforcement of the regulations for protecting wild plants and animals has limited and even banned the import of many wild plants and animals and their products. For example, after China acceded CITES, which is a convention on banning ivories trade, the traditional ivory sculpture suffered a heavy blow. More than 100 factories making the ivory sculpture have been closed down and thousands of workers unemployed. The export of such artistic products is also banned which generate an annual foreign currency revenue of nearly one hundred thousand US dollars.

#### ***(4) Influence of Environmental Policy and Regulations on Attracting Foreign Investment***

The environmental policy and regulations of China are in general loose compared with those of the developed countries. Most of those foreign investors can meet the environmental requirements of China. However, the environmental policy and regulations of China play some role in limiting those foreign companies which adopt loose environmental requirements. According to a survey, a considerable number of companies, some from developing as well as developed countries and some from Hong Kong, Macao and Taiwan, transfer the pollution to China to make profits through FDI by taking advantage of the loose environmental regulations and standards in China. For these companies, the environmental policy and regulations are still playing roles of managing and limiting the environment management rules of environmental impact assessment and simultaneous design, construction and operation of environmental infrastructure with other parts of the project apply to the approval of establishment of joint ventures and foreign-invested companies in China. Therefore, strengthening the environmental requirements in the environmental policy and regulations for foreign-invested companies is the key of coordinating environmental policies and foreign direct investment policies.

China's export policies played an important role in expanding export and increasing foreign exchange income and laid a good economic foundation for strengthening environmental protection from the macro view. However, due to the existing tendency of over emphasis of expanding the export and earning foreign exchange as the major goal and without fully considering the potential impacts of such export policies on the environment and resources, the resource depletion and environmental pollution has been caused. The paper gives out some examples on mineral resources development,



agricultural and animal husbandry development, textile industry and leather industry.

China's import policies play an important role in promoting those products with heavy pollution, high energy consumption and high material consumption in their production processes and the import of advanced technology and equipment to decline energy and raw material consumption, to prevent pollution, to reduce waste discharge, and to protect resources and environment. However, the management of import of wild animals and plants, ODS, old ships, wastes and backward technologies lacked the effective coordination between environmental policies and trade policies, which resulted in the environmental pollution, increased the environmental pressures and posed some unfavorable influences on the implementation of internationally environmental treaties.

Due to China's FDI policies have paid attention to introducing technologies with lower energy and material consumption and clean production technologies and developing green products, which play a role in reducing environmental pressures and promoting the development of advanced environmental technologies. However, in the process of using FDI, the condition that foreign investors transferred polluted enterprises and obsolete equipment resulted in the consequence of environmental pollution.

The conflicts between foreign trade policies and environmental protection policies are the guidance of inappropriate foreign trade policies caused the destruction of resources and the environment and increased the ecological pressures in China. China's foreign trade policies must seek a road---sustainable development road of foreign trade, which will not cause the ecological pressures, but can promote the development of foreign trade.

China's environmental protection policies and regulations play an important role in protecting China's ecological environment. The limitation and punishment to economic activities harmful to the environment, including some trade activities, might increase the cost of products. But from the view of sustainable development, these instruments are necessary and favorable to China's sustainable development. However, there are not enough and effective coordination between the environmental policies and foreign trade policies for this aspect.

## **Chapter Six**

### **Policy Option for Trade and Sustainable Development**

In order to address existing conflicts between trade policy and environmental policies, a sustainable development strategy of foreign trade must be established. The formulation of the strategy is the key content of suggestions on coordination between trade and environmental policies and regulations. This chapter discusses the general strategy, concrete contents and measures of sustainable development strategy of foreign trade.

Under the principles of sustainable development, the development of foreign trade should not destroy the natural resources and pollute the environment while keeping the development of foreign trade. On the contrary, the development of foreign trade should make some contributions to promoting the natural resources protection and the environmental protection and should promote the transition from the following traditional development pattern to the intensively sustainable development pattern.

The foreign trade should take the sustainable development as the guiding ideology and its policies and regulations should be enriched and adjusted, including improving the policies and regulations of export, import and FDI, speeding up the legislation of Package Law and adjusting trade policies and regulations with the constant change of environmental situation at home and abroad. The concrete contents and measures include establishing the sustainable structure of export goods, adjusting the structure of import goods, strengthening the management of FDI, closing up the internationally “green measures” like ISO 14000, eco-labeling, green products (or food), green package and clean production, strengthening the environmental management of foreign trade enterprises and establishing the coordination mechanism between foreign trade and environmental protection system.

With the establishment and constant improvement of China’s market economy system, some provisions of environmental and resource protection policies and regulations formulated under the planned economy system have not been able to meet the needs of new system and are necessary to be modified and improved further. Environmental policies and regulations should coordinate with the trade development, embody the international obligations to be implemented by China and comprehensively consider the environmental impacts of trade activities and the environmental internalization.

To strengthen the international cooperation in the field of environment and trade is the important approach for China to understand the world, seek the international support and strengthen the information exchange.

China is now at the stage of quick economic development. The important issue facing with us is how to coordinate the economic development and environmental protection in order to realize the sustainable development. The foreign trade and the environmental protection not only promote each other, but also restrict each other. To reach the goal of promoting each other, the key is to coordinate the trade policies and environmental policies under principles of sustainable development.

#### ***7.1 Recommendations for Formulating Strategy for Sustainable Development of Foreign Trade***

To better guide the development of foreign trade by the principle of sustainable development, it is recommended that relevant departments should consider formulating the Strategy for Sustainable Development of Foreign Trade, which should cover the master strategy, content and measures for sustainable development of foreign trade.

### **1. Overall strategy**

#### ***(1) To identify the guiding principle for sustainable development of foreign trade***

The development of foreign trade guided by the principle of sustainable development should be that the environment will not be polluted or ecology damaged while maintaining the growth of foreign trade. Instead foreign trade should make its contribution to promoting the protection of environment and the conservation of natural resources and ecological environment. This means, a transition will be made from the traditional non-sustainable development pattern to the intensive sustainable development pattern.

- a. Conscientiously carry out the environmental protection as one of fundamentally national policies and develop the comprehensive benefits of foreign trade, including economic, social and environmental benefits. In formulating the strategy for foreign trade development, various aspects of foreign trading activities should be systematically considered and planned to integrate import and export, use of foreign

- loans, foreign grants, attracting foreign direct investment or external direct investment, project contracting and labor export, tourism and transportation with environmental protection and ecological conservation so that they will be mutually supportive and promoting and make active contribution to the sustainable development of national economy.
- b. The concept of unilaterally pursuit of scale and speed should be changed in an effort to seek the scale and speed of foreign trade development in coordination with the sustainable development.
  - c. Progress in technology should be relied on in great efforts to control and mitigate the negative impacts of foreign trade on environment and ecology.
  - d. The products should take the quality as the core element. In the current whole life cycle of products, trying to reduce or avoid the unfavorable influence on ecology and environment has become the important connotation of product quality. This means, the product quality has been expanded to PPM and the stage after consumption and disposal. Therefore, attentions must be paid to implementing the environmental management in the quality management.

## ***(2) Improvement and adjustment of foreign trade policy and regulations***

Market economy can operate with rule of law. The environmental management rules for managing foreign trade must be improved as soon as possible so as to establish and improve a system of environment-related foreign trade regulations. The transparency and seriousness of policies and regulations must be maintained so that they will be seriously enforced.

### *a. To adjust foreign trade policy and regulations in China as required by the principle of sustainable development*

#### **(a) Export policy and regulations**

In formulating export policy and regulation, one-sided emphasis should not be given to foreign currency revenue generation through export and export should not be expanded at the expense of natural resources and environment of China. Attention should be given to restructuring exported products, upgrading environmental requirements, PPM and the environmental policy and requirements of the importing country. In the meanwhile, attention should be also given to international standards and measures. Doing so will

promote the transition of production pattern towards the direction favorable for environment and ecology. The disorderly development or competition for short-term or local interests by destroying the ecology and polluting the environment should not be allowed absolutely.

(b) Import policy and regulations

In formulating import policy and regulations, the import of the commodities shall not be allowed which will do harm to the environment and ecological resources in China. The advanced technologies and methods of management will be introduced. Adequate attention should be paid to the effective deployment and supplementation of natural resources in China. The import of hazardous wastes should be supervised. It should be clearly put forward in related policies of foreign trade and customs that the import of equipment and products should not pose any threat to the environmental quality and human health, otherwise, they are prohibited from being imported.

(c) Policy and regulations for attracting foreign investment

While formulating the policy and regulations for attracting foreign investment, national guiding industrial policies should be carried out seriously and not allow the import of those industries and technologies which will do harm to the environment and ecological resources in China. The relative departments should be careful in approving such imports by establishing relevant responsibility system. The approval of establishment of foreign companies in China should involve the environmental protection departments.

(d) Speed up the process of legislation for packaging

In recent years, there are many problems in foreign trade due to the package. Those problems show that the old package, which can not meet standards of environmental protection, will become the barrier of developing foreign trade in China. To meet the requirements for green packaging in the international trade, the formulation of Packaging Law and relevant policies should be accelerated and a system of green packaging established in China.

*b. Adjust China's foreign trade policy and regulations as required by changing domestic and international environmental situation*

We should pay close attention to the international developments in environment and trade, consider adjusting China's foreign trade policy and regulations accordingly guided by the principle of sustainable development and formulate the corresponding countermeasure.

## **2. Content and Measures**

In formulating the content and measures in the strategy for sustainable development of foreign trade, the following aspects should be taken into consideration.

### ***(1) To establish a structure of exported commodities for sustainable development***

- a. The share of primary products in the exported commodities should be further decreased.

Considering the need to protect the environment and natural resources, the export of primary products should be reduced or limited which do damage to the natural resources and have low added values. Those export goods directly derived from the natural resources should upgrade the depth of processing and increase the technological content and value-added.

- b. The energetic development and expansion of green product export

As environmental protection strikes root in the hearts of the people, the green products will strong competitiveness and attractiveness in the future international market. This is a global trend of commodity development. Therefore, the government authorities should formulate a preferential policy for environmentally friendly industries in terms of policy and investment and encourage the export of green products and China's trading companies to participate in the international competition for green products market so that the share of green products from China in the international trade could increase.

### ***(2) Adjust structure of imported commodities***

The imports should serve the purposes of economic construction. The import should be focused on those internationally advanced technologies or equipment which cannot be produced in China or whose supply is not sufficient in China.

- a. To introduce actively international advanced technologies for environmental protection and cleaner production

The proper environmentally friendly technologies and equipment should be actively introduced to promote the enterprises adopting the cleaner production processes, minimize the consumption of energy resources and materials and try to eliminate the pollution in the whole production process. To ensure that the imported technology is advanced, relevant experts should be organized to undertake technical assessment of the imported technology, which will be the basis of approving its import.

- b. To further control the import of environmentally harmful products

The import of hazardous industrial and municipal wastes will be banned. The government regulations provide the import of those wastes, which can be used as raw materials, should go through a stringent approval procedure. The enterprises to use waste for processing or reproduction must have the treatment facilities suitable for the standards of environmental protection and should be supervised by the local customs and environmental authorities.

- c. The trade of wild animals and plants prohibited in the international environmental conventions will be strictly controlled

### ***(3) Strengthen management of projects using foreign investment***

Attracting foreign investment serves China's economic construction and is an important part of our policy of opening to the outside world and reform. Due to the big population, the limited capital accumulation and relatively backward technology, using foreign investment, in particular FDI, will not only supplement the capital shortage for construction but also bring advanced technology, new equipment and advanced management experience. This is of help to upgrading the industrial structure and product structure, increasing the competitiveness of domestic companies and strengthening the capacity to generate foreign currency revenue.

To lead the foreign investment and the establishment of joint ventures towards the direction favorable for environmental protection, regulations of environmental protection

must be strictly implemented in project approval and management. The preferential policy will be given to those companies giving emphasis to environmental protection while those enterprises not suitable for industrial policies and environmental requirements will be vetoed in order to prevent the pollution from entering China. The management of special economic zones, technology development zones, high tech development zones and economically open zones, where foreign companies concentrate should be strengthened and be built into demonstration zones for sustainable development.

***(4) Learning about “green measures”***

In recent years, there appears internationally green measures favorable for environmental measures. They play a very good role in promoting corporate management and developing free trade. We should learn, draw upon, and accept those green measures taking into consideration our own reality. Those green measures include ISO 14000 series standards, eco-labeling, active development of green products, green packaging and cleaner production and etc..

***(5) Strengthen environmental management of export-oriented enterprises***

What should be considered is the following:

- a. strengthening the environmental awareness of managers and employees
- b. a good environmental decision making by management
- c. creating an environmental image
- d. encouraging enterprises to apply the accreditation of ISO 14000 series standards

***(6) Paying close attention to trends in international policy for environment and trade***

WTO and relevant meetings of international environmental conventions are important forums on issues of environment and trade and have important influence on international policy for environment and trade. WTO is devoted to promoting trade liberalization. However, in the past decade and over, increasing attention has been given to environmental issues. It is recommended that we should actively participate in international activities related to environment and trade, which help to know about the latest international trend, present position and views of China and developing countries and safeguard China’s interests.



***(7) To establish a mechanism to coordinate environmental protection and foreign trade***

Since much coordination is needed for environmental and trading policies and regulations, so it is necessary to establish a mechanism of coordination between the Ministry of Foreign Economic Cooperation and Trade and the State Environmental Protection Administration so that they can often communicate their information and undertake consultation, study and coordination as necessary.

***7.2 Recommendations for Adjusting and Supplementing Environmental Policy and Regulations***

Despite considerable progress is made in the environmental legislation and a system of environmental policy and regulations is formed, they need to be improved as the market economic system is established because some of them were formulated in the context of planned economy and prove unsuitable for the new system. Therefore, there is a need to speed up the legislation so as to establish a system of environmental policy and regulations suitable for the market economy.

**1. The environmental policies and regulations should embody China's international obligations under the international environmental instruments**

In recent years China ratified a number of international environmental agreements. The essential spirit and principles in these instruments and China's obligations under them should be reflected in the environmental policy and regulations of China, in particular the Environmental Protection Law.

**2. The environmental policy and regulations should pay attention to the environmental impacts probably caused by trade policy direction**

Seen from the analysis in chapter two, we can find that misleading direction of trade policy has posed significantly unfavorable influence on China's ecology and environment. In aspects of environmental management and restricted measures, most environmental policy and regulations in China stress the environmental impacts caused by economic activities such as the industrial and agricultural production and the communications and transportation, seldom consider environmental impacts of trade activities and also lack the control measures against trade activities. While formulating or modifying environmental policy and

regulations in the future, we should consider the environmental management of trade activities. These control measures against import and export activities aren't and shouldn't limit the development of trade, but should further prevent the trade activities from destroying ecology and increasing ecological load.

### **3. The environmental policy and regulations should consider the issue of environmental cost internalization**

In theory, environmental cost internalization is a fundamental way to address the issues of environment and trade. Some experts, domestic and international, have different views on this. One view is that the rate of environmental cost is a small percentage, at most 20% or so, of the product cost and thus the cost internalization will not have substantial impacts on the competitiveness of products. However, the other view is that if the environmental cost is completely internalized, the enterprises will be closed down and the complete internalization of environmental cost is almost impossible.

To solve this problem, it is recommended that relevant departments should organize studies on the issue of environmental cost internalization. For example, what percentage of environmental cost to be internalized will enable the realization of protecting or recovering the environment and to what capacity China can bear the environmental costs, the time table for achieving the cost internalization, making a comparison between developing and developed countries in terms of environmental cost internalization and the basic requirements for cost internalization in international trade.

### **7.3 Recommendations for Strengthening International Cooperation**

The foreign trade departments should work closely with the environmental protection departments and participate actively in international cooperation and exchange.

1. Many existing internationally environmental conventions involve trade measures and take them as important instruments to reach their environmental goals. Therefore, foreign trade departments should actively coordinate with environmental departments to jointly participate negotiations concerning international environmental law chaired by related international organization in order to deal with the relation between trade and environment and to defend China's interests.
2. The provisions in the related international environmental agreements should be used and the grants or preferential loans from bilateral, multilateral and non-governmental

sources should be fully used to strive for the import of advanced environmental technologies in fair and preferential terms so as to upgrade the level of environmental management and technological level. The international environmental conventions should be used to prevent and crack down on the transfer of pollution.

3. The cooperation with some developed countries and international organization should be promoted to establish sustainable development zones of foreign trade in China and sum up experiences to find out experiences for the sustainable development of foreign trade.
4. The cooperation with the developed countries, international organizations and non-governmental organizations should be promoted to attract their support and assistance to enhance the personnel exchange and environmental education in foreign trade.
5. The international cooperation and exchange should be undertaken on research areas and international financial and technical assistance obtained for support the studies, information exchange and training in the field of environment and trade.

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